

GDCM

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## Chapter 1

# GDCM Documentation

This is the developpers documentation.

A PDF version of this doxygen documentation can be found here:

`http://gdcm.sourceforge.net/3.0/gdcm-3.0.21.pdf`

A tarball version of this HTML doxygen documentation can be found here:

`http://gdcm.sourceforge.net/3.0/gdcm-3.0.21-doc.tar.gz`

**Author**

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## Chapter 2

# Todo List

### Class `gdcm::CSAHeader`

MrEvaProtocol in 29,1020 contains ^M that would be nice to get rid of on UNIX system...

### Class `gdcm::network::ApplicationContext`

Looks like Application Context can only be 64 bytes at max (see Figure 9-1 / PS 3.8 - 2009 )

### Class `gdcm::Overlay`

Is there actually any way to recognize an overlay ? On images with multiple overlay I do not see any way to differentiate them (other than the group tag).

### Class `gdcm::SequenceOfFragments`

I do not enforce that Sequence of Fragments ends with a SQ end del

### Class `gdcm::TransferSyntax`

: The implementation is completely retarded -> see `gdcm::UIDs` for a replacement We need: IsSupported We need preprocess of raw/xml file We need GetFullName()

### Member `gdcm::UIDGenerator::IsValid (const char *uid)`

: Move that in DataStructureAndEncoding (see `FileMetaInformation::CheckFileMetaInformation`)



## Chapter 3

# Deprecated List

Member [gdcm::CompositeNetworkFunctions::ConstructQuery](#) (ERootType inRootType, EQueryLevel inQueryLevel, const KeyValuePairArrayType &keys, EQueryType queryType=eFind)

Member [gdcm::FileSet::AddFile](#) (File const &)

. Does nothing

Member [gdcm::TransferSyntax::GetSwapCode](#) () const

Return the [SwapCode](#) associated with the Transfer Syntax. Be careful with the special GE private syntax the [DataSet](#) is written in little endian but the Pixel Data is in Big Endian.



## Chapter 4

# Bug List

### Class `gdcm::DICOMDIRGenerator`

: There is a current limitation of not handling Referenced SOP Class UID / Referenced SOP Instance UID simply because the `Scanner` does not allow us See PS 3.11 / [Table D.3-2 STD-GEN Additional DICOMDIR Keys](#)

### Member `gdcm::FileStreamer::StartGroupDataElement` (`const PrivateTag &pt`, `size_t maxsize=0`, `uint8_t startoffset=0`)

`maxsize` should be a value lower than the actual total size of the buffer to be copied

### Class `gdcm::IPPSorter`

There are currently a couple of bugs in this implementation:



## Chapter 5

# Namespace Index

### 5.1 Namespace List

Here is a list of all namespaces with brief descriptions:

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## Chapter 6

# Hierarchical Index

### 6.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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## Chapter 9

# Namespace Documentation

### 9.1 gdcmm Namespace Reference

#### Namespaces

- namespace [network](#)
- namespace [SegmentHelper](#)
- namespace [terminal](#)

*Class for Terminal.*

#### Classes

- class [AbortEvent](#)
- class [AnonymizeEvent](#)  
*AnonymizeEvent.*
- class [Anonymizer](#)  
*Anonymizer.*
- class [AnyEvent](#)
- class [ApplicationEntity](#)  
*ApplicationEntity.*
- class [ASN1](#)  
*Class for ASN1.*
- class [Attribute](#)  
*Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.*
- class [Attribute< Group, Element, TVR, VM::VM1 >](#)
- class [Attribute< Group, Element, TVR, VM::VM1\\_3 >](#)
- class [Attribute< Group, Element, TVR, VM::VM1\\_8 >](#)
- class [Attribute< Group, Element, TVR, VM::VM1\\_n >](#)
- class [Attribute< Group, Element, TVR, VM::VM2\\_2n >](#)
- class [Attribute< Group, Element, TVR, VM::VM2\\_n >](#)
- class [Attribute< Group, Element, TVR, VM::VM3\\_3n >](#)

- class [Attribute< Group, Element, TVR, VM::VM3\\_n >](#)
- class [AudioCodec](#)  
*AudioCodec.*
- class [Base64](#)  
*Class for Base64.*
- class [BaseQuery](#)  
*BaseQuery.*
- class [BaseRootQuery](#)  
*BaseRootQuery.*
- class [BasicOffsetTable](#)  
*Class to represent a BasicOffsetTable.*
- class [Bitmap](#)  
*Bitmap class.*
- class [BitmapToBitmapFilter](#)  
*BitmapToBitmapFilter class.*
- class [BoxRegion](#)  
*Class for manipulation box region.*
- class [ByteBuffer](#)  
*ByteBuffer.*
- class [ByteSwap](#)  
*ByteSwap.*
- class [ByteSwapFilter](#)  
*ByteSwapFilter.*
- class [ByteValue](#)  
*Class to represent binary value (array of bytes)*
- class [CAPICryptoFactory](#)
- class [CAPICryptographicMessageSyntax](#)
- class [Cleaner](#)  
*Cleaner.*
- class [Codec](#)  
*Codec class.*
- class [Coder](#)  
*Coder.*
- class [CodeString](#)  
*CodeString.*
- class [Command](#)  
*Command superclass for callback/observer methods.*
- class [CommandDataSet](#)  
*Class to represent a Command DataSet.*
- class [CompositeNetworkFunctions](#)  
*Composite Network Functions.*
- class [ConstCharWrapper](#)  
*Do not use me.*
- class [CP246ExplicitDataElement](#)  
*Class to read/write a DataElement as CP246Explicit Data Element.*
- class [CryptoFactory](#)  
*Class to do handle the crypto factory.*

- class [CryptographicMessageSyntax](#)
- class [CSAElement](#)
  - Class to represent a CSA [Element](#).*
- class [CSAHeader](#)
  - Class for [CSAHeader](#).*
- class [CSAHeaderDict](#)
  - Class to represent a map of [CSAHeaderDictEntry](#).*
- class [CSAHeaderDictEntry](#)
  - Class to represent an Entry in the [Dict](#).*
- class [CSAHeaderDictException](#)
- class [Curve](#)
  - [Curve](#) class to handle element 50xx,3000 [Curve](#) Data.*
- class [DataElement](#)
  - Class to represent a Data [Element](#) either Implicit or Explicit.*
- class [DataElementException](#)
- class [DataEvent](#)
  - [DataEvent](#).*
- class [DataSet](#)
  - Class to represent a Data Set (which contains Data Elements)*
- class [DataSetEvent](#)
  - [DataSetEvent](#).*
- class [DataSetHelper](#)
  - [DataSetHelper](#) (internal class, not intended for user level)*
- class [Decoder](#)
  - [Decoder](#).*
- class [DefinedTerms](#)
  - Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.*
- class [Defs](#)
  - FIXME I do not like the name '[Defs](#)'.*
- class [DeltaEncodingCodec](#)
  - [DeltaEncodingCodec](#) compression used by some private vendor.*
- class [DICOMDIR](#)
  - [DICOMDIR](#) class.*
- class [DICOMDIRGenerator](#)
  - [DICOMDIRGenerator](#) class.*
- class [Dict](#)
  - Class to represent a map of [DictEntry](#).*
- class [DictConverter](#)
  - Class to convert a .dic file into something else:*
- class [DictEntry](#)
  - Class to represent an Entry in the [Dict](#).*
- class [DictPrinter](#)

- DictPrinter* class.
- class [Dicts](#)
  - Class to manipulate the sum of knowledge (all the dict user load)*
- class [DirectionCosines](#)
  - class to handle [DirectionCosines](#)*
- class [Directory](#)
  - Class for manipulation directories.*
- class [DirectoryHelper](#)
  - [DirectoryHelper](#).*
- class [DPath](#)
  - class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation <https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA>*
- class [DummyValueGenerator](#)
  - Class for generating dummy value.*
- class [Dumper](#)
  - [Codec](#) class.*
- class [Element](#)
  - [Element](#) class.*
- class [Element< TVR, VM::VM1\\_2 >](#)
- class [Element< TVR, VM::VM1\\_n >](#)
- class [Element< TVR, VM::VM2\\_2n >](#)
- class [Element< TVR, VM::VM2\\_n >](#)
- class [Element< TVR, VM::VM3\\_3n >](#)
- class [Element< TVR, VM::VM3\\_4 >](#)
- class [Element< TVR, VM::VM3\\_n >](#)
- class [Element< VR::AS, VM::VM5 >](#)
- class [Element< VR::OB, VM::VM1 >](#)
- class [Element< VR::OW, VM::VM1 >](#)
- class [ElementDisableCombinations](#)
  - A class which is used to produce compile errors for an invalid combination of template parameters.*
- class [ElementDisableCombinations< VR::OB, VM::VM1\\_n >](#)
- class [ElementDisableCombinations< VR::OW, VM::VM1\\_n >](#)
- class [EmptyMaskGenerator](#)
  - [EmptyMaskGenerator](#) Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.*
- class [EncapsulatedDocument](#)
  - [EncapsulatedDocument](#).*
- class [EncodingImplementation](#)
  - [EncodingImplementation](#).*
- class [EncodingImplementation< VR::VRASCII >](#)
- class [EncodingImplementation< VR::VRBINARY >](#)
- class [EndEvent](#)
- class [EnumeratedValues](#)
  - [Element](#). A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:*
- class [EquipmentManufacturer](#)
- class [Event](#)

*superclass for callback/observer methods*

- class [Exception](#)  
*Exception.*
- class [ExitEvent](#)
- class [ExplicitDataElement](#)  
*Class to read/write a [DataElement](#) as Explicit Data [Element](#).*
- class [ExplicitImplicitDataElement](#)  
*Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).*
- class [Fiducials](#)  
*Fiducials.*
- class [File](#)  
*a DICOM File*
- class [FileAnonymizer](#)  
*FileAnonymizer.*
- class [FileChangeTransferSyntax](#)  
*FileChangeTransferSyntax.*
- class [FileDecompressLookupTable](#)  
*FileDecompressLookupTable class.*
- class [FileDerivation](#)  
*FileDerivation class.*
- class [FileExplicitFilter](#)  
*FileExplicitFilter class.*
- class [FileMetaInformation](#)  
*Class to represent a [File](#) Meta Information.*
- class [Filename](#)  
*Class to manipulate file name's.*
- class [FileNameEvent](#)  
*FileNameEvent.*
- class [FilenameGenerator](#)  
*FilenameGenerator.*
- class [FileSet](#)
- class [FileStreamer](#)  
*FileStreamer.*
- class [FileWithName](#)  
*FileWithName.*
- class [FindPatientRootQuery](#)  
*PatientRootQuery.*
- class [FindStudyRootQuery](#)  
*FindStudyRootQuery.*
- class [Fragment](#)  
*Class to represent a [Fragment](#).*
- class [Global](#)  
*Global.*
- class [GroupDict](#)  
*Class to represent the mapping from group number to its abbreviation and name.*
- class [IconImageFilter](#)  
*IconImageFilter.*

- class [IconImageGenerator](#)  
*IconImageGenerator.*
- struct [ignore\\_char](#)
- class [Image](#)  
*Image.*
- class [ImageApplyLookupTable](#)  
*ImageApplyLookupTable* class.
- class [ImageChangePhotometricInterpretation](#)  
*ImageChangePhotometricInterpretation* class.
- class [ImageChangePlanarConfiguration](#)  
*ImageChangePlanarConfiguration* class.
- class [ImageChangeTransferSyntax](#)  
*ImageChangeTransferSyntax* class.
- class [ImageCodec](#)  
*ImageCodec.*
- class [ImageConverter](#)  
*Image* Converter.
- class [ImageFragmentSplitter](#)  
*ImageFragmentSplitter* class.
- class [ImageHelper](#)  
*ImageHelper* (internal class, not intended for user level)
- class [ImageReader](#)  
*ImageReader.*
- class [ImageRegionReader](#)  
*ImageRegionReader.*
- class [ImageToImageFilter](#)  
*ImageToImageFilter* class.
- class [ImageWriter](#)  
*ImageWriter.*
- class [ImplicitDataElement](#)  
Class to represent an Implicit [VR](#) Data [Element](#).
- class [InitializeEvent](#)
- class [IOD](#)  
Class for representing a [IOD](#).
- class [IODEntry](#)  
Class for representing a [IODEntry](#).
- class [IODs](#)  
Class for representing a [IODs](#).
- class [IPPSorter](#)  
*IPPSorter.*
- class [Item](#)  
Class to represent an [Item](#).
- class [IterationEvent](#)
- class [JPEG12Codec](#)  
Class to do JPEG 12bits (lossy & lossless)
- class [JPEG16Codec](#)  
Class to do JPEG 16bits (lossless)

- class [JPEG2000Codec](#)  
*Class to do JPEG 2000.*
- class [JPEG8Codec](#)  
*Class to do JPEG 8bits (lossy & lossless)*
- class [JPEGCodec](#)  
*JPEG codec.*
- class [JPEGLSCodec](#)  
*JPEG-LS.*
- class [JSON](#)
- class [KAKADUCodec](#)  
*KAKADUCodec.*
- class [LO](#)  
*LO.*
- class [LookupTable](#)  
*LookupTable class.*
- class [Macro](#)  
*Class for representing a [Macro](#).*
- class [Macros](#)  
*Class for representing a [Modules](#).*
- class [MD5](#)  
*Class for [MD5](#).*
- class [MEC\\_MR3](#)  
*Class for [MEC\\_MR3](#).*
- class [MediaStorage](#)  
*MediaStorage.*
- class [MemberCommand](#)  
*Command subclass that calls a pointer to a member function.*
- class [MeshPrimitive](#)  
*This class defines surface mesh primitives.*
- class [ModalityPerformedProcedureStepCreateQuery](#)  
*ModalityPerformedProcedureStepCreateQuery.*
- class [ModalityPerformedProcedureStepSetQuery](#)  
*ModalityPerformedProcedureStepSetQuery.*
- class [ModifiedEvent](#)
- class [Module](#)  
*Class for representing a [Module](#).*
- class [ModuleEntry](#)  
*Class for representing a [ModuleEntry](#).*
- class [Modules](#)  
*Class for representing a [Modules](#).*
- class [MovePatientRootQuery](#)  
*MovePatientRootQuery.*
- class [MoveStudyRootQuery](#)  
*MoveStudyRootQuery.*
- class [MrProtocol](#)  
*Class for [MrProtocol](#).*
- class [NestedModuleEntries](#)

Class for representing a *NestedModuleEntries*.

- class [NoEvent](#)

- class [NormalizedNetworkFunctions](#)

*Normalized Network Functions.*

- class [Object](#)

*Object.*

- class [OpenSSLCryptoFactory](#)

- class [OpenSSLCryptographicMessageSyntax](#)

- class [OpenSSLP7CryptoFactory](#)

- class [OpenSSLP7CryptographicMessageSyntax](#)

- class [Orientation](#)

*class to handle Orientation*

- class [Overlay](#)

*Overlay class.*

- class [ParseException](#)

*ParseException* Standard exception handling object.

- class [Parser](#)

*Parser* ala XML\_Parser from expat (SAX)

- class [Patient](#)

*See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.*

- class [PDBElement](#)

*Class to represent a PDB Element.*

- class [PDBHeader](#)

*Class for PDBHeader.*

- class [PDFCodec](#)

*PDFCodec class.*

- class [PersonName](#)

*PersonName class.*

- class [PGXCodec](#)

*Class to do PGX.*

- class [PhotometricInterpretation](#)

*Class to represent an PhotometricInterpretation.*

- class [PixelFormat](#)

*PixelFormat.*

- class [Pixmap](#)

*Pixmap class.*

- class [PixmapReader](#)

*PixmapReader.*

- class [PixmapToPixmapFilter](#)

*PixmapToPixmapFilter class.*

- class [PixmapWriter](#)

*PixmapWriter.*

- class [PNMCodec](#)

*Class to do PNM.*

- class [Preamble](#)

*DICOM Preamble (Part 10)*

- class [PresentationContext](#)



- *PresentationContext.*
- class [PresentationContextGenerator](#)
  - *PresentationContextGenerator.*
- class [Printer](#)
  - *Printer class.*
- class [PrivateDict](#)
  - *Private Dict.*
- class [PrivateTag](#)
  - *Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#), Owner)*
- class [ProgressEvent](#)
  - *ProgressEvent.*
- class [PVRGCodec](#)
  - *PVRGCodec.*
- class [PythonFilter](#)
  - *PythonFilter [PythonFilter](#) is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.*
- class [QueryBase](#)
  - *QueryBase.*
- class [QueryFactory](#)
  - *QueryFactory.h.*
- class [QueryImage](#)
  - *QueryImage.*
- class [QueryPatient](#)
  - *QueryPatient.*
- class [QuerySeries](#)
  - *QuerySeries.*
- class [QueryStudy](#)
  - *QueryStudy.h.*
- class [RAWCodec](#)
  - *RAWCodec class.*
- class [Reader](#)
  - *Reader ala DOM (Document [Object](#) Model)*
- struct [RealWorldValueMappingContent](#)
- class [Region](#)
  - *Class for manipulation region.*
- class [Rescaler](#)
  - *Rescale class.*
- class [RLECodec](#)
  - *Class to do RLE.*
- class [Scanner](#)
  - *Scanner.*
- class [Scanner2](#)
  - *Scanner2.*
- class [Segment](#)
  - *This class defines a segment.*
- class [SegmentedPaletteColorLookupTable](#)
  - *SegmentedPaletteColorLookupTable class.*

- class [SegmentReader](#)  
*This class defines a segment reader.*
- class [SegmentWriter](#)  
*This class defines a segment writer.*
- class [SequenceOfFragments](#)  
*Class to represent a Sequence Of Fragments.*
- class [SequenceOfItems](#)  
*Class to represent a Sequence Of Items.*
- class [SerieHelper](#)  
*[SerieHelper](#) DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.*
- class [Series](#)  
*[Series](#).*
- class [ServiceClassUser](#)  
*[ServiceClassUser](#).*
- class [SHA1](#)  
*Class for [SHA1](#).*
- class [SimpleMemberCommand](#)  
*[Command](#) subclass that calls a pointer to a member function.*
- class [SimpleSubjectWatcher](#)  
*[SimpleSubjectWatcher](#).*
- class [SmartPointer](#)  
*Class for Smart Pointer.*
- class [SOPClassUIDToIOD](#)  
*Class convert a class SOP Class UID into [IOD](#).*
- class [Sorter](#)  
*[Sorter](#).*
- class [Spacing](#)  
*Class for [Spacing](#).*
- class [Spectroscopy](#)  
*[Spectroscopy](#) class.*
- class [SplitMosaicFilter](#)  
*[SplitMosaicFilter](#) class.*
- class [StartEvent](#)
- struct [static\\_assert\\_test](#)
- struct [STATIC\\_ASSERTION\\_FAILURE](#)
- struct [STATIC\\_ASSERTION\\_FAILURE< true >](#)
- class [StreamImageReader](#)  
*[StreamImageReader](#).*
- class [StreamImageWriter](#)  
*[StreamImageReader](#).*
- class [StrictScanner](#)  
*[StrictScanner](#).*
- class [StrictScanner2](#)  
*[StrictScanner2](#).*
- class [String](#)  
*[String](#).*

- class [StringFilter](#)  
*StringFilter.*
- class [Study](#)  
*Study.*
- class [Subject](#)  
*Subject.*
- class [Surface](#)  
*This class defines a SURFACE IE.*
- class [SurfaceHelper](#)  
*SurfaceHelper.*
- class [SurfaceReader](#)  
*This class defines a SURFACE IE reader.*
- class [SurfaceWriter](#)  
*This class defines a SURFACE IE writer.*
- class [SwapCode](#)  
*SwapCode representation.*
- class [SwapperDoOp](#)
- class [SwapperNoOp](#)
- class [System](#)  
*Class to do system operation.*
- class [Table](#)  
*Table.*
- class [TableEntry](#)  
*TableEntry.*
- class [TableReader](#)  
*Class for representing a [TableReader](#).*
- class [Tag](#)  
*Class to represent a DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#)).*
- class [TagPath](#)  
*class to handle a path of tag.*
- class [Testing](#)  
*class for testing*
- class [Trace](#)  
*Trace.*
- class [TransferSyntax](#)  
*Class to manipulate Transfer Syntax.*
- class [Type](#)  
*Type.*
- struct [UI](#)
- class [UIDGenerator](#)  
*Class for generating unique UID.*
- class [UIDs](#)  
*all known uids*
- class [UNExplicitDataElement](#)  
*Class to read/write a [DataElement](#) as UNExplicit Data [Element](#).*
- class [UNExplicitImplicitDataElement](#)  
*Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).*

- class [Unpacker12Bits](#)  
*Pack/Unpack 12 bits pixel into 16bits.*
- class [Usage](#)  
*Usage.*
- class [UserEvent](#)
- class [UUIDGenerator](#)  
*Class for generating unique UUID.*
- class [Validate](#)  
*Validate class.*
- class [Value](#)  
*Class to represent the value of a Data [Element](#).*
- class [ValueIO](#)  
*Class to dispatch template calls.*
- class [Version](#)  
*major/minor and build version*
- class [VL](#)  
*Value Length.*
- class [VM](#)  
*Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.*
- struct [VMToLength](#)
- class [VR](#)  
*VR class.*
- class [VR16ExplicitDataElement](#)  
*Class to read/write a [DataElement](#) as Explicit Data [Element](#).*
- struct [VRToEncoding](#)
- struct [VRToType](#)
- class [VRVLSize](#)
- class [VRVLSize< 0 >](#)
- class [VRVLSize< 1 >](#)
- class [Waveform](#)  
*Waveform class.*
- class [WLMFindQuery](#)  
*PatientRootQuery.*
- class [Writer](#)  
*Writer ala DOM (Document [Object](#) Model)*
- class [XMLDictReader](#)  
*Class for representing a [XMLDictReader](#).*
- class [XMLPrinter](#)
- class [XMLPrivateDictReader](#)  
*Class for representing a [XMLPrivateDictReader](#).*

## Typedefs

- typedef [String](#)<"\", 16 > [AECComp](#)
- typedef [String](#)<"\", 64 > [ASComp](#)
- typedef bool(\* [BOOL\\_FUNCTION\\_PFILE\\_PFILE\\_POINTER](#)) ([File](#) \*, [File](#) \*)
- typedef [String](#)<"\", 16 > [CSCComp](#)
- typedef [String](#)<"\", 64 > [DACComp](#)
- typedef [String](#)<"\", 64 > [DTComp](#)
- typedef std::vector< [SmartPointer](#)< [FileWithName](#) > > [FileList](#)
- typedef [Bitmap](#) [IconImage](#)
- typedef [String](#)<"\", 64 > [LOComp](#)
- typedef [String](#)<"\", 64 > [LTComp](#)
- typedef [ModuleEntry](#) [MacroEntry](#)
- typedef [NestedModuleEntries](#) [NestedMacroEntries](#)
- typedef [String](#)<"\", 64 > [PNComp](#)
- typedef [String](#)<"\", 64 > [SHComp](#)
- typedef [String](#)<"\", 64 > [STComp](#)
- typedef [String](#)<"\", 16 > [TMComp](#)
- typedef [String](#)<"\", 4294967294 > [UCCComp](#)
- typedef [String](#)<"\", 64, 0 > [UICComp](#)
- typedef [String](#)<"\", 4294967294 > [URComp](#)
- typedef [String](#)<"\", 64 > [UTCComp](#)

## Enumerations

- enum [CompOperators](#) {  
[GDCM\\_EQUAL](#) = 0 ,  
[GDCM\\_DIFFERENT](#) ,  
[GDCM\\_GREATER](#) ,  
[GDCM\\_GREATEROREQUAL](#) ,  
[GDCM\\_LESS](#) ,  
[GDCM\\_LESSCOREQUAL](#) }
- enum [ECharSet](#) {  
[eLatin1](#) = 0 ,  
[eLatin2](#) ,  
[eLatin3](#) ,  
[eLatin4](#) ,  
[eCyrillic](#) ,  
[eArabic](#) ,  
[eGreek](#) ,  
[eHebrew](#) ,  
[eLatin5](#) ,  
[eJapanese](#) ,  
[eThai](#) ,  
[eJapaneseKanjiMultibyte](#) ,  
[eJapaneseSupplementaryKanjiMultibyte](#) ,  
[eKoreanHangulHanjaMultibyte](#) ,  
[eUTF8](#) ,  
[eGB18030](#) }
- enum [ENQueryType](#) {  
[eCreateMMPS](#) = 0 ,  
[eSetMMPS](#) }

- enum [EQueryLevel](#) {  
[ePatient](#) = 0 ,  
[eStudy](#) = 1 ,  
[eSeries](#) = 2 ,  
[eImage](#) = 3 }
- enum [EQueryType](#) {  
[eFind](#) = 0 ,  
[eMove](#) ,  
[eWLMFind](#) }
- enum [ERootType](#) {  
[ePatientRootType](#) ,  
[eStudyRootType](#) }
- enum [LodModeType](#) {  
[LD\\_ALL](#) = 0x00000000 ,  
[LD\\_NOSEQ](#) = 0x00000001 ,  
[LD\\_NOSHADOW](#) = 0x00000002 ,  
[LD\\_NOSHADOWSEQ](#) = 0x00000004 }

## Functions

- static int [add1](#) (char \*buf, int n)
- [ignore\\_char](#) const [backslash](#) ('\\')
- template<typename T >  
static T [Clamp](#) (int v)
- static void [clean](#) (char \*mant)
- static int [doround](#) (char \*buf, unsigned int n)
- [VR::VRType](#) [GetVRFromTag](#) ([Tag](#) const &tag)
- bool [operator!=](#) (const [CodeString](#) &ref, const [CodeString](#) &cs)
- bool [operator!=](#) (const [DataElement](#) &lhs, const [DataElement](#) &rhs)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [GroupDict](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [IOD](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODEntry](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODs](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macro](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macros](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [MediaStorage](#) &ms)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Module](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [ModuleEntry](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Modules](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [NestedModuleEntries](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Tag](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [TransferSyntax](#) &ts)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Type](#) &val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [UI](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [UIDs](#) &uid)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Usage](#) &val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [VM](#) &\_val)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [VR](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [BasicOffsetTable](#) &val)
- std::ostream & [operator<<](#) (std::ostream &os, const [CodeString](#) &str)
- std::ostream & [operator<<](#) (std::ostream &os, const [CommandDataSet](#) &val)

- `std::ostream & operator<< (std::ostream &os, const CSAElement &val)`
  - `std::ostream & operator<< (std::ostream &os, const CSAHeader &d)`
  - `std::ostream & operator<< (std::ostream &os, const CSAHeaderDict &val)`
  - `std::ostream & operator<< (std::ostream &os, const CSAHeaderDictEntry &val)`
  - `std::ostream & operator<< (std::ostream &os, const DataElement &val)`
  - `std::ostream & operator<< (std::ostream &os, const DataSet &val)`
  - `std::ostream & operator<< (std::ostream &os, const Dict &val)`
  - `std::ostream & operator<< (std::ostream &os, const DictEntry &val)`
  - `std::ostream & operator<< (std::ostream &os, const Dicts &d)`
  - `std::ostream & operator<< (std::ostream &os, const Directory &d)`
  - `std::ostream & operator<< (std::ostream &os, const DPath &val)`
  - `std::ostream & operator<< (std::ostream &os, const File &val)`
  - `std::ostream & operator<< (std::ostream &os, const FileMetaInformation &val)`
  - `std::ostream & operator<< (std::ostream &os, const FileSet &f)`
  - `std::ostream & operator<< (std::ostream &os, const Fragment &val)`
  - `std::ostream & operator<< (std::ostream &os, const Global &g)`
  - `std::ostream & operator<< (std::ostream &os, const Item &val)`
  - `std::ostream & operator<< (std::ostream &os, const MrProtocol &d)`
  - `std::ostream & operator<< (std::ostream &os, const Object &obj)`
  - `std::ostream & operator<< (std::ostream &os, const Orientation &o)`
  - `std::ostream & operator<< (std::ostream &os, const PDSElement &val)`
  - `std::ostream & operator<< (std::ostream &os, const PDBHeader &d)`
  - `std::ostream & operator<< (std::ostream &os, const PhotometricInterpretation &val)`
  - `std::ostream & operator<< (std::ostream &os, const PixelFormat &pf)`
  - `std::ostream & operator<< (std::ostream &os, const Preamble &val)`
  - `std::ostream & operator<< (std::ostream &os, const PrivateDict &val)`
  - `std::ostream & operator<< (std::ostream &os, const PrivateTag &val)`
  - `std::ostream & operator<< (std::ostream &os, const Region &r)`
  - `std::ostream & operator<< (std::ostream &os, const Scanner &s)`
  - `std::ostream & operator<< (std::ostream &os, const Scanner2 &s)`
  - `std::ostream & operator<< (std::ostream &os, const Sorter &s)`
  - `std::ostream & operator<< (std::ostream &os, const StrictScanner &s)`
  - `std::ostream & operator<< (std::ostream &os, const StrictScanner2 &s)`
  - `std::ostream & operator<< (std::ostream &os, const SwapCode &sc)`
  - `std::ostream & operator<< (std::ostream &os, const Version &v)`
  - `std::ostream & operator<< (std::ostream &os, const VL &val)`
  - `std::ostream & operator<< (std::ostream &os, Event &e)`
- Generic inserter operator for [Event](#) and its subclasses.*
- `bool operator== (const CodeString &ref, const CodeString &cs)`
  - `std::istream & operator>> (std::istream &_is, Tag &_val)`
  - `std::istream & operator>> (std::istream &in, ignore_char const &ic)`
  - `template<char TDelimiter, unsigned int TMaxLength, char TPadChar>  
std::istream & operator>> (std::istream &is, String< TDelimiter, TMaxLength, TPadChar > &ms)`
  - `template<typename T >  
static int Round (T x)`
  - `static int roundat (char *buf, size_t bufLen, unsigned int i, int iexp)`
  - `TYPETOENCODING (SQ, VRBINARY, unsigned char) TYPETOENCODING(UN`
  - `template<typename Float >  
static void x16printf (char *buf, int size, Float f)`

## Variables

- static [Global GlobalInstance](#)
- [VRBINARY](#)

### 9.1.1 Detailed Description

This header defines the classes for the AA Actions, Association Abort Related Actions ([Table 9-9](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the AE Actions, Association Establishment Related Actions ([Table 9-6](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the AR Actions, Association Release Related Actions ([Table 9-8](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

This header defines the classes for the DT Actions, Data Transfer Related Actions ([Table 9-8](#) of ps 3.8-2009).

Since each class is essentially a placeholder for a function pointer, I'm breaking with having each class have its own file for the sake of brevity of the number of files.

### 9.1.2 Typedef Documentation

#### 9.1.2.1 AEComp

```
typedef String<'\\',16> gdcmm::AEComp
```

#### 9.1.2.2 ASComp

```
typedef String<'\\',64> gdcmm::ASComp
```



### 9.1.2.3 BOOL\_FUNCTION\_PFILE\_PFILE\_POINTER

```
typedef bool (* gdcm::BOOL_FUNCTION_PFILE_PFILE_POINTER) (File *, File *)
```

### 9.1.2.4 CSComp

```
typedef String<'\\', 16> gdcm::CSComp
```

### 9.1.2.5 DComp

```
typedef String<'\\', 64> gdcm::DComp
```

### 9.1.2.6 DTComp

```
typedef String<'\\', 64> gdcm::DTComp
```

### 9.1.2.7 FileList

```
typedef std::vector< SmartPointer<FileWithName> > gdcm::FileList
```

### 9.1.2.8 IconImage

```
typedef Bitmap gdcm::IconImage
```

### 9.1.2.9 LOComp

```
typedef String<'\\', 64> gdcm::LOComp
```

#### 9.1.2.10 LTComp

```
typedef String<'\\', 64> gdc::LTComp
```

#### 9.1.2.11 MacroEntry

```
typedef ModuleEntry gdc::MacroEntry
```

#### 9.1.2.12 NestedMacroEntries

```
typedef NestedModuleEntries gdc::NestedMacroEntries
```

#### 9.1.2.13 PNComp

```
typedef String<'\\', 64> gdc::PNComp
```

#### 9.1.2.14 SHComp

```
typedef String<'\\', 64> gdc::SHComp
```

#### 9.1.2.15 STComp

```
typedef String<'\\', 64> gdc::STComp
```

#### 9.1.2.16 TMComp

```
typedef String<'\\', 16> gdc::TMComp
```

### 9.1.2.17 UCComp

```
typedef String<'\\', 4294967294> gdcm::UCComp
```

### 9.1.2.18 UIComp

```
typedef String<'\\', 64, 0> gdcm::UIComp
```

### 9.1.2.19 URComp

```
typedef String<'\\', 4294967294> gdcm::URComp
```

### 9.1.2.20 UTComp

```
typedef String<'\\', 64> gdcm::UTComp
```

## 9.1.3 Enumeration Type Documentation

### 9.1.3.1 CompOperators

```
enum gdcm::CompOperators
```

Enumerator

GDCM_EQUAL	
GDCM_DIFFERENT	
GDCM_GREATER	
GDCM_GREATEROREQUAL	
GDCM_LESS	
GDCM_LESOREQUAL	

### 9.1.3.2 ECharSet

enum `gdcm::ECharSet`

The character sets enumerated in PS 3.3 2009 Annex C, section C.12.1.1.2 The resulting character set is stored in 0008,0005 The conversion to the data element is performed by the [QueryFactory](#) itself

#### Enumerator

eLatin1	
eLatin2	
eLatin3	
eLatin4	
eCyrillic	
eArabic	
eGreek	
eHebrew	
eLatin5	
eJapanese	
eThai	
eJapaneseKanjiMultibyte	
eJapaneseSupplementaryKanjiMultibyte	
eKoreanHangulHanjaMultibyte	
eUTF8	
eGB18030	

### 9.1.3.3 ENQueryType

enum `gdcm::ENQueryType`

#### Enumerator

eCreateMMPS	
eSetMMPS	

### 9.1.3.4 EQueryLevel

enum `gdcm::EQueryLevel`

#### Enumerator

ePatient	
----------	--

## Enumerator

eStudy	
eSeries	
eImage	

**9.1.3.5 EQueryType**

```
enum gdcM::EQueryType
```

## Enumerator

eFind	
eMove	
eWLMFind	

**9.1.3.6 ERootType**

```
enum gdcM::ERootType
```

## Enumerator

ePatientRootType	
eStudyRootType	

**9.1.3.7 LodModeType**

```
enum gdcM::LodModeType
```

## Enumerator

LD_ALL	
LD_NOSEQ	
LD_NOSHADOW	
LD_NOSHADOWSEQ	

## 9.1.4 Function Documentation

### 9.1.4.1 `add1()`

```
static int gdcM::add1 (  
    char * buf,  
    int n ) [static]
```

References [add1\(\)](#).

Referenced by [add1\(\)](#), and [doround\(\)](#).

### 9.1.4.2 `backslash()`

```
ignore_char const gdcM::backslash (  
    '\\ ' )
```

Referenced by [gdcM::EncodingImplementation< VR::VRASCII >::ReadComputeLength\(\)](#).

### 9.1.4.3 `Clamp()`

```
template<typename T >  
static T gdcM::Clamp (  
    int v ) [inline], [static]
```

### 9.1.4.4 `clean()`

```
static void gdcM::clean (  
    char * mant ) [inline], [static]
```

Referenced by [x16printf\(\)](#).

#### 9.1.4.5 doround()

```
static int gdcm::doround (
    char * buf,
    unsigned int n ) [static]
```

References [add1\(\)](#).

Referenced by [roundat\(\)](#).

#### 9.1.4.6 GetVRFromTag()

```
VR::VRType gdcm::GetVRFromTag (
    Tag const & tag )
```

#### 9.1.4.7 operator"!="() [1/2]

```
bool gdcm::operator!= (
    const CodeString & ref,
    const CodeString & cs ) [inline]
```

#### 9.1.4.8 operator"!="() [2/2]

```
bool gdcm::operator!= (
    const DataElement & lhs,
    const DataElement & rhs ) [inline]
```

#### 9.1.4.9 operator<<() [1/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const GroupDict & _val ) [inline]
```

#### 9.1.4.10 operator<<() [2/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const IOD & _val ) [inline]
```

#### 9.1.4.11 operator<<() [3/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const IODEntry & _val ) [inline]
```

#### 9.1.4.12 operator<<() [4/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const IODs & _val ) [inline]
```

#### 9.1.4.13 operator<<() [5/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Macro & _val ) [inline]
```

#### 9.1.4.14 operator<<() [6/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Macros & _val ) [inline]
```

#### 9.1.4.15 operator<<() [7/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const MediaStorage & ms ) [inline]
```



**9.1.4.16 operator<<() [8/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const Module & _val ) [inline]
```

**9.1.4.17 operator<<() [9/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const ModuleEntry & _val ) [inline]
```

**9.1.4.18 operator<<() [10/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const Modules & _val ) [inline]
```

**9.1.4.19 operator<<() [11/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const NestedModuleEntries & _val ) [inline]
```

**9.1.4.20 operator<<() [12/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const Tag & _val ) [inline]
```

**9.1.4.21 operator<<() [13/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const TransferSyntax & ts ) [inline]
```

#### 9.1.4.22 `operator<<()` [14/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Type & val ) [inline]
```

#### 9.1.4.23 `operator<<()` [15/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const UI & _val ) [inline]
```

#### 9.1.4.24 `operator<<()` [16/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const UIDs & uid ) [inline]
```

References [gdcmm::UIDs::GetName\(\)](#), and [gdcmm::UIDs::GetString\(\)](#).

#### 9.1.4.25 `operator<<()` [17/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const Usage & val ) [inline]
```

#### 9.1.4.26 `operator<<()` [18/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & _os,
    const VM & _val ) [inline]
```

**9.1.4.27 operator<<() [19/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & _os,
    const VR & val ) [inline]
```

**9.1.4.28 operator<<() [20/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const BasicOffsetTable & val ) [inline]
```

**9.1.4.29 operator<<() [21/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CodeString & str ) [inline]
```

**9.1.4.30 operator<<() [22/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CommandDataSet & val ) [inline]
```

**9.1.4.31 operator<<() [23/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CSAElement & val ) [inline]
```

**9.1.4.32 operator<<() [24/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const CSAHeader & d ) [inline]
```

**9.1.4.33 operator<<() [25/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const CSAHeaderDict & val ) [inline]
```

**9.1.4.34 operator<<() [26/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const CSAHeaderDictEntry & val ) [inline]
```

**9.1.4.35 operator<<() [27/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const DataElement & val ) [inline]
```

**9.1.4.36 operator<<() [28/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const DataSet & val ) [inline]
```

**9.1.4.37 operator<<() [29/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Dict & val ) [inline]
```

**9.1.4.38 operator<<() [30/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const DictEntry & val ) [inline]
```

**9.1.4.39 operator<<() [31/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Dicts & d ) [inline]
```

**9.1.4.40 operator<<() [32/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Directory & d ) [inline]
```

**9.1.4.41 operator<<() [33/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const DPath & val ) [inline]
```

**9.1.4.42 operator<<() [34/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const File & val ) [inline]
```

**9.1.4.43 operator<<() [35/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const FileMetaInformation & val ) [inline]
```

**9.1.4.44 operator<<() [36/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const FileSet & f ) [inline]
```

**9.1.4.45 operator<<() [37/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Fragment & val ) [inline]
```

**9.1.4.46 operator<<() [38/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Global & g ) [inline]
```

**9.1.4.47 operator<<() [39/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Item & val ) [inline]
```

**9.1.4.48 operator<<() [40/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const MrProtocol & d ) [inline]
```

**9.1.4.49 operator<<() [41/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Object & obj ) [inline]
```

**9.1.4.50 operator<<() [42/59]**

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Orientation & o ) [inline]
```

**9.1.4.51 operator<<() [43/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const PDBElement & val ) [inline]
```

**9.1.4.52 operator<<() [44/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const PDBHeader & d ) [inline]
```

**9.1.4.53 operator<<() [45/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const PhotometricInterpretation & val ) [inline]
```

**9.1.4.54 operator<<() [46/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const PixelFormat & pf ) [inline]
```

**9.1.4.55 operator<<() [47/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Preamble & val ) [inline]
```

**9.1.4.56 operator<<() [48/59]**

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const PrivateDict & val ) [inline]
```

#### 9.1.4.57 operator<<() [49/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const PrivateTag & val ) [inline]
```

#### 9.1.4.58 operator<<() [50/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Region & r ) [inline]
```

References [gdcmm::Region::Print\(\)](#).

#### 9.1.4.59 operator<<() [51/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Scanner & s ) [inline]
```

#### 9.1.4.60 operator<<() [52/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Scanner2 & s ) [inline]
```

#### 9.1.4.61 operator<<() [53/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    const Sorter & s ) [inline]
```



**9.1.4.62 operator<<()** [54/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const StrictScanner & s ) [inline]
```

**9.1.4.63 operator<<()** [55/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const StrictScanner2 & s ) [inline]
```

**9.1.4.64 operator<<()** [56/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const SwapCode & sc ) [inline]
```

**9.1.4.65 operator<<()** [57/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const Version & v ) [inline]
```

**9.1.4.66 operator<<()** [58/59]

```
std::ostream & gdcm::operator<< (
    std::ostream & os,
    const VL & val ) [inline]
```

**9.1.4.67 operator<<()** [59/59]

```
std::ostream & gdcmm::operator<< (
    std::ostream & os,
    Event & e ) [inline]
```

Generic inserter operator for [Event](#) and its subclasses.

References [gdcmm::Event::Print\(\)](#).

**9.1.4.68 operator==( )**

```
bool gdcmm::operator==(
    const CodeString & ref,
    const CodeString & cs ) [inline]
```

**Examples**

[DumpPhilipsECHO.cxx](#).

**9.1.4.69 operator>>()** [1/3]

```
std::istream & gdcmm::operator>> (
    std::istream & _is,
    Tag & _val ) [inline]
```

**9.1.4.70 operator>>()** [2/3]

```
std::istream & gdcmm::operator>> (
    std::istream & in,
    ignore_char const & ic ) [inline]
```

References [gdcmm::ignore\\_char::m\\_char](#).

**9.1.4.71 operator>>()** [3/3]

```
template<char TDelimiter, unsigned int TMaxLength, char TPadChar>
std::istream & gdcmm::operator>> (
    std::istream & is,
    String< TDelimiter, TMaxLength, TPadChar > & ms ) [inline]
```

#### 9.1.4.72 Round()

```
template<typename T >
static int gdcm::Round (
    T x ) [inline], [static]
```

Referenced by [gdcm::ImageChangePhotometricInterpretation::RGB2YBR\(\)](#), and [gdcm::ImageChangePhotometricInterpretation::YBR2RGB\(\)](#).

#### 9.1.4.73 roundat()

```
static int gdcm::roundat (
    char * buf,
    size_t bufLen,
    unsigned int i,
    int iexp ) [static]
```

References [doround\(\)](#).

Referenced by [x16printf\(\)](#).

#### 9.1.4.74 TYPETOENCODING()

```
gdcm::TYPETOENCODING (
    SQ ,
    VRBINARY ,
    unsigned char )
```

#### 9.1.4.75 x16printf()

```
template<typename Float >
static void gdcm::x16printf (
    char * buf,
    int size,
    Float f ) [static]
```

References [clean\(\)](#), and [roundat\(\)](#).

Referenced by [gdcm::EncodingImplementation< VR::VRASCII >::Write\(\)](#).

### 9.1.5 Variable Documentation

### 9.1.5.1 GlobalInstance

`Global` `gdcmm::GlobalInstance` `[static]`

### 9.1.5.2 VRBINARY

`gdcmm::VRBINARY`

Referenced by `gdcmm::Element< TVR, VM::VM1_n >::Set()`, and `gdcmm::Element< TVR, VM::VM1_n >::SetNoSwap()`.

## 9.2 gdcmm::network Namespace Reference

### Classes

- class `AAbortPDU`  
*AAbortPDU.*
- class `AAssociateACPDU`  
*AAssociateACPDU.*
- class `AAssociateRJPDU`  
*AAssociateRJPDU.*
- class `AAssociateRQPDU`  
*AAssociateRQPDU.*
- class `AbstractSyntax`  
*AbstractSyntax.*
- class `ApplicationContext`  
*ApplicationContext.*
- class `AReleaseRPPDU`  
*AReleaseRPPDU.*
- class `AReleaseRQPDU`  
*AReleaseRQPDU.*
- class `ARTIMTimer`  
*ARTIMTimer.*
- class `AsynchronousOperationsWindowSub`  
*AsynchronousOperationsWindowSub.*
- class `BaseCompositeMessage`  
*BaseCompositeMessage.*
- class `BaseNormalizedMessage`  
*BaseNormalizedMessage.*
- class `BasePDU`  
*BasePDU.*
- class `CEchoRQ`  
*CEchoRQ.*
- class `CEchoRSP`

- CEchoRSP* this file defines the messages for the cecho action.
- class [CFind](#)
- class [CFindCancelRQ](#)
  - CFindCancelRQ* this file defines the messages for the cfind action.
- class [CFindRQ](#)
  - CFindRQ*.
- class [CFindRSP](#)
  - CFindRSP* this file defines the messages for the cfind action.
- class [CMoveCancelRq](#)
- class [CMoveRQ](#)
  - CMoveRQ*.
- class [CMoveRSP](#)
  - CMoveRSP* this file defines the messages for the cmove action.
- class [CompositeMessageFactory](#)
  - CompositeMessageFactory*.
- class [CStoreRQ](#)
  - CStoreRQ*.
- class [CStoreRSP](#)
  - CStoreRSP* this file defines the messages for the cecho action.
- class [DIMSE](#)
  - DIMSE*.
- class [ImplementationClassUIDSub](#)
  - ImplementationClassUIDSub*.
- class [ImplementationUIDSub](#)
  - ImplementationUIDSub*.
- class [ImplementationVersionNameSub](#)
  - ImplementationVersionNameSub*.
- class [MaximumLengthSub](#)
  - MaximumLengthSub*.
- class [NActionRQ](#)
  - NActionRQ*.
- class [NActionRSP](#)
  - NActionRSP* this file defines the messages for the NAction action.
- class [NCreateRQ](#)
  - NCreateRQ*.
- class [NCreateRSP](#)
  - NCreateRSP* this file defines the messages for the ncreate action.
- class [NDeleteRQ](#)
  - NDeleteRQ*.
- class [NDeleteRSP](#)
  - NDeleteRSP* this file defines the messages for the ndelete action.
- class [NEventReportRQ](#)
  - NEventReportRQ*.
- class [NEventReportRSP](#)
  - NEventReportRSP* this file defines the messages for the neventreport action.
- class [NGetRQ](#)
  - NGetRQ*.

- class [NGetRSP](#)  
*NGetRSP* this file defines the messages for the nget action.
- class [NormalizedMessageFactory](#)
- class [NSetRQ](#)  
*NSetRQ*.
- class [NSetRSP](#)  
*NSetRSP* this file defines the messages for the nset action.
- class [PDataTFPDU](#)  
*PDataTFPDU*.
- class [PDUFactory](#)  
*PDUFactory* basically, given an initial byte, construct the.
- class [PresentationContextAC](#)  
*PresentationContextAC*.
- class [PresentationContextRQ](#)  
*PresentationContextRQ*.
- class [PresentationDataValue](#)  
*PresentationDataValue*.
- class [RoleSelectionSub](#)  
*RoleSelectionSub*.
- class [ServiceClassApplicationInformation](#)
- class [SOPClassExtendedNegociationSub](#)  
*SOPClassExtendedNegociationSub*.
- class [TableRow](#)
- class [TransferSyntaxSub](#)  
*TransferSyntaxSub*.
- struct [Transition](#)
- class [ULAction](#)  
*ULAction*.
- class [ULActionAA1](#)
- class [ULActionAA2](#)
- class [ULActionAA3](#)
- class [ULActionAA4](#)
- class [ULActionAA5](#)
- class [ULActionAA6](#)
- class [ULActionAA7](#)
- class [ULActionAA8](#)
- class [ULActionAE1](#)
- class [ULActionAE2](#)
- class [ULActionAE3](#)
- class [ULActionAE4](#)
- class [ULActionAE5](#)
- class [ULActionAE6](#)
- class [ULActionAE7](#)
- class [ULActionAE8](#)
- class [ULActionAR1](#)
- class [ULActionAR10](#)
- class [ULActionAR2](#)
- class [ULActionAR3](#)
- class [ULActionAR4](#)

- class [ULActionAR5](#)
- class [ULActionAR6](#)
- class [ULActionAR7](#)
- class [ULActionAR8](#)
- class [ULActionAR9](#)
- class [ULActionDT1](#)
- class [ULActionDT2](#)
- class [ULBasicCallback](#)  
*ULBasicCallback.*
- class [ULConnection](#)  
*ULConnection.*
- class [ULConnectionCallback](#)
- class [ULConnectionInfo](#)  
*ULConnectionInfo.*
- class [ULConnectionManager](#)  
*ULConnectionManager.*
- class [ULEvent](#)  
*ULEvent.*
- class [ULTransitionTable](#)  
*ULTransitionTable* The transition table of all the *ULEvents*, new *ULActions*, and *ULStates*.
- class [ULWritingCallback](#)
- class [UserInformation](#)  
*UserInformation.*

## Enumerations

- enum [EEventID](#) {  
[eAASSOCIATERequestLocalUser](#) = 0 ,  
[eTransportConnConfirmLocal](#) ,  
[eASSOCIATE\\_ACPDURECEIVED](#) ,  
[eASSOCIATE\\_RJPDURECEIVED](#) ,  
[eTransportConnIndicLocal](#) ,  
[eAASSOCIATE\\_RQPDURECEIVED](#) ,  
[eAASSOCIATEresponseAccept](#) ,  
[eAASSOCIATEresponseReject](#) ,  
[ePDATArequest](#) ,  
[ePDATATFPDU](#) ,  
[eARELEASERequest](#) ,  
[eARELEASE\\_RQPDURECEIVEDOPEN](#) ,  
[eARELEASE\\_RPPDURECEIVED](#) ,  
[eARELEASEResponse](#) ,  
[eAABORTRequest](#) ,  
[eAABORTPDURECEIVEDOPEN](#) ,  
[eTransportConnectionClosed](#) ,  
[eARTIMTimerExpired](#) ,  
[eUnrecognizedPDURECEIVED](#) ,  
[eEventDoesNotExist](#) }

- enum [EStateID](#) {  
[eStaDoesNotExist](#) = 0 ,  
[eSta1Idle](#) = 1 ,  
[eSta2Open](#) = 2 ,  
[eSta3WaitLocalAssoc](#) = 4 ,  
[eSta4LocalAssocDone](#) = 8 ,  
[eSta5WaitRemoteAssoc](#) = 16 ,  
[eSta6TransferReady](#) = 32 ,  
[eSta7WaitRelease](#) = 64 ,  
[eSta8WaitLocalRelease](#) = 128 ,  
[eSta9ReleaseCollisionRqLocal](#) = 256 ,  
[eSta10ReleaseCollisionAc](#) = 512 ,  
[eSta11ReleaseCollisionRq](#) = 1024 ,  
[eSta12ReleaseCollisionAcLocal](#) = 2048 ,  
[eSta13AwaitingClose](#) = 4096 }

## Functions

- int [GetStateIndex](#) ([EStateID](#) inState)

## Variables

- const int [cMaxEventID](#) = [eEventDoesNotExist](#)
- const int [cMaxStateID](#) = 13

## 9.2.1 Enumeration Type Documentation

### 9.2.1.1 EEventID

enum [gdcn::network::EEventID](#)

#### Enumerator

<a href="#">eAASSOCIATERequestLocalUser</a>	
<a href="#">eTransportConnConfirmLocal</a>	
<a href="#">eASSOCIATE_ACPDUreceived</a>	
<a href="#">eASSOCIATE_RJPDUreceived</a>	
<a href="#">eTransportConnIndicLocal</a>	
<a href="#">eAASSOCIATE_RQPDUreceived</a>	
<a href="#">eAASSOCIATEResponseAccept</a>	
<a href="#">eAASSOCIATEResponseReject</a>	
<a href="#">ePDATArequest</a>	
<a href="#">ePDATATFPDU</a>	
<a href="#">eARELEASERequest</a>	



## Enumerator

eARELEASE_RQPDURceivedOpen	
eARELEASE_RPPDURceived	
eARELEASEResponse	
eAABORTRequest	
eAABORTPDURceivedOpen	
eTransportConnectionClosed	
eARTIMTimerExpired	
eUnrecognizedPDURceived	
eEventDoesNotExist	

## 9.2.1.2 EStateID

```
enum gdcmm::network::EStateID
```

Each network connection will be in a particular state at any given time. Those states have IDs as described in the standard ps3.8-2009, roughly 1-13. This enumeration lists those states. The actual ULState class will contain more information about transitions to other states.

name and date: 16 sept 2010 mmr

## Enumerator

eStaDoesNotExist	
eSta1Idle	
eSta2Open	
eSta3WaitLocalAssoc	
eSta4LocalAssocDone	
eSta5WaitRemoteAssoc	
eSta6TransferReady	
eSta7WaitRelease	
eSta8WaitLocalRelease	
eSta9ReleaseCollisionRqLocal	
eSta10ReleaseCollisionAc	
eSta11ReleaseCollisionRq	
eSta12ReleaseCollisionAcLocal	
eSta13AwaitingClose	

## 9.2.2 Function Documentation

### 9.2.2.1 GetStateIndex()

```
int gdcn::network::GetStateIndex (
    EStateID inState ) [inline]
```

References [eSta10ReleaseCollisionAc](#), [eSta11ReleaseCollisionRq](#), [eSta12ReleaseCollisionAcLocal](#), [eSta13AwaitingClose](#), [eSta1Idle](#), [eSta2Open](#), [eSta3WaitLocalAssoc](#), [eSta4LocalAssocDone](#), [eSta5WaitRemoteAssoc](#), [eSta6TransferReady](#), [eSta7WaitRelease](#), [eSta8WaitLocalRelease](#), [eSta9ReleaseCollisionRqLocal](#), and [eStaDoesNotExist](#).

## 9.2.3 Variable Documentation

### 9.2.3.1 cMaxEventID

```
const int gdcn::network::cMaxEventID = eEventDoesNotExist
```

### 9.2.3.2 cMaxStateID

```
const int gdcn::network::cMaxStateID = 13
```

Referenced by [gdcn::network::TableRow::TableRow\(\)](#), and [gdcn::network::TableRow::~~TableRow\(\)](#).

## 9.3 gdcn::SegmentHelper Namespace Reference

### Classes

- struct [BasicCodedEntry](#)

*This structure defines a basic coded entry with all of its attributes.*

## 9.4 gdcn::terminal Namespace Reference

Class for Terminal.

## Enumerations

- enum `Attribute` {  
    `reset` = 0 ,  
    `bright` = 1 ,  
    `dim` = 2 ,  
    `underline` = 3 ,  
    `blink` = 5 ,  
    `reverse` = 7 ,  
    `hidden` = 8 }
- enum `Color` {  
    `black` = 0 ,  
    `red` ,  
    `green` ,  
    `yellow` ,  
    `blue` ,  
    `magenta` ,  
    `cyan` ,  
    `white` }
- enum `Mode` {  
    `CONSOLE` = 0 ,  
    `VT100` }

## Functions

- `GDCM_EXPORT` std::string `setattribute` (`Attribute` att)
- `GDCM_EXPORT` std::string `setbgcolor` (`Color` c)
- `GDCM_EXPORT` std::string `setfgcolor` (`Color` c)
- `GDCM_EXPORT` void `setmode` (`Mode` m)

### 9.4.1 Detailed Description

Class for Terminal.

Allow one to print in color in a shell

- support VT100 compatible shell
- win32 console

### 9.4.2 Enumeration Type Documentation

#### 9.4.2.1 Attribute

```
enum gdcm::terminal::Attribute
```

**Enumerator**

reset	
bright	
dim	
underline	
blink	
reverse	
hidden	

**9.4.2.2 Color**

```
enum gdcmm::terminal::Color
```

**Enumerator**

black	
red	
green	
yellow	
blue	
magenta	
cyan	
white	

**9.4.2.3 Mode**

```
enum gdcmm::terminal::Mode
```

**Enumerator**

CONSOLE	
VT100	

**9.4.3 Function Documentation**

#### 9.4.3.1 setattribute()

```
GDCM_EXPORT std::string gdcm::terminal::setattribute (
    Attribute att )
```

#### 9.4.3.2 setbgcolor()

```
GDCM_EXPORT std::string gdcm::terminal::setbgcolor (
    Color c )
```

#### 9.4.3.3 setfgcolor()

```
GDCM_EXPORT std::string gdcm::terminal::setfgcolor (
    Color c )
```

#### 9.4.3.4 setmode()

```
GDCM_EXPORT void gdcm::terminal::setmode (
    Mode m )
```



## Chapter 10

# Class Documentation

### 10.1 gdcm::network::AAabortPDU Class Reference

[AAabortPDU](#).

```
#include <gdcmAAabortPDU.h>
```

Inheritance diagram for `gdcm::network::AAabortPDU`:

Collaboration diagram for `gdcm::network::AAabortPDU`:

#### Public Member Functions

- [AAabortPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- void [SetReason](#) (const uint8\_t r)
- void [SetSource](#) (const uint8\_t s)
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

#### 10.1.1 Detailed Description

[AAabortPDU](#).

[Table 9-26 A-ABORT PDU FIELDS](#)

#### 10.1.2 Constructor & Destructor Documentation

### 10.1.2.1 AAbortPDU()

```
gdcmm::network::AAabortPDU::AAabortPDU ( )
```

## 10.1.3 Member Function Documentation

### 10.1.3.1 IsLastFragment()

```
bool gdcmm::network::AAabortPDU::IsLastFragment ( ) const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.1.3.2 Print()

```
void gdcmm::network::AAabortPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.1.3.3 Read()

```
std::istream & gdcmm::network::AAabortPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.1.3.4 SetReason()

```
void gdcmm::network::AAabortPDU::SetReason (
    const uint8_t r )
```



### 10.1.3.5 SetSource()

```
void gdcm::network::AAabortPDU::SetSource (
    const uint8_t s )
```

### 10.1.3.6 Size()

```
size_t gdcm::network::AAabortPDU::Size ( ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

### 10.1.3.7 Write()

```
const std::ostream & gdcm::network::AAabortPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

The documentation for this class was generated from the following file:

- [gdcmAAabortPDU.h](#)

## 10.2 gdcm::network::AAssociateACPDU Class Reference

[AAssociateACPDU](#).

```
#include <gdcmAAssociateACPDU.h>
```

Inheritance diagram for `gdcm::network::AAssociateACPDU`:

Collaboration diagram for `gdcm::network::AAssociateACPDU`:

### Public Types

- typedef std::vector< [PresentationContextAC](#) >::size\_type [SizeType](#)

## Public Member Functions

- [AAssociateACPDU](#) ()
- void [AddPresentationContextAC](#) ([PresentationContextAC](#) const &pcac)
- [SizeType](#) [GetNumberOfPresentationContextAC](#) () const
- const [PresentationContextAC](#) & [GetPresentationContextAC](#) ([SizeType](#) i)
- const [UserInfo](#) & [GetUserInfo](#) () const
- void [InitFromRQ](#) ([AAssociateRQPDU](#) const &rqpdu)
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- [SizeType](#) [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

## Protected Member Functions

- void [SetCalledAETitle](#) (const char calledaetitle[16])
- void [SetCallingAETitle](#) (const char callingaetitle[16])

## Friends

- class [AAssociateRQPDU](#)

### 10.2.1 Detailed Description

[AAssociateACPDU](#).

[Table](#) 9-17 ASSOCIATE-AC PDU fields

### 10.2.2 Member Typedef Documentation

#### 10.2.2.1 SizeType

```
typedef std::vector<PresentationContextAC>::size_type gdcm::network::AAssociateACPDU::SizeType
```

### 10.2.3 Constructor & Destructor Documentation

### 10.2.3.1 AAssociateACPDU()

```
gdcm::network::AAssociateACPDU::AAssociateACPDU ( )
```

## 10.2.4 Member Function Documentation

### 10.2.4.1 AddPresentationContextAC()

```
void gdcm::network::AAssociateACPDU::AddPresentationContextAC (
    PresentationContextAC const & pcac )
```

### 10.2.4.2 GetNumberOfPresentationContextAC()

```
SizeType gdcm::network::AAssociateACPDU::GetNumberOfPresentationContextAC ( ) const [inline]
```

### 10.2.4.3 GetPresentationContextAC()

```
const PresentationContextAC & gdcm::network::AAssociateACPDU::GetPresentationContextAC (
    SizeType i ) [inline]
```

### 10.2.4.4 GetUserInfoInformation()

```
const UserInformation & gdcm::network::AAssociateACPDU::GetUserInfoInformation ( ) const [inline]
```

### 10.2.4.5 InitFromRQ()

```
void gdcm::network::AAssociateACPDU::InitFromRQ (
    AAssociateRQPDU const & rqpdu )
```

#### 10.2.4.6 IsLastFragment()

```
bool gdcn::network::AAssociateACPDU::IsLastFragment ( ) const [inline], [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.2.4.7 Print()

```
void gdcn::network::AAssociateACPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.2.4.8 Read()

```
std::istream & gdcn::network::AAssociateACPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.2.4.9 SetCalledAETitle()

```
void gdcn::network::AAssociateACPDU::SetCalledAETitle (
    const char calledaetitle[16] ) [protected]
```

#### 10.2.4.10 SetCallingAETitle()

```
void gdcn::network::AAssociateACPDU::SetCallingAETitle (
    const char callingaetitle[16] ) [protected]
```

#### 10.2.4.11 Size()

```
SizeType gdcn::network::AAssociateACPDU::Size ( ) const [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.2.4.12 Write()

```
const std::ostream & gdcm::network::AAssociateACPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

### 10.2.5 Friends And Related Function Documentation

#### 10.2.5.1 AAssociateRQPDU

```
friend class AAssociateRQPDU [friend]
```

The documentation for this class was generated from the following file:

- [gdcmAAssociateACPDU.h](#)

## 10.3 gdcm::network::AAssociateRJPDU Class Reference

[AAssociateRJPDU](#).

```
#include <gdcmAAssociateRJPDU.h>
```

Inheritance diagram for gdcm::network::AAssociateRJPDU:

Collaboration diagram for gdcm::network::AAssociateRJPDU:

### Public Member Functions

- [AAssociateRJPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

#### 10.3.1 Detailed Description

[AAssociateRJPDU](#).

[Table 9-21 ASSOCIATE-RJ PDU FIELDS](#)

## 10.3.2 Constructor & Destructor Documentation

### 10.3.2.1 AAssociateRJPDU()

```
gdcmm::network::AAssociateRJPDU::AAssociateRJPDU ( )
```

## 10.3.3 Member Function Documentation

### 10.3.3.1 IsLastFragment()

```
bool gdcmm::network::AAssociateRJPDU::IsLastFragment ( ) const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.3.3.2 Print()

```
void gdcmm::network::AAssociateRJPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.3.3.3 Read()

```
std::istream & gdcmm::network::AAssociateRJPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.3.3.4 Size()

```
size_t gdcmm::network::AAssociateRJPDU::Size ( ) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.3.3.5 Write()

```
const std::ostream & gdcm::network::AAssociateRJPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

The documentation for this class was generated from the following file:

- [gdcmAAssociateRJPDU.h](#)

## 10.4 gdcm::network::AAssociateRQPDU Class Reference

[AAssociateRQPDU](#).

```
#include <gdcmAAssociateRQPDU.h>
```

Inheritance diagram for `gdcm::network::AAssociateRQPDU`:

Collaboration diagram for `gdcm::network::AAssociateRQPDU`:

### Public Types

- typedef std::vector< [PresentationContextRQ](#) > [PresentationContextArrayType](#)
- typedef std::vector< [PresentationContextRQ](#) >::size\_type [SizeType](#)

### Public Member Functions

- [AAssociateRQPDU](#) ()
- [AAssociateRQPDU](#) (const [AAssociateRQPDU](#) &pdu)
- void [AddPresentationContext](#) ([PresentationContextRQ](#) const &pc)
- std::string [GetCalledAETitle](#) () const
- std::string [GetCallingAETitle](#) () const
- [SizeType](#) [GetNumberOfPresentationContext](#) () const
- [PresentationContextRQ](#) const & [GetPresentationContext](#) ([SizeType](#) i) const
- const [PresentationContextRQ](#) \* [GetPresentationContextByAbstractSyntax](#) ([AbstractSyntax](#) const &absyn) const
- const [PresentationContextRQ](#) \* [GetPresentationContextByID](#) (uint8\_t i) const
- [PresentationContextArrayType](#) const & [GetPresentationContexts](#) ()
- const [UserInformation](#) & [GetUserInformation](#) () const
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- void [SetCalledAETitle](#) (const char calledaetitle[16])  
*Set the Called AE Title.*
- void [SetCallingAETitle](#) (const char callingaetitle[16])  
*Set the Calling AE Title.*
- void [SetUserInformation](#) ([UserInformation](#) const &ui)
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

## Static Public Member Functions

- static bool [IsAETitleValid](#) (const char title[16])  
*Check whether or not the.*

## Protected Member Functions

- std::string [GetReserved43\\_74](#) () const

## Friends

- class [AAssociateACPDU](#)

### 10.4.1 Detailed Description

[AAssociateRQPDU](#).

[Table](#) 9-11 ASSOCIATE-RQ PDU fields

### 10.4.2 Member Typedef Documentation

#### 10.4.2.1 PresentationContextArrayType

```
typedef std::vector<PresentationContextRQ> gdcn::network::AAssociateRQPDU::PresentationContextArrayType
```

#### 10.4.2.2 SizeType

```
typedef std::vector<PresentationContextRQ>::size_type gdcn::network::AAssociateRQPDU::SizeType
```

### 10.4.3 Constructor & Destructor Documentation

#### 10.4.3.1 AAssociateRQPDU() [1/2]

```
gdcn::network::AAssociateRQPDU::AAssociateRQPDU ( )
```



### 10.4.3.2 AAssociateRQPDU() [2/2]

```
gdcm::network::AAssociateRQPDU::AAssociateRQPDU (  
    const AAssociateRQPDU & pdu ) [inline]
```

## 10.4.4 Member Function Documentation

### 10.4.4.1 AddPresentationContext()

```
void gdcm::network::AAssociateRQPDU::AddPresentationContext (  
    PresentationContextRQ const & pc )
```

### 10.4.4.2 GetCalledAETitle()

```
std::string gdcm::network::AAssociateRQPDU::GetCalledAETitle ( ) const [inline]
```

### 10.4.4.3 GetCallingAETitle()

```
std::string gdcm::network::AAssociateRQPDU::GetCallingAETitle ( ) const [inline]
```

### 10.4.4.4 GetNumberOfPresentationContext()

```
SizeType gdcm::network::AAssociateRQPDU::GetNumberOfPresentationContext ( ) const [inline]
```

### 10.4.4.5 GetPresentationContext()

```
PresentationContextRQ const & gdcm::network::AAssociateRQPDU::GetPresentationContext (  
    SizeType i ) const [inline]
```

#### 10.4.4.6 GetPresentationContextByAbstractSyntax()

```
const PresentationContextRQ * gdcmm::network::AAssociateRQPDU::GetPresentationContextByAbstractSyntax (
    AbstractSyntax const & absyn ) const
```

#### 10.4.4.7 GetPresentationContextByID()

```
const PresentationContextRQ * gdcmm::network::AAssociateRQPDU::GetPresentationContextByID (
    uint8_t i ) const
```

#### 10.4.4.8 GetPresentationContexts()

```
PresentationContextArrayType const & gdcmm::network::AAssociateRQPDU::GetPresentationContexts ( )
[inline]
```

#### 10.4.4.9 GetReserved43\_74()

```
std::string gdcmm::network::AAssociateRQPDU::GetReserved43_74 ( ) const [protected]
```

#### 10.4.4.10 GetUserInfoInformation()

```
const UserInformation & gdcmm::network::AAssociateRQPDU::GetUserInfoInformation ( ) const [inline]
```

#### 10.4.4.11 IsAETitleValid()

```
static bool gdcmm::network::AAssociateRQPDU::IsAETitleValid (
    const char title[16] ) [static]
```

Check whether or not the.

##### Parameters

<i>title</i>	is a valid AE title
--------------	---------------------

#### 10.4.4.12 IsLastFragment()

```
bool gdcmm::network::AAAssociateRQPDU::IsLastFragment ( ) const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 10.4.4.13 Print()

```
void gdcmm::network::AAAssociateRQPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

This function will initialize an [AAAssociateACPDU](#) from the fields in the [AAAssociateRQPDU](#) structure

Implements [gdcmm::network::BasePDU](#).

#### 10.4.4.14 Read()

```
std::istream & gdcmm::network::AAAssociateRQPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

#### 10.4.4.15 SetCalledAETitle()

```
void gdcmm::network::AAAssociateRQPDU::SetCalledAETitle (
    const char calledaetitle[16] )
```

Set the Called AE Title.

#### 10.4.4.16 SetCallingAETitle()

```
void gdcmm::network::AAAssociateRQPDU::SetCallingAETitle (
    const char callingaetitle[16] )
```

Set the Calling AE Title.

#### 10.4.4.17 SetUserInfo()

```
void gdcM::network::AAssociateRQPDU::SetUserInfo (
    UserInfo const & ui )
```

#### 10.4.4.18 Size()

```
size_t gdcM::network::AAssociateRQPDU::Size ( ) const [override], [virtual]
```

Implements [gdcM::network::BasePDU](#).

#### 10.4.4.19 Write()

```
const std::ostream & gdcM::network::AAssociateRQPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcM::network::BasePDU](#).

### 10.4.5 Friends And Related Function Documentation

#### 10.4.5.1 AAssociateACPDU

```
friend class AAssociateACPDU [friend]
```

The documentation for this class was generated from the following file:

- [gdcMAAssociateRQPDU.h](#)

## 10.5 gdcM::AbortEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::AbortEvent:

## 10.6 gdcm::network::AbstractSyntax Class Reference

[AbstractSyntax.](#)

```
#include <gdcmAbstractSyntax.h>
```

### Public Member Functions

- [AbstractSyntax](#) ()
- [DataElement GetAsDataElement](#) () const
- const char \* [GetName](#) () const
- bool [operator==](#) (const [AbstractSyntax](#) &as) const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetName](#) (const char \*name)
- void [SetNameFromUID](#) (UIDs::TSName tsname)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.6.1 Detailed Description

[AbstractSyntax.](#)

[Table](#) 9-14 ABSTRACT SYNTAX SUB-ITEM FIELDS

### 10.6.2 Constructor & Destructor Documentation

#### 10.6.2.1 AbstractSyntax()

```
gdcm::network::AbstractSyntax::AbstractSyntax ( )
```

### 10.6.3 Member Function Documentation

#### 10.6.3.1 GetAsDataElement()

```
DataElement gdcm::network::AbstractSyntax::GetAsDataElement ( ) const
```

### 10.6.3.2 GetName()

```
const char * gdcm::network::AbstractSyntax::GetName ( ) const [inline]
```

### 10.6.3.3 operator==()

```
bool gdcm::network::AbstractSyntax::operator== (
    const AbstractSyntax & as ) const [inline]
```

### 10.6.3.4 Print()

```
void gdcm::network::AbstractSyntax::Print (
    std::ostream & os ) const
```

### 10.6.3.5 Read()

```
std::istream & gdcm::network::AbstractSyntax::Read (
    std::istream & is )
```

### 10.6.3.6 SetName()

```
void gdcm::network::AbstractSyntax::SetName (
    const char * name ) [inline]
```

### 10.6.3.7 SetNameFromUID()

```
void gdcm::network::AbstractSyntax::SetNameFromUID (
    UIDs::TSName tname )
```

### 10.6.3.8 Size()

```
size_t gdcm::network::AbstractSyntax::Size ( ) const
```

### 10.6.3.9 Write()

```
const std::ostream & gdcm::network::AbstractSyntax::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmAbstractSyntax.h](#)

## 10.7 gdcm::AnonymizeEvent Class Reference

[AnonymizeEvent](#).

```
#include <gdcmAnonymizeEvent.h>
```

Inheritance diagram for gdcm::AnonymizeEvent:

Collaboration diagram for gdcm::AnonymizeEvent:

### Public Types

- typedef [AnonymizeEvent](#) Self
- typedef [AnyEvent](#) Superclass

### Public Member Functions

- [AnonymizeEvent](#) (const Self &s)
- [AnonymizeEvent](#) (Tag const &tag=0)
- [~AnonymizeEvent](#) () override=default
- bool [CheckEvent](#) (const ::gdcm::Event \*e) const override
- const char \* [GetEventName](#) () const override
- Tag const & [GetTag](#) () const
- ::gdcm::Event \* [MakeObject](#) () const override
- void [operator=](#) (const Self &)=delete
- void [SetTag](#) (const Tag &t)

### 10.7.1 Detailed Description

[AnonymizeEvent](#).

Special type of event triggered during the Anonymization process

See also

[Anonymizer](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.7.2 Member Typedef Documentation

#### 10.7.2.1 Self

```
typedef AnonymizeEvent gdcm::AnonymizeEvent::Self
```

#### 10.7.2.2 Superclass

```
typedef AnyEvent gdcm::AnonymizeEvent::Superclass
```

### 10.7.3 Constructor & Destructor Documentation

#### 10.7.3.1 AnonymizeEvent() [1/2]

```
gdcm::AnonymizeEvent::AnonymizeEvent (
    Tag const & tag = 0 ) [inline]
```

#### 10.7.3.2 ~AnonymizeEvent()

```
gdcm::AnonymizeEvent::~~AnonymizeEvent ( ) [override], [default]
```



### 10.7.3.3 AnonymizeEvent() [2/2]

```
gdcm::AnonymizeEvent::AnonymizeEvent (
    const Self & s ) [inline]
```

## 10.7.4 Member Function Documentation

### 10.7.4.1 CheckEvent()

```
bool gdcm::AnonymizeEvent::CheckEvent (
    const ::gdcm::Event * e ) const [inline], [override]
```

### 10.7.4.2 GetEventName()

```
const char * gdcm::AnonymizeEvent::GetEventName ( ) const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

### 10.7.4.3 GetTag()

```
Tag const & gdcm::AnonymizeEvent::GetTag ( ) const [inline]
```

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.7.4.4 MakeObject()

```
::gdcm::Event * gdcm::AnonymizeEvent::MakeObject ( ) const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

#### 10.7.4.5 operator=()

```
void gdcm::AnonymizeEvent::operator= (
    const Self & ) [delete]
```

#### 10.7.4.6 SetTag()

```
void gdcm::AnonymizeEvent::SetTag (
    const Tag & t ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmAnonymizeEvent.h](#)

## 10.8 gdcm::Anonymizer Class Reference

[Anonymizer.](#)

```
#include <gdcmAnonymizer.h>
```

Inheritance diagram for gdcm::Anonymizer:

Collaboration diagram for gdcm::Anonymizer:

### Public Member Functions

- [Anonymizer](#) ()
- [~Anonymizer](#) () override
- bool [BasicApplicationLevelConfidentialityProfile](#) (bool deidentify=true)
- bool [Clear](#) ([PrivateTag](#) const &pt)
- bool [Clear](#) ([Tag](#) const &t)  
*Identical to 'Empty' except no action is done when tag is not present.*
- bool [Empty](#) ([PrivateTag](#) const &pt)
- bool [Empty](#) ([Tag](#) const &t)  
*Make [Tag](#) t empty (if not found tag will be created)*
- const [CryptographicMessageSyntax](#) \* [GetCryptographicMessageSyntax](#) () const
- [File](#) & [GetFile](#) ()
- bool [Remove](#) ([PrivateTag](#) const &pt)
- bool [Remove](#) ([Tag](#) const &t)  
*remove a tag (even a SQ can be removed)*
- bool [RemoveGroupLength](#) ()  
*Main function that loop over all elements and remove group length.*
- bool [RemovePrivateTags](#) ()

*Main function that loop over all elements and remove private tags.*

- bool [RemoveRetired](#) ()

*Main function that loop over all elements and remove retired element.*

- bool [Replace](#) ([PrivateTag](#) const &t, const char \*value)
- bool [Replace](#) ([PrivateTag](#) const &t, const char \*value, [VL](#) const &vl)
- bool [Replace](#) ([Tag](#) const &t, const char \*value)
- bool [Replace](#) ([Tag](#) const &t, const char \*value, [VL](#) const &vl)
- void [SetCryptographicMessageSyntax](#) ([CryptographicMessageSyntax](#) \*cms)

*Set/Get CMS key that will be used to encrypt the dataset within BasicApplicationLevelConfidentialityProfile.*

- void [SetFile](#) (const [File](#) &f)

*Set/Get File.*

## Static Public Member Functions

- static void [ClearInternalUIDs](#) ()
- static std::vector< [Tag](#) > [GetBasicApplicationLevelConfidentialityProfileAttributes](#) ()

*Return the list of [Tag](#) that will be considered when anonymizing a DICOM file.*

- static [SmartPointer](#)< [Anonymizer](#) > [New](#) ()

*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- bool [BALCPPProtect](#) ([DataSet](#) &ds, [Tag](#) const &tag, const [IOD](#) &iod)
- bool [CanEmptyTag](#) ([Tag](#) const &tag, const [IOD](#) &iod) const
- void [RecurseDataSet](#) ([DataSet](#) &ds)

### 10.8.1 Detailed Description

[Anonymizer](#).

This class is a multi purpose anonymizer. It can work in 2 mode:

- Full (irreversible) anonymizer (aka dumb mode)
- reversible de-identifier/re-identifier (aka smart mode). This implements the Basic Application Level Confidentiality Profile, DICOM PS 3.15-2009

1. dumb mode This is a dumb anonymizer implementation. All it allows user is simple operation such as:

[Tag](#) based functions:

- complete removal of DICOM attribute (Remove)
- make a tag empty, ie make it's length 0 (Empty)
- replace with another string-based value (Replace)

[DataSet](#) based functions:

- Remove all group length attribute from a DICOM dataset (Group Length element are deprecated, DICOM 2008)
- Remove all private attributes
- Remove all retired attributes

All function calls actually execute the user specified request. Previous implementation were calling a general Anonymize function but traversing a `std::set` is  $O(n)$  operation, while a simple user specified request is  $O(\log(n))$  operation. So 'm' user interaction is  $O(m*\log(n))$  which is  $< O(n)$  complexity.

1. smart mode this mode implements the Basic Application Level Confidentiality Profile (DICOM PS 3.15-2008) In this case, it is extremely important to use the same [Anonymizer](#) class when anonymizing a [FileSet](#). Once the [Anonymizer](#) is destroyed its memory of known (already processed) [UIDs](#) will be lost. which will make the anonymizer behaves incorrectly for attributes such as [Series](#) UID [Study](#) UID where user want some consistency. When attribute is [Type 1](#) / [Type 1C](#), a dummy generator will take in the existing value and produce a dummy value (a sha1 representation). sha1 algorithm is considered to be cryptographically strong (compared to md5sum) so that we meet the following two conditions:

- Produce the same dummy value for the same input value
- do not provide an easy way to retrieve the original value from the sha1 generated value

This class implement the Subject/Observer pattern trigger the following event:

- [AnonymizeEvent](#)
- [IterationEvent](#)
- [StartEvent](#)
- [EndEvent](#)

See also

[CryptographicMessageSyntax](#)

Examples

[BasicAnonymizer.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [ManipulateFile.cs](#), and [MpegVideoInfo.cs](#).

## 10.8.2 Constructor & Destructor Documentation

### 10.8.2.1 Anonymizer()

```
gdcm::Anonymizer::Anonymizer ( ) [inline]
```

### 10.8.2.2 ~Anonymizer()

```
gdcm::Anonymizer::~~Anonymizer ( ) [override]
```

## 10.8.3 Member Function Documentation

### 10.8.3.1 BALCPPProtect()

```
bool gdcm::Anonymizer::BALCPPProtect (
    DataSet & ds,
    Tag const & tag,
    const IOD & iod ) [protected]
```

### 10.8.3.2 BasicApplicationLevelConfidentialityProfile()

```
bool gdcm::Anonymizer::BasicApplicationLevelConfidentialityProfile (
    bool deidentify = true )
```

PS 3.15 / E.1.1 De-Identifier An Application may claim conformance to the Basic Application Level Confidentiality Profile as a deidentifier if it protects all Attributes that might be used by unauthorized entities to identify the patient. NOT THREAD SAFE

#### Examples

[BasicAnonymizer.cs](#).

### 10.8.3.3 CanEmptyTag()

```
bool gdcm::Anonymizer::CanEmptyTag (
    Tag const & tag,
    const IOD & iod ) const [protected]
```

### 10.8.3.4 Clear() [1/2]

```
bool gdcm::Anonymizer::Clear (
    PrivateTag const & pt )
```

### 10.8.3.5 Clear() [2/2]

```
bool gdcM::Anonymizer::Clear (
    Tag const & t )
```

Identical to 'Empty' except no action is done when tag is not present.

### 10.8.3.6 ClearInternalUIDs()

```
static void gdcM::Anonymizer::ClearInternalUIDs ( ) [static]
```

Clear the internal mapping of real [UIDs](#) to generated [UIDs](#)

#### Warning

the mapping is definitely lost

### 10.8.3.7 Empty() [1/2]

```
bool gdcM::Anonymizer::Empty (
    PrivateTag const & pt )
```

Make [PrivateTag](#) pt empty (if not found tag will be created) Pay special attention that this code must be done before any call to Empty/Remove of the associated Private Creator, but before any call to Replace.

### 10.8.3.8 Empty() [2/2]

```
bool gdcM::Anonymizer::Empty (
    Tag const & t )
```

Make [Tag](#) t empty (if not found tag will be created)

#### Examples

[CreateJPIPDataSet.cxx](#).

### 10.8.3.9 GetBasicApplicationLevelConfidentialityProfileAttributes()

```
static std::vector< Tag > gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes ( ) [static]
```

Return the list of [Tag](#) that will be considered when anonymizing a DICOM file.

#### Examples

[GenFakeIdentifyFile.cxx](#), and [TraverseModules.cxx](#).

### 10.8.3.10 GetCryptographicMessageSyntax()

```
const CryptographicMessageSyntax * gdcm::Anonymizer::GetCryptographicMessageSyntax ( ) const
```

### 10.8.3.11 GetFile()

```
File & gdcm::Anonymizer::GetFile ( ) [inline]
```

#### Examples

[BasicAnonymizer.cs](#), and [ManipulateFile.cs](#).

### 10.8.3.12 New()

```
static SmartPointer< Anonymizer > gdcm::Anonymizer::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.8.3.13 RecurseDataSet()

```
void gdcM::Anonymizer::RecurseDataSet (
    DataSet & ds ) [protected]
```

### 10.8.3.14 Remove() [1/2]

```
bool gdcM::Anonymizer::Remove (
    PrivateTag const & pt )
```

remove a private tag (even a SQ can be removed) Pay special attention that this code must be done before any call to Empty/Remove of the associated Private Creator, but before any call to Replace. When the private reservation becomes empty, no check is done to automatically remove the private creator

### 10.8.3.15 Remove() [2/2]

```
bool gdcM::Anonymizer::Remove (
    Tag const & t )
```

remove a tag (even a SQ can be removed)

### 10.8.3.16 RemoveGroupLength()

```
bool gdcM::Anonymizer::RemoveGroupLength ( )
```

Main function that loop over all elements and remove group length.

#### Examples

[ClinicalTrialAnnotate.cxx](#), and [ManipulateFile.cs](#).

### 10.8.3.17 RemovePrivateTags()

```
bool gdcM::Anonymizer::RemovePrivateTags ( )
```

Main function that loop over all elements and remove private tags.

#### Examples

[ClinicalTrialAnnotate.cxx](#), and [ManipulateFile.cs](#).



### 10.8.3.18 RemoveRetired()

```
bool gdcm::Anonymizer::RemoveRetired ( )
```

Main function that loop over all elements and remove retired element.

### 10.8.3.19 Replace() [1/4]

```
bool gdcm::Anonymizer::Replace (
    PrivateTag const & t,
    const char * value )
```

### 10.8.3.20 Replace() [2/4]

```
bool gdcm::Anonymizer::Replace (
    PrivateTag const & t,
    const char * value,
    VL const & vl )
```

### 10.8.3.21 Replace() [3/4]

```
bool gdcm::Anonymizer::Replace (
    Tag const & t,
    const char * value )
```

Replace tag with another value, if tag is not found it will be created: WARNING: this function can only execute if tag is a VRASCII

#### Examples

[ClinicalTrialAnnotate.cxx](#), [CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [ManipulateFile.cs](#), and [MpegVideoInfo.cs](#).

### 10.8.3.22 Replace() [4/4]

```
bool gdcm::Anonymizer::Replace (
    Tag const & t,
    const char * value,
    VL const & vl )
```

when the value contains \0, it is a good idea to specify the length. This function is required when dealing with VRBINARY tag

### 10.8.3.23 SetCryptographicMessageSyntax()

```
void gdcM::Anonymizer::SetCryptographicMessageSyntax (
    CryptographicMessageSyntax * cms )
```

Set/Get CMS key that will be used to encrypt the dataset within BasicApplicationLevelConfidentialityProfile.

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.8.3.24 SetFile()

```
void gdcM::Anonymizer::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

#### Examples

[BasicAnonymizer.cs](#), [ClinicalTrialAnnotate.cxx](#), [CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [ManipulateFile.cs](#), and [MpegVideoInfo.cs](#).

The documentation for this class was generated from the following file:

- [gdcMAnonymizer.h](#)

## 10.9 gdcM::AnyEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::AnyEvent:

Collaboration diagram for gdcM::AnyEvent:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcMEvent.h](#)

## 10.10 gdcm::network::ApplicationContext Class Reference

[ApplicationContext.](#)

```
#include <gdcmApplicationContext.h>
```

### Public Member Functions

- [ApplicationContext](#) ()
- const char \* [GetName](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetName](#) (const char \*name)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.10.1 Detailed Description

[ApplicationContext.](#)

[Table](#) 9-12 APPLICATION CONTEXT ITEM FIELDS

**Todo** Looks like Application Context can only be 64 bytes at max (see Figure 9-1 / PS 3.8 - 2009 )

### 10.10.2 Constructor & Destructor Documentation

#### 10.10.2.1 ApplicationContext()

```
gdcm::network::ApplicationContext::ApplicationContext ( )
```

### 10.10.3 Member Function Documentation

#### 10.10.3.1 GetName()

```
const char * gdcm::network::ApplicationContext::GetName ( ) const [inline]
```

### 10.10.3.2 Print()

```
void gdcM::network::ApplicationContext::Print (
    std::ostream & os ) const
```

### 10.10.3.3 Read()

```
std::istream & gdcM::network::ApplicationContext::Read (
    std::istream & is )
```

### 10.10.3.4 SetName()

```
void gdcM::network::ApplicationContext::SetName (
    const char * name ) [inline]
```

### 10.10.3.5 Size()

```
size_t gdcM::network::ApplicationContext::Size ( ) const
```

### 10.10.3.6 Write()

```
const std::ostream & gdcM::network::ApplicationContext::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcMApplicationContext.h](#)

## 10.11 gdcM::ApplicationEntity Class Reference

[ApplicationEntity](#).

```
#include <gdcMApplicationEntity.h>
```

Collaboration diagram for gdcM::ApplicationEntity:

## Public Member Functions

- bool [IsValid](#) () const
- void [Print](#) (std::ostream &os) const
- void [SetBlob](#) (const std::vector< char > &v)
- void [Squeeze](#) ()

## Public Attributes

- std::string [Internal](#)

## Static Public Attributes

- static const unsigned int [MaxLength](#) = 16
- static const unsigned int [MaxNumberOfComponents](#) = 1
- static const char [Padding](#) = ''
- static const char [Separator](#) = ''

### 10.11.1 Detailed Description

[ApplicationEntity](#).

- AE Application Entity
- A string of characters that identifies an Application Entity with leading and trailing spaces (20H) being non-significant. A value consisting solely of spaces shall not be used.
- Default Character Repertoire excluding character code 5CH (the BACKSLASH \ in ISO-IR 6), and control characters LF, FF, CR and ESC.
- 16 bytes maximum

### 10.11.2 Member Function Documentation

#### 10.11.2.1 IsValid()

```
bool gdcm::ApplicationEntity::IsValid ( ) const [inline]
```

#### 10.11.2.2 Print()

```
void gdcm::ApplicationEntity::Print (
    std::ostream & os ) const [inline]
```

#### 10.11.2.3 SetBlob()

```
void gdcm::ApplicationEntity::SetBlob (
    const std::vector< char > & v ) [inline]
```

#### 10.11.2.4 Squeeze()

```
void gdcm::ApplicationEntity::Squeeze ( ) [inline]
```

### 10.11.3 Member Data Documentation

#### 10.11.3.1 Internal

```
std::string gdcm::ApplicationEntity::Internal
```

#### 10.11.3.2 MaxLength

```
const unsigned int gdcm::ApplicationEntity::MaxLength = 16 [static]
```

#### 10.11.3.3 MaxNumberOfComponents

```
const unsigned int gdcm::ApplicationEntity::MaxNumberOfComponents = 1 [static]
```

#### 10.11.3.4 Padding

```
const char gdcmm::ApplicationEntity::Padding = ' ' [static]
```

#### 10.11.3.5 Separator

```
const char gdcmm::ApplicationEntity::Separator = ' ' [static]
```

The documentation for this class was generated from the following file:

- [gdcmmApplicationEntity.h](#)

## 10.12 gdcmm::network::AReleaseRPPDU Class Reference

[AReleaseRPPDU](#).

```
#include <gdcmmAReleaseRPPDU.h>
```

Inheritance diagram for gdcmm::network::AReleaseRPPDU:

Collaboration diagram for gdcmm::network::AReleaseRPPDU:

### Public Member Functions

- [AReleaseRPPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

### 10.12.1 Detailed Description

[AReleaseRPPDU](#).

[Table](#) 9-25 A-RELEASE-RP PDU fields

### 10.12.2 Constructor & Destructor Documentation

### 10.12.2.1 AReleaseRPPDU()

```
gdcmm::network::AReleaseRPPDU::AReleaseRPPDU ( )
```

## 10.12.3 Member Function Documentation

### 10.12.3.1 IsLastFragment()

```
bool gdcmm::network::AReleaseRPPDU::IsLastFragment ( ) const [inline], [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.12.3.2 Print()

```
void gdcmm::network::AReleaseRPPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.12.3.3 Read()

```
std::istream & gdcmm::network::AReleaseRPPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

### 10.12.3.4 Size()

```
size_t gdcmm::network::AReleaseRPPDU::Size ( ) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).



### 10.12.3.5 Write()

```
const std::ostream & gdcmm::network::AReleaseRPPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcmm::network::BasePDU](#).

The documentation for this class was generated from the following file:

- [gdcmmAReleaseRPPDU.h](#)

## 10.13 gdcmm::network::AReleaseRQPDU Class Reference

[AReleaseRQPDU](#).

```
#include <gdcmmAReleaseRQPDU.h>
```

Inheritance diagram for gdcmm::network::AReleaseRQPDU:

Collaboration diagram for gdcmm::network::AReleaseRQPDU:

### Public Member Functions

- [AReleaseRQPDU](#) ()
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

### 10.13.1 Detailed Description

[AReleaseRQPDU](#).

[Table 9-24](#) A-RELEASE-RQ PDU FIELDS

### 10.13.2 Constructor & Destructor Documentation

#### 10.13.2.1 AReleaseRQPDU()

```
gdcmm::network::AReleaseRQPDU::AReleaseRQPDU ( )
```

### 10.13.3 Member Function Documentation

#### 10.13.3.1 IsLastFragment()

```
bool gdcn::network::AReleaseRQPDU::IsLastFragment ( ) const [inline], [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.13.3.2 Print()

```
void gdcn::network::AReleaseRQPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.13.3.3 Read()

```
std::istream & gdcn::network::AReleaseRQPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.13.3.4 Size()

```
size_t gdcn::network::AReleaseRQPDU::Size ( ) const [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

#### 10.13.3.5 Write()

```
const std::ostream & gdcn::network::AReleaseRQPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcn::network::BasePDU](#).

The documentation for this class was generated from the following file:

- [gdcnAReleaseRQPDU.h](#)

## 10.14 gdcm::network::ARTIMTimer Class Reference

[ARTIMTimer](#).

```
#include <gdcmARTIMTimer.h>
```

### Public Member Functions

- [ARTIMTimer](#) ()
- double [GetElapsedTime](#) () const
- bool [GetHasExpired](#) () const
- double [GetTimeout](#) () const
- void [SetTimeout](#) (double inTimeout)
- void [Start](#) ()
- void [Stop](#) ()

### 10.14.1 Detailed Description

[ARTIMTimer](#).

This file contains the code for the ARTIM timer.

Basically, the ARTIM timer will just get the wall time when it's started, and then can be queried for the current time, and then can be stopped (ie, the start time reset).

Because we're trying to do this without threading, we should be able to 'start' the ARTIM timer by this mechanism, and then when waiting for a particular response, tight loop that with sleep calls and determinations of when the ARTIM timer has reached its peak. As such, this isn't a strict 'timer' in the traditional sense of the word, but more of a time keeper.

There can be only one ARTIM timer per connection.

### 10.14.2 Constructor & Destructor Documentation

#### 10.14.2.1 ARTIMTimer()

```
gdcm::network::ARTIMTimer::ARTIMTimer ( )
```

### 10.14.3 Member Function Documentation

#### 10.14.3.1 GetElapsedTime()

```
double gdcM::network::ARTIMTimer::GetElapsedTime ( ) const
```

#### 10.14.3.2 GetHasExpired()

```
bool gdcM::network::ARTIMTimer::GetHasExpired ( ) const
```

#### 10.14.3.3 GetTimeout()

```
double gdcM::network::ARTIMTimer::GetTimeout ( ) const
```

#### 10.14.3.4 SetTimeout()

```
void gdcM::network::ARTIMTimer::SetTimeout (
    double inTimeout )
```

#### 10.14.3.5 Start()

```
void gdcM::network::ARTIMTimer::Start ( )
```

#### 10.14.3.6 Stop()

```
void gdcM::network::ARTIMTimer::Stop ( )
```

The documentation for this class was generated from the following file:

- [gdcMARTIMTimer.h](#)

## 10.15 gdcM::ASN1 Class Reference

Class for [ASN1](#).

```
#include <gdcMASN1.h>
```

## Public Member Functions

- [ASN1](#) ()
- [ASN1](#) (const [ASN1](#) &)=delete
- [~ASN1](#) ()
- void [operator=](#) (const [ASN1](#) &)=delete

## Static Public Member Functions

- static bool [ParseDump](#) (const char \*array, size\_t length)
- static bool [ParseDumpFile](#) (const char \*filename)

## Protected Member Functions

- int [TestPBKDF2](#) ()

### 10.15.1 Detailed Description

Class for [ASN1](#).

### 10.15.2 Constructor & Destructor Documentation

#### 10.15.2.1 [ASN1\(\)](#) [1/2]

```
gdcm::ASN1::ASN1 ( )
```

#### 10.15.2.2 [~ASN1\(\)](#)

```
gdcm::ASN1::~~ASN1 ( )
```

#### 10.15.2.3 [ASN1\(\)](#) [2/2]

```
gdcm::ASN1::ASN1 (
    const ASN1 & ) [delete]
```

### 10.15.3 Member Function Documentation

#### 10.15.3.1 operator=()

```
void gdcm::ASN1::operator= (
    const ASN1 & ) [delete]
```

#### 10.15.3.2 ParseDump()

```
static bool gdcm::ASN1::ParseDump (
    const char * array,
    size_t length ) [static]
```

#### 10.15.3.3 ParseDumpFile()

```
static bool gdcm::ASN1::ParseDumpFile (
    const char * filename ) [static]
```

#### 10.15.3.4 TestPBKDF2()

```
int gdcm::ASN1::TestPBKDF2 ( ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmASN1.h](#)

## 10.16 gdcm::network::AsynchronousOperationsWindowSub Class Reference

[AsynchronousOperationsWindowSub](#).

```
#include <gdcmAsynchronousOperationsWindowSub.h>
```

## Public Member Functions

- [AsynchronousOperationsWindowSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.16.1 Detailed Description

[AsynchronousOperationsWindowSub](#).

PS 3.7 [Table D.3-7](#) ASYNCHRONOUS OPERATIONS WINDOW SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 10.16.2 Constructor & Destructor Documentation

#### 10.16.2.1 AsynchronousOperationsWindowSub()

```
gdcm::network::AsynchronousOperationsWindowSub::AsynchronousOperationsWindowSub ( )
```

### 10.16.3 Member Function Documentation

#### 10.16.3.1 Print()

```
void gdcm::network::AsynchronousOperationsWindowSub::Print (
    std::ostream & os ) const
```

#### 10.16.3.2 Read()

```
std::istream & gdcm::network::AsynchronousOperationsWindowSub::Read (
    std::istream & is )
```

### 10.16.3.3 Size()

```
size_t gdcM::network::AsynchronousOperationsWindowSub::Size ( ) const
```

### 10.16.3.4 Write()

```
const std::ostream & gdcM::network::AsynchronousOperationsWindowSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcMAsynchronousOperationsWindowSub.h](#)

## 10.17 gdcM::Attribute< Group, Element, TVR, TVM > Class Template Reference

[Attribute](#) class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.

```
#include <gdcMAttribute.h>
```

Collaboration diagram for gdcM::Attribute< Group, Element, TVR, TVM >:

### Public Types

- enum { [VMType](#) = VMToLength<TVM>::Length }
- typedef [VRToType](#)< TVR >::Type [ArrayType](#)

### Public Member Functions

- [GDCM\\_STATIC\\_ASSERT](#) (((((VR::VRType) TVR & VR::VR\_VM1) && ((VM::VMType) TVM == VM::VM1)) || !((VR::VRType) TVR & VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VM::VMType) TVM & (VM::VMType)(TagToType< Group, [Element](#) >::VMType)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR & (VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [DataElement](#) GetAsDataElement () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v, unsigned int idx=0)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel=[VMType](#))



## Static Public Member Functions

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

## Public Attributes

- [ArrayType Internal](#) [[VMToLength](#)< TVM >::Length]

## Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

### 10.17.1 Detailed Description

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int TVM = TagToType<Group, Element>::VMType>
class gdcm::Attribute< Group, Element, TVR, TVM >
```

[Attribute](#) class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.

Typical example that compile is: `Attribute<0x0008,0x9007> a = {"ORIGINAL","PRIMARY","T1","NONE"};`

Examples that will NOT compile are:

`Attribute<0x0018,0x1182, VR::IS, VM::VM1> fd1 = {};` // not enough parameters  
`Attribute<0x0018,0x1182, VR::IS, VM::VM2> fd2 = {0,1,2};` // too many initializers  
`Attribute<0x0018,0x1182, VR::IS, VM::VM3> fd3 = {0,1,2};` // VM3 is not valid  
`Attribute<0x0018,0x1182, VR::UL, VM::VM2> fd3 = {0,1};` // UL is not valid [VR](#)

#### Examples

[CreateFakeRTDOSE.cxx](#), [CreateJPIPDataset.cxx](#), [DeriveSeries.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_In](#), [FixOrientation.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetSequenceUltrasound.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [SortImage.cxx](#), [StreamImageReaderTest.cxx](#), [VolumeSorter.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.17.2 Member Typedef Documentation

### 10.17.2.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
typedef VRToType<TVR>::Type gdcml::Attribute< Group, Element, TVR, TVM >::ArrayType
```

## 10.17.3 Member Enumeration Documentation

### 10.17.3.1 anonymous enum

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
anonymous enum
```

#### Enumerator

VMType	
--------	--

## 10.17.4 Member Function Documentation

### 10.17.4.1 GDCM\_STATIC\_ASSERT() [1/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcml::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    (((VR::VRType) TVR &VR::VR_VM1) && ((VM::VMType) TVM==VM::VM1)) || ((VR::VRType) TVR
&VR::VR_VM1)) )
```

### 10.17.4.2 GDCM\_STATIC\_ASSERT() [2/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcml::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VM::VMType) TVM &(VM::VMType) (TagToType< Group, Element >::VMType)) )
```

#### 10.17.4.3 GDCM\_STATIC\_ASSERT() [3/3]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
gdcm::Attribute< Group, Element, TVR, TVM >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

#### 10.17.4.4 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
DataElement gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement ( ) const [inline]
```

##### Examples

[CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixOrientation.cxx](#), [GenFakeIdentifyFile.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [PatchFile.cxx](#), and [StreamImageReaderTest.cxx](#).

References [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), and [gdcm::DataElement::SetVR\(\)](#).

#### 10.17.4.5 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VM gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVM ( ) [inline], [static]
```

#### 10.17.4.6 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VR gdcm::Attribute< Group, Element, TVR, TVM >::GetDictVR ( ) [inline], [static]
```

#### 10.17.4.7 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
unsigned int gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues ( ) const [inline]
```

##### Examples

[LargeVRDSExplicit.cxx](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::operator<\(\)>](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator<\(\)>](#).

#### 10.17.4.8 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static Tag gdcm::Attribute< Group, Element, TVR, TVM >::GetTag ( ) [inline], [static]
```

##### Examples

[PatchFile.cxx](#), [ReadAndPrintAttributes.cxx](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

#### 10.17.4.9 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0 ) [inline]
```

##### Examples

[DeriveSeries.cxx](#), [FixOrientation.cxx](#), [GetSequenceUltrasound.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

#### 10.17.4.10 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType const & gdcm::Attribute< Group, Element, TVR, TVM >::GetValue (
    unsigned int idx = 0 ) const [inline]
```

#### 10.17.4.11 GetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
const ArrayType * gdcm::Attribute< Group, Element, TVR, TVM >::GetValues ( ) const [inline]
```

#### Examples

[FixOrientation.cxx](#), [LargeVRDSExplicit.cxx](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::operator!=\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator!=\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::operator<\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator<\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::operator==\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator==\(\)](#).

#### 10.17.4.12 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VM gdcm::Attribute< Group, Element, TVR, TVM >::GetVM ( ) [inline], [static]
```

#### 10.17.4.13 GetVR()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
static VR gdcm::Attribute< Group, Element, TVR, TVM >::GetVR ( ) [inline], [static]
```

#### 10.17.4.14 operator"!="()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcm::Attribute< Group, Element, TVR, TVM >::operator!= (
    const Attribute< Group, Element, TVR, TVM > & att ) const [inline]
```

References [gdcm::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#).

**10.17.4.15 operator<>()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator< (
    const Attribute< Group, Element, TVR, TVM > & att ) const [inline]
```

References [gdcM::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues\(\)](#), and [gdcM::Attribute< Group, Element, TVR, TVM >](#)

**10.17.4.16 operator==(())**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
bool gdcM::Attribute< Group, Element, TVR, TVM >::operator==( (
    const Attribute< Group, Element, TVR, TVM > & att ) const [inline]
```

References [gdcM::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#).

**10.17.4.17 operator[]() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType & gdcM::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx ) [inline]
```

**10.17.4.18 operator[]() [2/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType const & gdcM::Attribute< Group, Element, TVR, TVM >::operator[] (
    unsigned int idx ) const [inline]
```

**10.17.4.19 Print()**

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcM::Attribute< Group, Element, TVR, TVM >::Print (
    std::ostream & os ) const [inline]
```

#### 10.17.4.20 Set()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::Set (
    DataSet const & ds ) [inline]
```

##### Examples

[LargeVRDSExplicit.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

References [gdcm::DataSet::GetDataElement\(\)](#).

#### 10.17.4.21 SetByteValue()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue (
    const ByteValue * bv ) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), and [gdcm::ByteValue::GetPointer\(\)](#).

#### 10.17.4.22 SetByteValueNoSwap()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap (
    const ByteValue * bv ) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), and [gdcm::ByteValue::GetPointer\(\)](#).

#### 10.17.4.23 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement (
    DataElement const & de ) [inline]
```

##### Examples

[GetSequenceUltrasound.cxx](#), [LargeVRDSExplicit.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [gdcmrtionplan.cxx](#),  
and [gdcmrtplan.cxx](#).

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [gdcm::DataElement::GetVR\(\)](#), and  
[gdcm::DataElement::IsEmpty\(\)](#).

#### 10.17.4.24 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet (
    DataSet const & ds ) [inline]
```

##### Examples

[DeriveSeries.cxx](#), [FixOrientation.cxx](#), [ReadAndPrintAttributes.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [gdcm::DataSet::FindDataElement\(\)](#), and [gdcm::DataSet::GetDataElement\(\)](#).

#### 10.17.4.25 SetValue()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValue (
    ArrayType v,
    unsigned int idx = 0 ) [inline]
```

##### Examples

[CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [FixOrientation.cxx](#), [HelloWorld.cxx](#), [LargeVRDSEExplicit.cxx](#), and [PatchFile.cxx](#).

#### 10.17.4.26 SetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
void gdcm::Attribute< Group, Element, TVR, TVM >::SetValues (
    const ArrayType * array,
    unsigned int numel = VMType ) [inline]
```

##### Examples

[FixOrientation.cxx](#), and [LargeVRDSEExplicit.cxx](#).

### 10.17.5 Member Data Documentation



### 10.17.5.1 Internal

```
template<uint16_t Group, uint16_t Element, long long TVR = TagToType<Group, Element>::VRType, int
TVM = TagToType<Group, Element>::VMType>
ArrayType gdcm::Attribute< Group, Element, TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.18 gdcm::Attribute< Group, Element, TVR, VM::VM1 > Class Template Reference

```
#include <gdcmAttribute.h>
```

Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1 >:

### Public Types

- enum { [VMType](#) = VMToLength<VM::VM1>::Length }
- typedef [VRToType](#)< TVR >::Type [ArrayType](#)

### Public Member Functions

- [GDCM\\_STATIC\\_ASSERT](#) (((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) VM::VM1==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VM::VMType) VM::VM1 &(VM::VMType)(TagToType< Group, Element >::VMType)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, Element >::VRType)))
- [GDCM\\_STATIC\\_ASSERT](#) (VMToLength< VM::VM1 >::Length==1)
- [DataElement](#) GetAsDataElement () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) ()
- [ArrayType](#) const & [GetValue](#) () const
- const [ArrayType](#) \* [GetValues](#) () const
- bool [operator!=](#) (const [Attribute](#) &att) const
- bool [operator<](#) (const [Attribute](#) &att) const
- bool [operator==](#) (const [Attribute](#) &att) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetValue](#) ([ArrayType](#) v)

## Static Public Member Functions

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

## Public Attributes

- [ArrayType](#) Internal

## Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)
- void [SetByteValueNoSwap](#) (const [ByteValue](#) \*bv)

## 10.18.1 Member Typedef Documentation

### 10.18.1.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR>
typedef VRToType<TVR>::Type gdc::Attribute< Group, Element, TVR, VM::VM1 >::ArrayType
```

## 10.18.2 Member Enumeration Documentation

### 10.18.2.1 anonymous enum

```
template<uint16_t Group, uint16_t Element, long long TVR>
anonymous enum
```

#### Enumerator

<a href="#">VMType</a>	
------------------------	--

### 10.18.3 Member Function Documentation

#### 10.18.3.1 GDCM\_STATIC\_ASSERT() [1/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    (((VR::VRType) TVR & VR::VR_VM1) && ((VM::VMType) VM::VM1==VM::VM1)) || !((VR::VRType)
TVR & VR::VR_VM1)) )
```

#### 10.18.3.2 GDCM\_STATIC\_ASSERT() [2/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    ((VM::VMType) VM::VM1 & (VM::VMType) (TagToType< Group, Element >::VMType)) )
```

#### 10.18.3.3 GDCM\_STATIC\_ASSERT() [3/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

#### 10.18.3.4 GDCM\_STATIC\_ASSERT() [4/4]

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GDCM_STATIC_ASSERT (
    VMToLength< VM::VM1 >::Length == 1 )
```

#### 10.18.3.5 GetAsDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
DataElement gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement ( ) const [inline]
```

References [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), and [gdcm::DataElement::SetVR\(\)](#).

### 10.18.3.6 GetDictVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetDictVM ( ) [inline], [static]
```

### 10.18.3.7 GetDictVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetDictVR ( ) [inline], [static]
```

### 10.18.3.8 GetNumberOfValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
unsigned int gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetNumberOfValues ( ) const [inline]
```

### 10.18.3.9 GetTag()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static Tag gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetTag ( ) [inline], [static]
```

### 10.18.3.10 GetValue() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType & gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetValue ( ) [inline]
```

### 10.18.3.11 GetValue() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const & gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetValue ( ) const [inline]
```

### 10.18.3.12 GetValues()

```
template<uint16_t Group, uint16_t Element, long long TVR>
const ArrayType * gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetValues ( ) const [inline]
```

### 10.18.3.13 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetVM ( ) [inline], [static]
```

### 10.18.3.14 GetVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetVR ( ) [inline], [static]
```

### 10.18.3.15 operator"!="()

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator!= (
    const Attribute< Group, Element, TVR, VM::VM1 > & att ) const [inline]
```

References [gdcm::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#).

### 10.18.3.16 operator<()

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcm::Attribute< Group, Element, TVR, VM::VM1 >::operator< (
    const Attribute< Group, Element, TVR, VM::VM1 > & att ) const [inline]
```

References [gdcm::Attribute< Group, Element, TVR, TVM >::GetNumberOfValues\(\)](#), and [gdcm::Attribute< Group, Element, TVR, TVM >](#)

**10.18.3.17 operator==( )**

```
template<uint16_t Group, uint16_t Element, long long TVR>
bool gdcM::Attribute< Group, Element, TVR, VM::VM1 >::operator==(
    const Attribute< Group, Element, TVR, VM::VM1 > & att ) const [inline]
```

References [gdcM::Attribute< Group, Element, TVR, TVM >::GetValues\(\)](#).

**10.18.3.18 Print()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1 >::Print (
    std::ostream & os ) const [inline]
```

**10.18.3.19 Set()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1 >::Set (
    DataSet const & ds ) [inline]
```

References [gdcM::DataSet::GetDataElement\(\)](#).

**10.18.3.20 SetByteValue()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue (
    const ByteValue * bv ) [inline], [protected]
```

References [gdcM::ByteValue::GetLength\(\)](#), and [gdcM::ByteValue::GetPointer\(\)](#).

**10.18.3.21 SetByteValueNoSwap()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValueNoSwap (
    const ByteValue * bv ) [inline], [protected]
```

References [gdcM::ByteValue::GetLength\(\)](#), and [gdcM::ByteValue::GetPointer\(\)](#).

### 10.18.3.22 SetFromDataElement()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement (
    DataElement const & de ) [inline]
```

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [gdcm::DataElement::GetVR\(\)](#), and [gdcm::DataElement::IsEmpty\(\)](#).

### 10.18.3.23 SetFromDataSet()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet (
    DataSet const & ds ) [inline]
```

References [gdcm::DataSet::FindDataElement\(\)](#), and [gdcm::DataSet::GetDataElement\(\)](#).

### 10.18.3.24 SetValue()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetValue (
    ArrayType v ) [inline]
```

## 10.18.4 Member Data Documentation

### 10.18.4.1 Internal

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType gdcm::Attribute< Group, Element, TVR, VM::VM1 >::Internal
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.19 `gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >` Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >`:

Collaboration diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >`:

### Public Member Functions

- [VM GetVM](#) () const

### Additional Inherited Members

#### 10.19.1 Member Function Documentation

##### 10.19.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>  
VM gdcm::Attribute< Group, Element, TVR, VM::VM1_3 >::GetVM ( ) const [inline]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.20 `gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >` Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >`:

Collaboration diagram for `gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >`:

### Public Member Functions

- [VM GetVM](#) () const



## Additional Inherited Members

### 10.20.1 Member Function Documentation

#### 10.20.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcm::Attribute< Group, Element, TVR, VM::VM1_8 >::GetVM ( ) const [inline]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.21 gdcm::Attribute< Group, Element, TVR, VM::VM1\_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM1\_n >:

### Public Types

- typedef [VRToType](#)< TVR >::Type [ArrayType](#)

### Public Member Functions

- [Attribute](#) ()
- [~Attribute](#) ()
- [GDCM\\_STATIC\\_ASSERT](#) (((((VR::VRType) TVR &VR::VR\_VM1) &&((VM::VMType) TagToType< Group, [Element](#) >::VMType==VM::VM1))||!((VR::VRType) TVR &VR::VR\_VM1)))
- [GDCM\\_STATIC\\_ASSERT](#) (((VR::VRType) TVR &(VR::VRType)(TagToType< Group, [Element](#) >::VRType)))
- [GDCM\\_STATIC\\_ASSERT](#) ((VM::VM1\_n &(VM::VMType)(TagToType< Group, [Element](#) >::VMType)))
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned int [GetNumberOfValues](#) () const
- [ArrayType](#) & [GetValue](#) (unsigned int idx=0)
- [ArrayType](#) const & [GetValue](#) (unsigned int idx=0) const
- const [ArrayType](#) \* [GetValues](#) () const
- [ArrayType](#) & [operator\[\]](#) (unsigned int idx)
- [ArrayType](#) const & [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const
- void [Set](#) ([DataSet](#) const &ds)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetFromDataSet](#) ([DataSet](#) const &ds)
- void [SetNumberOfValues](#) (unsigned int numel)
- void [SetValue](#) ([ArrayType](#) v)
- void [SetValue](#) (unsigned int idx, [ArrayType](#) v)
- void [SetValues](#) (const [ArrayType](#) \*array, unsigned int numel, bool own=false)

## Static Public Member Functions

- static [VM GetDictVM](#) ()
- static [VR GetDictVR](#) ()
- static [Tag GetTag](#) ()
- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

## Protected Member Functions

- void [SetByteValue](#) (const [ByteValue](#) \*bv)

## 10.21.1 Member Typedef Documentation

### 10.21.1.1 ArrayType

```
template<uint16_t Group, uint16_t Element, long long TVR>
typedef VRToType<TVR>::Type gdcM::Attribute< Group, Element, TVR, VM::VM1\_n >::ArrayType
```

## 10.21.2 Constructor & Destructor Documentation

### 10.21.2.1 Attribute()

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcM::Attribute< Group, Element, TVR, VM::VM1\_n >::Attribute ( ) [inline], [explicit]
```

### 10.21.2.2 ~Attribute()

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcM::Attribute< Group, Element, TVR, VM::VM1\_n >::~~Attribute ( ) [inline]
```

## 10.21.3 Member Function Documentation

**10.21.3.1 GDCM\_STATIC\_ASSERT() [1/3]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
    (((VR::VRType) TVR & VR::VR_VM1) && ((VM::VMType) TagToType< Group, Element >::VMType==VM::VM1)) || ((VR
TVR & VR::VR_VM1)) )
```

**10.21.3.2 GDCM\_STATIC\_ASSERT() [2/3]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
    ((VR::VRType) TVR & (VR::VRType) (TagToType< Group, Element >::VRType)) )
```

**10.21.3.3 GDCM\_STATIC\_ASSERT() [3/3]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GDCM_STATIC_ASSERT (
    (VM::VM1_n & (VM::VMType) (TagToType< Group, Element >::VMType)) )
```

**10.21.3.4 GetAsDataElement()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
DataElement gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetAsDataElement ( ) const [inline]
```

References [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), and [gdcm::DataElement::SetVR\(\)](#).

**10.21.3.5 GetDictVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetDictVM ( ) [inline], [static]
```

**10.21.3.6 GetDictVR()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetDictVR ( ) [inline], [static]
```

**10.21.3.7 GetNumberOfValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
unsigned int gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::GetNumberOfValues ( ) const [inline]
```

**10.21.3.8 GetTag()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
static Tag gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::GetTag ( ) [inline], [static]
```

**10.21.3.9 GetValue() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType & gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0 ) [inline]
```

**10.21.3.10 GetValue() [2/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const & gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0 ) const [inline]
```

**10.21.3.11 GetValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
const ArrayType * gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::GetValues ( ) const [inline]
```

**10.21.3.12 GetVM()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::GetVM ( ) [inline], [static]
```

### 10.21.3.13 GetVR()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VR gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::GetVR ( ) [inline], [static]
```

### 10.21.3.14 operator[]() [1/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType & gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::operator[] (
    unsigned int idx ) [inline]
```

### 10.21.3.15 operator[]() [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
ArrayType const & gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::operator[] (
    unsigned int idx ) const [inline]
```

### 10.21.3.16 Print()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Print (
    std::ostream & os ) const [inline]
```

### 10.21.3.17 Set()

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::Set (
    DataSet const & ds ) [inline]
```

References [gdcm::DataSet::GetDataElement\(\)](#).

**10.21.3.18 SetByteValue()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetByteValue (
    const ByteValue * bv ) [inline], [protected]
```

References [gdcM::ByteValue::GetLength\(\)](#), and [gdcM::ByteValue::GetPointer\(\)](#).

**10.21.3.19 SetFromDataElement()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataElement (
    DataElement const & de ) [inline]
```

References [gdcM::DataElement::GetByteValue\(\)](#), [gdcM::DataElement::GetTag\(\)](#), [gdcM::DataElement::GetVR\(\)](#), and [gdcM::DataElement::IsEmpty\(\)](#).

**10.21.3.20 SetFromDataSet()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetFromDataSet (
    DataSet const & ds ) [inline]
```

References [gdcM::DataSet::FindDataElement\(\)](#), and [gdcM::DataSet::GetDataElement\(\)](#).

**10.21.3.21 SetNumberOfValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetNumberOfValues (
    unsigned int numel ) [inline]
```

**10.21.3.22 SetValue() [1/2]**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcM::Attribute< Group, Element, TVR, VM::VM1_n >::SetValue (
    ArrayType v ) [inline]
```

References [SetValue\(\)](#).

Referenced by [SetValue\(\)](#).

**10.21.3.23 SetValue()** [2/2]

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetValue (
    unsigned int idx,
    ArrayType v ) [inline]
```

**10.21.3.24 SetValues()**

```
template<uint16_t Group, uint16_t Element, long long TVR>
void gdcm::Attribute< Group, Element, TVR, VM::VM1_n >::SetValues (
    const ArrayType * array,
    unsigned int numel,
    bool own = false ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.22 gdcm::Attribute< Group, Element, TVR, VM::VM2\_2n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM2\_2n >:

Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM2\_2n >:

**Static Public Member Functions**

- static [VM GetVM](#) ()

**Additional Inherited Members****10.22.1 Member Function Documentation**

### 10.22.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcM::Attribute< Group, Element, TVR, VM::VM2_2n >::GetVM ( ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcMAttribute.h](#)

## 10.23 gdcM::Attribute< Group, Element, TVR, VM::VM2\_n > Class Template Reference

```
#include <gdcMAttribute.h>
```

Inheritance diagram for gdcM::Attribute< Group, Element, TVR, VM::VM2\_n >:

Collaboration diagram for gdcM::Attribute< Group, Element, TVR, VM::VM2\_n >:

### Public Member Functions

- [VM GetVM](#) () const

### Additional Inherited Members

### 10.23.1 Member Function Documentation

#### 10.23.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
VM gdcM::Attribute< Group, Element, TVR, VM::VM2_n >::GetVM ( ) const [inline]
```

The documentation for this class was generated from the following file:

- [gdcMAttribute.h](#)

## 10.24 gdcM::Attribute< Group, Element, TVR, VM::VM3\_3n > Class Template Reference

```
#include <gdcMAttribute.h>
```

Inheritance diagram for gdcM::Attribute< Group, Element, TVR, VM::VM3\_3n >:

Collaboration diagram for gdcM::Attribute< Group, Element, TVR, VM::VM3\_3n >:



## Static Public Member Functions

- static [VM GetVM](#) ()

## Additional Inherited Members

### 10.24.1 Member Function Documentation

#### 10.24.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM3\_3n >::GetVM ( ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.25 gdcm::Attribute< Group, Element, TVR, VM::VM3\_n > Class Template Reference

```
#include <gdcmAttribute.h>
```

Inheritance diagram for gdcm::Attribute< Group, Element, TVR, VM::VM3\_n >:

Collaboration diagram for gdcm::Attribute< Group, Element, TVR, VM::VM3\_n >:

## Static Public Member Functions

- static [VM GetVM](#) ()

## Additional Inherited Members

### 10.25.1 Member Function Documentation

### 10.25.1.1 GetVM()

```
template<uint16_t Group, uint16_t Element, long long TVR>
static VM gdcm::Attribute< Group, Element, TVR, VM::VM3_n >::GetVM ( ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.26 gdcm::AudioCodec Class Reference

[AudioCodec.](#)

```
#include <gdcmAudioCodec.h>
```

Inheritance diagram for gdcm::AudioCodec:

Collaboration diagram for gdcm::AudioCodec:

### Public Member Functions

- [AudioCodec](#) ()
- [~AudioCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*

### Additional Inherited Members

#### 10.26.1 Detailed Description

[AudioCodec.](#)

#### 10.26.2 Constructor & Destructor Documentation

### 10.26.2.1 AudioCodec()

```
gdcm::AudioCodec::AudioCodec ( )
```

### 10.26.2.2 ~AudioCodec()

```
gdcm::AudioCodec::~~AudioCodec ( ) [override]
```

## 10.26.3 Member Function Documentation

### 10.26.3.1 CanCode()

```
bool gdcm::AudioCodec::CanCode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implements [gdcm::Coder](#).

### 10.26.3.2 CanDecode()

```
bool gdcm::AudioCodec::CanDecode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implements [gdcm::Decoder](#).

### 10.26.3.3 Decode()

```
bool gdcm::AudioCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::Decoder](#).

The documentation for this class was generated from the following file:

- [gdcmAudioCodec.h](#)

## 10.27 gdcm::Base64 Class Reference

Class for [Base64](#).

```
#include <gdcmBase64.h>
```

### Public Member Functions

- [Base64](#) (const [Base64](#) &)=delete
- void [operator=](#) (const [Base64](#) &)=delete

### Static Public Member Functions

- static size\_t [Decode](#) (char \*dst, size\_t dlen, const char \*src, size\_t slen)  
*Decode a base64-formatted buffer.*
- static size\_t [Encode](#) (char \*dst, size\_t dlen, const char \*src, size\_t slen)  
*Encode a buffer into base64 format.*
- static size\_t [GetDecodeLength](#) (const char \*src, size\_t len)
- static size\_t [GetEncodeLength](#) (const char \*src, size\_t srclen)

### 10.27.1 Detailed Description

Class for [Base64](#).

### 10.27.2 Constructor & Destructor Documentation

#### 10.27.2.1 Base64()

```
gdcm::Base64::Base64 (  
    const Base64 & ) [delete]
```

### 10.27.3 Member Function Documentation

#### 10.27.3.1 Decode()

```
static size_t gdcm::Base64::Decode (  
    char * dst,  
    size_t dlen,  
    const char * src,  
    size_t slen ) [static]
```

Decode a base64-formatted buffer.

## Parameters

<i>dst</i>	destination buffer
<i>dlen</i>	size of the buffer
<i>src</i>	source buffer
<i>slen</i>	amount of data to be decoded

## Returns

0 if not successful, size of decoded otherwise

## Examples

[DumpExamCard.cxx](#), and [DumpSiemensBase64.cxx](#).

### 10.27.3.2 Encode()

```
static size_t gdcm::Base64::Encode (
    char * dst,
    size_t dlen,
    const char * src,
    size_t slen ) [static]
```

Encode a buffer into base64 format.

## Parameters

<i>dst</i>	destination buffer
<i>dlen</i>	size of the buffer
<i>src</i>	source buffer
<i>slen</i>	amount of data to be encoded

## Returns

0 if not successful, size of encoded otherwise

### 10.27.3.3 GetDecodeLength()

```
static size_t gdcm::Base64::GetDecodeLength (
    const char * src,
    size_t len ) [static]
```

Call this function to obtain the required buffer size

## Examples

[DumpExamCard.cxx](#), and [DumpSiemensBase64.cxx](#).

### 10.27.3.4 GetEncodeLength()

```
static size_t gdcm::Base64::GetEncodeLength (
    const char * src,
    size_t srclen ) [static]
```

Call this function to obtain the required buffer size

### 10.27.3.5 operator=()

```
void gdcm::Base64::operator= (
    const Base64 & ) [delete]
```

The documentation for this class was generated from the following file:

- [gdcmBase64.h](#)

## 10.28 gdcm::network::BaseCompositeMessage Class Reference

[BaseCompositeMessage](#).

```
#include <gdcmBaseCompositeMessage.h>
```

Inheritance diagram for gdcm::network::BaseCompositeMessage:

### Public Member Functions

- virtual [~BaseCompositeMessage](#) ()=default
- virtual std::vector< [PresentationDataValue](#) > [ConstructPDV](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)=0

## 10.28.1 Detailed Description

### [BaseCompositeMessage](#).

The Composite events described in section 3.7-2009 of the DICOM standard all use their own messages. These messages are constructed using Presentation Data Values, from section 3.8-2009 of the standard, and then fill in appropriate values in their datasets.

So, for the five composites:

- C-ECHO
- C-FIND
- C-MOVE
- C-GET
- C-STORE there are a series of messages. However, all of these messages are obtained as part of a PDataPDU, and all have to be placed there. Therefore, since they all have shared functionality and construction tropes, that will be put into a base class. Further, the base class will be then returned by the factory class, `gdcmCompositePDUFactory`.

This is an abstract class. It cannot be instantiated on its own.

## 10.28.2 Constructor & Destructor Documentation

### 10.28.2.1 `~BaseCompositeMessage()`

```
virtual gdcm::network::BaseCompositeMessage::~~BaseCompositeMessage ( ) [virtual], [default]
```

## 10.28.3 Member Function Documentation

### 10.28.3.1 `ConstructPDV()`

```
virtual std::vector< PresentationDataValue > gdcm::network::BaseCompositeMessage::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [pure virtual]
```

Implemented in [gdcm::network::CEchoRQ](#), [gdcm::network::CFindRQ](#), and [gdcm::network::CMoveRQ](#).

The documentation for this class was generated from the following file:

- [gdcmBaseCompositeMessage.h](#)

## 10.29 gdcm::network::BaseNormalizedMessage Class Reference

[BaseNormalizedMessage](#).

```
#include <gdcmBaseNormalizedMessage.h>
```

Inheritance diagram for gdcm::network::BaseNormalizedMessage:

### Public Member Functions

- virtual [~BaseNormalizedMessage](#) ()=default
- virtual std::vector< [PresentationDataValue](#) > [ConstructPDV](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)=0

### 10.29.1 Detailed Description

[BaseNormalizedMessage](#).

The Normalized events described in section 3.7-2011 of the DICOM standard all use their own messages. These messages are constructed using Presentation Data Values, from section 3.8-2011 of the standard, and then fill in appropriate values in their datasets.

So, for the five normalized:

- N-ACTION
- N-CREATE
- N-DELETE
- N-EVENT
- N-GET
- N-SET there are a series of messages. However, all of these messages are obtained as part of a PData↔PDU, and all have to be placed there. Therefore, since they all have shared functionality and construction tropes, that will be put into a base class. Further, the base class will be then returned by the factory class, [gdcmNormalizedMessageFactory.h](#).

This is an abstract class. It cannot be instantiated on its own.

### 10.29.2 Constructor & Destructor Documentation

#### 10.29.2.1 ~BaseNormalizedMessage()

```
virtual gdcm::network::BaseNormalizedMessage::~~BaseNormalizedMessage ( ) [virtual], [default]
```



## 10.29.3 Member Function Documentation

### 10.29.3.1 ConstructPDV()

```
virtual std::vector< PresentationDataValue > gdcmm::network::BaseNormalizedMessage::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [pure virtual]
```

Implemented in [gdcmm::network::NActionRQ](#), [gdcmm::network::NCreateRQ](#), [gdcmm::network::NDeleteRQ](#), [gdcmm::network::NEventReportRQ](#), [gdcmm::network::NGetRQ](#), and [gdcmm::network::NSetRQ](#).

The documentation for this class was generated from the following file:

- [gdcmmBaseNormalizedMessage.h](#)

## 10.30 gdcmm::network::BasePDU Class Reference

[BasePDU](#).

```
#include <gdcmmBasePDU.h>
```

Inheritance diagram for gdcmm::network::BasePDU:

### Public Member Functions

- virtual [~BasePDU](#) ()=default
- virtual bool [IsLastFragment](#) () const =0
- virtual void [Print](#) (std::ostream &os) const =0
- virtual std::istream & [Read](#) (std::istream &is)=0
- virtual size\_t [Size](#) () const =0
- virtual const std::ostream & [Write](#) (std::ostream &os) const =0

### 10.30.1 Detailed Description

[BasePDU](#).

base class for PDUs

all PDUs start with the first ten bytes as specified: 01 PDU type 02 reserved 3-6 PDU Length (unsigned) 7-10 variable

on some, 7-10 are split (7-8 as protocol version in Associate-RQ, for instance, while associate-rj splits those four bytes differently).

Also common to all the PDUs is their ability to read and write to a stream.

So, let's just get them all bunched together into one (abstract) class, shall we?

Why? 1) so that the [ULEvent](#) can have the PDU stored in it, since the event takes PDUs and not other class structures (other class structures get converted into PDUs) 2) to make reading PDUs in the event loop cleaner

## 10.30.2 Constructor & Destructor Documentation

### 10.30.2.1 ~BasePDU()

```
virtual gdcmm::network::BasePDU::~~BasePDU ( ) [virtual], [default]
```

## 10.30.3 Member Function Documentation

### 10.30.3.1 IsLastFragment()

```
virtual bool gdcmm::network::BasePDU::IsLastFragment ( ) const [pure virtual]
```

Implemented in [gdcmm::network::AAabortPDU](#), [gdcmm::network::AAssociateACPDU](#), [gdcmm::network::AAssociateRJPDU](#), [gdcmm::network::AAssociateRQPDU](#), [gdcmm::network::AReleaseRPPDU](#), [gdcmm::network::AReleaseRQPDU](#), and [gdcmm::network::PDataTFPDU](#).

### 10.30.3.2 Print()

```
virtual void gdcmm::network::BasePDU::Print (
    std::ostream & os ) const [pure virtual]
```

Implemented in [gdcmm::network::AAabortPDU](#), [gdcmm::network::AAssociateACPDU](#), [gdcmm::network::AAssociateRJPDU](#), [gdcmm::network::AAssociateRQPDU](#), [gdcmm::network::AReleaseRPPDU](#), [gdcmm::network::AReleaseRQPDU](#), and [gdcmm::network::PDataTFPDU](#).

### 10.30.3.3 Read()

```
virtual std::istream & gdcmm::network::BasePDU::Read (
    std::istream & is ) [pure virtual]
```

Implemented in [gdcmm::network::AAabortPDU](#), [gdcmm::network::AAssociateACPDU](#), [gdcmm::network::AAssociateRJPDU](#), [gdcmm::network::AAssociateRQPDU](#), [gdcmm::network::AReleaseRPPDU](#), [gdcmm::network::AReleaseRQPDU](#), and [gdcmm::network::PDataTFPDU](#).

#### 10.30.3.4 Size()

```
virtual size_t gdcm::network::BasePDU::Size ( ) const [pure virtual]
```

Implemented in [gdcm::network::AAabortPDU](#), [gdcm::network::AAssociateACPDU](#), [gdcm::network::AAssociateRJPDU](#), [gdcm::network::AAssociateRQPDU](#), [gdcm::network::AReleaseRPPDU](#), [gdcm::network::AReleaseRQPDU](#), and [gdcm::network::PDataTFPDU](#).

#### 10.30.3.5 Write()

```
virtual const std::ostream & gdcm::network::BasePDU::Write (
    std::ostream & os ) const [pure virtual]
```

Implemented in [gdcm::network::AAabortPDU](#), [gdcm::network::AAssociateACPDU](#), [gdcm::network::AAssociateRJPDU](#), [gdcm::network::AAssociateRQPDU](#), [gdcm::network::AReleaseRPPDU](#), [gdcm::network::AReleaseRQPDU](#), and [gdcm::network::PDataTFPDU](#).

The documentation for this class was generated from the following file:

- [gdcmBasePDU.h](#)

## 10.31 gdcm::BaseQuery Class Reference

[BaseQuery](#).

```
#include <gdcmBaseQuery.h>
```

Inheritance diagram for `gdcm::BaseQuery`:

Collaboration diagram for `gdcm::BaseQuery`:

### Public Member Functions

- [~BaseQuery](#) () override
- void [AddQueryDataSet](#) (const [DataSet](#) &ds)
- virtual [UIDs::TSName](#) [GetAbstractSyntaxUID](#) () const =0
- [DataSet](#) & [GetQueryDataSet](#) ()
- [DataSet](#) const & [GetQueryDataSet](#) () const
- *Set/Get the internal representation of the query as a [DataSet](#).*
- std::string [GetSOPInstanceUID](#) () const
- void [Print](#) (std::ostream &os) const override
- void [SetSearchParameter](#) (const std::string &inKeyword, const std::string &inValue)
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const std::string &inValue)
- void [SetSOPInstanceUID](#) (const std::string &iSopInstanceUID)
- virtual bool [ValidateQuery](#) (bool inStrict=true) const =0
- const std::ostream & [WriteHelpFile](#) (std::ostream &os)
- bool [WriteQuery](#) (const std::string &inFileName)

## Protected Member Functions

- [BaseQuery](#) ()
- void [SetSearchParameter](#) (const [Tag](#) &inTag, const [DictEntry](#) &inDictEntry, const std::string &inValue)
- bool [ValidDataSet](#) (const [DataSet](#) &dataSetToValid, const [DataSet](#) &dataSetReference) const

## Protected Attributes

- [DataSet](#) [mDataSet](#)
- std::string [mSopInstanceUID](#)

## Friends

- class [QueryFactory](#)

### 10.31.1 Detailed Description

[BaseQuery](#).

contains: a baseclass which will produce a dataset for all dimse messages

### 10.31.2 Constructor & Destructor Documentation

#### 10.31.2.1 BaseQuery()

```
gdcm::BaseQuery::BaseQuery ( ) [protected]
```

#### 10.31.2.2 ~BaseQuery()

```
gdcm::BaseQuery::~~BaseQuery ( ) [override]
```

### 10.31.3 Member Function Documentation

### 10.31.3.1 AddQueryDataSet()

```
void gdcm::BaseQuery::AddQueryDataSet (
    const DataSet & ds )
```

### 10.31.3.2 GetAbstractSyntaxUID()

```
virtual UIDs::TSName gdcm::BaseQuery::GetAbstractSyntaxUID ( ) const [pure virtual]
```

Implemented in [gdcm::FindPatientRootQuery](#), [gdcm::FindStudyRootQuery](#), [gdcm::ModalityPerformedProcedureStepCreateQuery](#), [gdcm::ModalityPerformedProcedureStepSetQuery](#), [gdcm::MovePatientRootQuery](#), [gdcm::MoveStudyRootQuery](#), and [gdcm::WLMFindQuery](#).

### 10.31.3.3 GetQueryDataSet() [1/2]

```
DataSet & gdcm::BaseQuery::GetQueryDataSet ( )
```

### 10.31.3.4 GetQueryDataSet() [2/2]

```
DataSet const & gdcm::BaseQuery::GetQueryDataSet ( ) const
```

Set/Get the internal representation of the query as a [DataSet](#).

### 10.31.3.5 GetSOPInstanceUID()

```
std::string gdcm::BaseQuery::GetSOPInstanceUID ( ) const [inline]
```

### 10.31.3.6 Print()

```
void gdcm::BaseQuery::Print (
    std::ostream & os ) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

### 10.31.3.7 SetSearchParameter() [1/3]

```
void gdcm::BaseQuery::SetSearchParameter (
    const std::string & inKeyword,
    const std::string & inValue )
```

### 10.31.3.8 SetSearchParameter() [2/3]

```
void gdcm::BaseQuery::SetSearchParameter (
    const Tag & inTag,
    const DictEntry & inDictEntry,
    const std::string & inValue ) [protected]
```

### 10.31.3.9 SetSearchParameter() [3/3]

```
void gdcm::BaseQuery::SetSearchParameter (
    const Tag & inTag,
    const std::string & inValue )
```

### 10.31.3.10 SetSOPInstanceUID()

```
void gdcm::BaseQuery::SetSOPInstanceUID (
    const std::string & iSopInstanceUID ) [inline]
```

### 10.31.3.11 ValidateQuery()

```
virtual bool gdcm::BaseQuery::ValidateQuery (
    bool inStrict = true ) const [pure virtual]
```

Implemented in [gdcm::FindPatientRootQuery](#), [gdcm::FindStudyRootQuery](#), [gdcm::ModalityPerformedProcedureStepCreateQuery](#), [gdcm::ModalityPerformedProcedureStepSetQuery](#), [gdcm::MovePatientRootQuery](#), [gdcm::MoveStudyRootQuery](#), [gdcm::WLMFindQuery](#), and [gdcm::BaseRootQuery](#).

#### 10.31.3.12 ValidDataSet()

```
bool gdcm::BaseQuery::ValidDataSet (
    const DataSet & dataSetToValid,
    const DataSet & dataSetReference ) const [protected]
```

#### 10.31.3.13 WriteHelpFile()

```
const std::ostream & gdcm::BaseQuery::WriteHelpFile (
    std::ostream & os )
```

#### 10.31.3.14 WriteQuery()

```
bool gdcm::BaseQuery::WriteQuery (
    const std::string & inFileName )
```

### 10.31.4 Friends And Related Function Documentation

#### 10.31.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

### 10.31.5 Member Data Documentation

#### 10.31.5.1 mDataSet

```
DataSet gdcm::BaseQuery::mDataSet [protected]
```

### 10.31.5.2 mSopInstanceUID

```
std::string gdcm::BaseQuery::mSopInstanceUID [protected]
```

The documentation for this class was generated from the following file:

- [gdcmBaseQuery.h](#)

## 10.32 gdcm::BaseRootQuery Class Reference

[BaseRootQuery](#).

```
#include <gdcmBaseRootQuery.h>
```

Inheritance diagram for gdcm::BaseRootQuery:

Collaboration diagram for gdcm::BaseRootQuery:

### Public Member Functions

- [~BaseRootQuery](#) () override
- [EQueryLevel GetQueryLevelFromQueryRoot](#) (ERootType roottype)
- virtual std::vector< [Tag](#) > [GetTagListByLevel](#) (const [EQueryLevel](#) &inQueryLevel)=0
- virtual void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel)=0
- bool [ValidateQuery](#) (bool inStrict=true) const override=0

### Static Public Member Functions

- static [QueryBase](#) \* [Construct](#) (ERootType inRootType, [EQueryLevel](#) qllevel)
- static int [GetQueryLevelFromString](#) (const char \*str)
- static const char \* [GetQueryLevelString](#) ([EQueryLevel](#) ql)

### Protected Member Functions

- [BaseRootQuery](#) ()

### Protected Attributes

- std::string [mHelpDescription](#)
- [QueryImage](#) mImage
- [QueryPatient](#) mPatient
- [ERootType](#) mRootType
- [QuerySeries](#) mSeries
- [QueryStudy](#) mStudy



## Friends

- class [QueryFactory](#)

### 10.32.1 Detailed Description

[BaseRootQuery](#).

contains: a baseclass which will produce a dataset for c-find and c-move with patient/study root

This class contains the functionality used in patient c-find and c-move queries. PatientRootQuery and StudyRootQuery derive from this class.

Namely: 1) list all tags associated with a particular query type 2) produce a query dataset via tag association

Eventually, it can be used to validate a particular dataset type.

The dataset held by this object (or, really, one of its derivatives) should be passed to a c-find or c-move query.

### 10.32.2 Constructor & Destructor Documentation

#### 10.32.2.1 BaseRootQuery()

```
gdcm::BaseRootQuery::BaseRootQuery ( ) [protected]
```

#### 10.32.2.2 ~BaseRootQuery()

```
gdcm::BaseRootQuery::~~BaseRootQuery ( ) [override]
```

### 10.32.3 Member Function Documentation

#### 10.32.3.1 Construct()

```
static QueryBase * gdcm::BaseRootQuery::Construct (
    ERootType inRootType,
    EQueryLevel qllevel ) [static]
```

### 10.32.3.2 GetQueryLevelFromQueryRoot()

```
EQueryLevel gdcM::BaseRootQuery::GetQueryLevelFromQueryRoot (
    ERootType roottype )
```

### 10.32.3.3 GetQueryLevelFromString()

```
static int gdcM::BaseRootQuery::GetQueryLevelFromString (
    const char * str ) [static]
```

### 10.32.3.4 GetQueryLevelString()

```
static const char * gdcM::BaseRootQuery::GetQueryLevelString (
    EQueryLevel ql ) [static]
```

### 10.32.3.5 GetTagListByLevel()

```
virtual std::vector< Tag > gdcM::BaseRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel ) [pure virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implemented in [gdcM::FindPatientRootQuery](#), [gdcM::FindStudyRootQuery](#), [gdcM::MovePatientRootQuery](#), [gdcM::MoveStudyRootQuery](#), and [gdcM::WLMFindQuery](#).

### 10.32.3.6 InitializeDataSet()

```
virtual void gdcM::BaseRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel ) [pure virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implemented in [gdcM::FindPatientRootQuery](#), [gdcM::FindStudyRootQuery](#), [gdcM::MovePatientRootQuery](#), [gdcM::MoveStudyRootQuery](#), and [gdcM::WLMFindQuery](#).

### 10.32.3.7 ValidateQuery()

```
bool gdcm::BaseRootQuery::ValidateQuery (
    bool inStrict = true ) const  [override], [pure virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseQuery](#).

Implemented in [gdcm::FindPatientRootQuery](#), [gdcm::FindStudyRootQuery](#), [gdcm::MovePatientRootQuery](#), [gdcm::MoveStudyRootQuery](#), and [gdcm::WLMFindQuery](#).

## 10.32.4 Friends And Related Function Documentation

### 10.32.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

## 10.32.5 Member Data Documentation

### 10.32.5.1 mHelpDescription

```
std::string gdcm::BaseRootQuery::mHelpDescription  [protected]
```

### 10.32.5.2 mImage

```
QueryImage gdcm::BaseRootQuery::mImage  [protected]
```

### 10.32.5.3 mPatient

`QueryPatient` `gdcm::BaseRootQuery::mPatient` [protected]

### 10.32.5.4 mRootType

`ERootType` `gdcm::BaseRootQuery::mRootType` [protected]

### 10.32.5.5 mSeries

`QuerySeries` `gdcm::BaseRootQuery::mSeries` [protected]

### 10.32.5.6 mStudy

`QueryStudy` `gdcm::BaseRootQuery::mStudy` [protected]

The documentation for this class was generated from the following file:

- [gdcmBaseRootQuery.h](#)

## 10.33 gdcm::SegmentHelper::BasicCodedEntry Struct Reference

This structure defines a basic coded entry with all of its attributes.

```
#include <gdcmSegmentHelper.h>
```

Collaboration diagram for `gdcm::SegmentHelper::BasicCodedEntry`:

### Public Member Functions

- [BasicCodedEntry](#) ()  
*Constructor.*
- [BasicCodedEntry](#) (const char \*\_a\_CV, const char \*\_a\_CSD, const char \*\_a\_CM)  
*constructor which defines type 1 attributes.*
- [BasicCodedEntry](#) (const char \*\_a\_CV, const char \*\_a\_CSD, const char \*\_a\_CSV, const char \*\_a\_CM)  
*constructor which defines attributes.*
- bool [IsEmpty](#) (const bool checkOptionalAttributes=false) const  
*Check if each attributes of the basic coded entry is defined.*

## Public Attributes

- std::string [CM](#)  
*Coding Scheme [Version](#) attribute.*
- std::string [CSD](#)  
*Code [Value](#) attribute.*
- std::string [CSV](#)  
*Coding Scheme Designator attribute.*
- std::string [CV](#)

### 10.33.1 Detailed Description

This structure defines a basic coded entry with all of its attributes.

See also

PS 3.3 section 8.8.

### 10.33.2 Constructor & Destructor Documentation

#### 10.33.2.1 BasicCodedEntry() [1/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry ( ) [inline]
```

Constructor.

#### 10.33.2.2 BasicCodedEntry() [2/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry (
    const char * a_CV,
    const char * a_CSD,
    const char * a_CM ) [inline]
```

constructor which defines type 1 attributes.

### 10.33.2.3 BasicCodedEntry() [3/3]

```
gdcm::SegmentHelper::BasicCodedEntry::BasicCodedEntry (
    const char * a_CV,
    const char * a_CSD,
    const char * a_CSV,
    const char * a_CM ) [inline]
```

constructor which defines attributes.

## 10.33.3 Member Function Documentation

### 10.33.3.1 IsEmpty()

```
bool gdcm::SegmentHelper::BasicCodedEntry::IsEmpty (
    const bool checkOptionalAttributes = false ) const
```

Check if each attributes of the basic coded entry is defined.

Parameters

<i>checkOptionalAttributes</i>	Check also type 1C attributes.
--------------------------------	--------------------------------

## 10.33.4 Member Data Documentation

### 10.33.4.1 CM

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CM
```

Coding Scheme [Version](#) attribute.

### 10.33.4.2 CSD

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CSD
```

Code [Value](#) attribute.

### 10.33.4.3 CSV

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CSV
```

Coding Scheme Designator attribute.

### 10.33.4.4 CV

```
std::string gdcm::SegmentHelper::BasicCodedEntry::CV
```

The documentation for this struct was generated from the following file:

- [gdcmSegmentHelper.h](#)

## 10.34 gdcm::BasicOffsetTable Class Reference

Class to represent a [BasicOffsetTable](#).

```
#include <gdcmBasicOffsetTable.h>
```

Inheritance diagram for gdcm::BasicOffsetTable:

Collaboration diagram for gdcm::BasicOffsetTable:

### Public Member Functions

- [BasicOffsetTable](#) ()
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [BasicOffsetTable](#) &val)

### Additional Inherited Members

#### 10.34.1 Detailed Description

Class to represent a [BasicOffsetTable](#).

## 10.34.2 Constructor & Destructor Documentation

### 10.34.2.1 BasicOffsetTable()

```
gdcm::BasicOffsetTable::BasicOffsetTable ( ) [inline]
```

## 10.34.3 Member Function Documentation

### 10.34.3.1 Read()

```
template<typename TSwap >  
std::istream & gdcm::BasicOffsetTable::Read (   
    std::istream & is ) [inline]
```

References [gdcmAssertAlwaysMacro](#), and [gdcm::ParseException::SetLastElement\(\)](#).

## 10.34.4 Friends And Related Function Documentation

### 10.34.4.1 operator<<

```
std::ostream & operator<< (   
    std::ostream & os,   
    const BasicOffsetTable & val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmBasicOffsetTable.h](#)

## 10.35 gdcm::Bitmap Class Reference

[Bitmap](#) class.

```
#include <gdcmBitmap.h>
```

Inheritance diagram for gdcm::Bitmap:

Collaboration diagram for gdcm::Bitmap:



## Public Member Functions

- [Bitmap](#) ()
- [~Bitmap](#) () override
- virtual bool [AreOverlaysInPixelData](#) () const
- void [Clear](#) ()
- bool [GetBuffer](#) (char \*buffer) const  
*Access the raw data.*
- unsigned long [GetBufferLength](#) () const
- unsigned int [GetColumns](#) () const
- [DataElement](#) & [GetDataElement](#) ()
- const [DataElement](#) & [GetDataElement](#) () const
- unsigned int [GetDimension](#) (unsigned int idx) const
- const unsigned int \* [GetDimensions](#) () const  
*Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...*
- [LookupTable](#) & [GetLUT](#) ()
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const  
*INTERNAL do not use.*
- unsigned int [GetNumberOfDimensions](#) () const  
*Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.*
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const  
*return the photometric interpretation*
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const  
*Get/Set PixelFormat.*
- unsigned int [GetPlanarConfiguration](#) () const  
*return the planar configuration*
- unsigned int [GetRows](#) () const
- const [TransferSyntax](#) & [GetTransferSyntax](#) () const
- bool [IsEmpty](#) () const
- bool [IsLossy](#) () const  
*Return whether or not the image was compressed using a lossy compressor or not.*
- bool [IsTransferSyntaxCompatible](#) ([TransferSyntax](#) const &ts) const
- void [Print](#) (std::ostream &) const override
- void [SetColumns](#) (unsigned int col)
- void [SetDataElement](#) ([DataElement](#) const &de)
- void [SetDimension](#) (unsigned int idx, unsigned int dim)
- void [SetDimensions](#) (const unsigned int dims[3])
- void [SetLossyFlag](#) (bool f)  
*Specifically set that the image was compressed using a lossy compression mechanism.*
- void [SetLUT](#) ([LookupTable](#) const &lut)  
*Set/Get LUT.*
- void [SetNeedByteSwap](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)
- void [SetRows](#) (unsigned int rows)
- void [SetTransferSyntax](#) ([TransferSyntax](#) const &ts)  
*Transfer syntax.*
- virtual bool [UnusedBitsPresentInPixelData](#) () const

## Protected Types

- typedef [SmartPointer](#) < [LookupTable](#) > [LUTPtr](#)

## Protected Member Functions

- bool [ComputeLossyFlag](#) ()
- bool [GetBuffer2](#) (std::ostream &os) const
- bool [TryJPEG2000Codec](#) (char \*buffer, bool &lossyflag) const
- bool [TryJPEG2000Codec2](#) (std::ostream &os) const
- bool [TryJPEGCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryJPEGCodec2](#) (std::ostream &os) const
- bool [TryJPEGLSCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryKAKADUCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryPVRGCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryRAWCodec](#) (char \*buffer, bool &lossyflag) const
- bool [TryRLECodec](#) (char \*buffer, bool &lossyflag) const

## Protected Attributes

- std::vector< unsigned int > [Dimensions](#)
- bool [LossyFlag](#)
- [LUTPtr](#) [LUT](#)
- bool [NeedByteSwap](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) [PF](#)
- [PhotometricInterpretation](#) [PI](#)
- [DataElement](#) [PixelData](#)
- unsigned int [PlanarConfiguration](#)
- [TransferSyntax](#) [TS](#)

## Friends

- class [ImageChangeTransferSyntax](#)
- class [PixmapReader](#)

### 10.35.1 Detailed Description

[Bitmap](#) class.

A bitmap based image. Used as parent for both IconImage and the main Pixel Data [Image](#) It does not contains any World Space information (IPP, IOP)

#### Examples

[ExtractIconFromFile.cxx](#).

## 10.35.2 Member Typedef Documentation

### 10.35.2.1 LUTPtr

```
typedef SmartPointer<LookupTable> gdcm::Bitmap::LUTPtr [protected]
```

## 10.35.3 Constructor & Destructor Documentation

### 10.35.3.1 Bitmap()

```
gdcm::Bitmap::Bitmap ( )
```

### 10.35.3.2 ~Bitmap()

```
gdcm::Bitmap::~~Bitmap ( ) [override]
```

## 10.35.4 Member Function Documentation

### 10.35.4.1 AreOverlaysInPixelData()

```
virtual bool gdcm::Bitmap::AreOverlaysInPixelData ( ) const [inline], [virtual]
```

Reimplemented in [gdcm::Pixmap](#).

### 10.35.4.2 Clear()

```
void gdcm::Bitmap::Clear ( )
```

#### 10.35.4.3 ComputeLossyFlag()

```
bool gdcm::Bitmap::ComputeLossyFlag ( ) [protected]
```

#### 10.35.4.4 GetBuffer()

```
bool gdcm::Bitmap::GetBuffer (
    char * buffer ) const
```

Access the raw data.

##### Examples

[BasicImageAnonymizer.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [GetArray.cs](#), [ReadMultiTimesException.cxx](#), and [threadgdcm.cxx](#).

#### 10.35.4.5 GetBuffer2()

```
bool gdcm::Bitmap::GetBuffer2 (
    std::ostream & os ) const [protected]
```

#### 10.35.4.6 GetBufferLength()

```
unsigned long gdcm::Bitmap::GetBufferLength ( ) const
```

Return the length of the image after decompression WARNING for palette color: It will NOT take into account the Palette Color thus you need to multiply this length by 3 if computing the size of equivalent RGB image

##### Examples

[BasicImageAnonymizer.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [GenFakeImage.cxx](#), [GetArray.cs](#), [GetSubSequenceData.cxx](#), [PatchFile.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), and [threadgdcm.cxx](#).

#### 10.35.4.7 GetColumns()

```
unsigned int gdcm::Bitmap::GetColumns ( ) const [inline]
```

#### 10.35.4.8 GetDataElement() [1/2]

```
DataElement & gdcm::Bitmap::GetDataElement ( ) [inline]
```

#### 10.35.4.9 GetDataElement() [2/2]

```
const DataElement & gdcm::Bitmap::GetDataElement ( ) const [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.35.4.10 GetDimension()

```
unsigned int gdcm::Bitmap::GetDimension (
    unsigned int idx ) const
```

##### Examples

[BasicImageAnonymizer.cs](#), [DecompressImage.cs](#), and [GetArray.cs](#).

#### 10.35.4.11 GetDimensions()

```
const unsigned int * gdcm::Bitmap::GetDimensions ( ) const
```

Return the dimension of the pixel data, first dimension (x), then 2nd (y), then 3rd (z)...

##### Examples

[ConvertToQImage.cxx](#), [ExtractIconFromFile.cxx](#), [FixJAIBugJPEGLS.cxx](#), [HelloVizWorld.cxx](#), and [threadgdcm.cxx](#).

#### 10.35.4.12 GetLUT() [1/2]

```
LookupTable & gdcm::Bitmap::GetLUT ( ) [inline]
```

#### 10.35.4.13 GetLUT() [2/2]

```
const LookupTable & gdcM::Bitmap::GetLUT ( ) const [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#), [ExtractImageRegionWithLUT.cs](#), and [PrintLUT.cxx](#).

#### 10.35.4.14 GetNeedByteSwap()

```
bool gdcM::Bitmap::GetNeedByteSwap ( ) const [inline]
```

INTERNAL do not use.

#### 10.35.4.15 GetNumberOfDimensions()

```
unsigned int gdcM::Bitmap::GetNumberOfDimensions ( ) const
```

Return the number of dimension of the pixel data bytes; for example 2 for a 2D matrices of values.

##### Examples

[DecompressImage.cs](#), [GetArray.cs](#), [HelloVizWorld.cxx](#), and [threadgdcM.cxx](#).

#### 10.35.4.16 GetPhotometricInterpretation()

```
const PhotometricInterpretation & gdcM::Bitmap::GetPhotometricInterpretation ( ) const
```

return the photometric interpretation

##### Examples

[ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), and [HelloVizWorld.cxx](#).

#### 10.35.4.17 GetPixelFormat() [1/2]

```
PixelFormat & gdcm::Bitmap::GetPixelFormat ( ) [inline]
```

#### 10.35.4.18 GetPixelFormat() [2/2]

```
const PixelFormat & gdcm::Bitmap::GetPixelFormat ( ) const [inline]
```

Get/Set [PixelFormat](#).

##### Examples

[ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeImage.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), and [threadgdcm.cxx](#).

#### 10.35.4.19 GetPlanarConfiguration()

```
unsigned int gdcm::Bitmap::GetPlanarConfiguration ( ) const
```

return the planar configuration

#### 10.35.4.20 GetRows()

```
unsigned int gdcm::Bitmap::GetRows ( ) const [inline]
```

#### 10.35.4.21 GetTransferSyntax()

```
const TransferSyntax & gdcm::Bitmap::GetTransferSyntax ( ) const [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.35.4.22 IsEmpty()

```
bool gdcm::Bitmap::IsEmpty ( ) const [inline]
```

#### 10.35.4.23 IsLossy()

```
bool gdcm::Bitmap::IsLossy ( ) const
```

Return whether or not the image was compressed using a lossy compressor or not.

#### 10.35.4.24 IsTransferSyntaxCompatible()

```
bool gdcm::Bitmap::IsTransferSyntaxCompatible (
    TransferSyntax const & ts ) const
```

#### 10.35.4.25 Print()

```
void gdcm::Bitmap::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

Reimplemented in [gdcm::Pixmap](#), and [gdcm::Image](#).

#### Examples

[ExtractIconFromFile.cxx](#).

#### 10.35.4.26 SetColumns()

```
void gdcm::Bitmap::SetColumns (
    unsigned int col ) [inline]
```



#### 10.35.4.27 SetDataElement()

```
void gdcm::Bitmap::SetDataElement (
    DataElement const & de ) [inline]
```

##### Examples

[BasicImageAnonymizer.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.c](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

#### 10.35.4.28 SetDimension()

```
void gdcm::Bitmap::SetDimension (
    unsigned int idx,
    unsigned int dim )
```

##### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

#### 10.35.4.29 SetDimensions()

```
void gdcm::Bitmap::SetDimensions (
    const unsigned int dims[3] )
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), and [DecompressImage.cs](#).

#### 10.35.4.30 SetLossyFlag()

```
void gdcm::Bitmap::SetLossyFlag (
    bool f ) [inline]
```

Specifically set that the image was compressed using a lossy compression mechanism.

#### 10.35.4.31 SetLUT()

```
void gdcM::Bitmap::SetLUT (
    LookupTable const & lut ) [inline]
```

Set/Get LUT.

#### 10.35.4.32 SetNeedByteSwap()

```
void gdcM::Bitmap::SetNeedByteSwap (
    bool b ) [inline]
```

#### 10.35.4.33 SetNumberOfDimensions()

```
void gdcM::Bitmap::SetNumberOfDimensions (
    unsigned int dim )
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

#### 10.35.4.34 SetPhotometricInterpretation()

```
void gdcM::Bitmap::SetPhotometricInterpretation (
    PhotometricInterpretation const & pi )
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

#### 10.35.4.35 SetPixelFormat()

```
void gdcm::Bitmap::SetPixelFormat (
    PixelFormat const & pf ) [inline]
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

References [gdcm::PixelFormat::Validate\(\)](#).

#### 10.35.4.36 SetPlanarConfiguration()

```
void gdcm::Bitmap::SetPlanarConfiguration (
    unsigned int pc )
```

##### Warning

you need to call SetPixelFormat first (before SetPlanarConfiguration) for consistency checking

#### 10.35.4.37 SetRows()

```
void gdcm::Bitmap::SetRows (
    unsigned int rows ) [inline]
```

#### 10.35.4.38 SetTransferSyntax()

```
void gdcm::Bitmap::SetTransferSyntax (
    TransferSyntax const & ts ) [inline]
```

Transfer syntax.

##### Examples

[BasicImageAnonymizer.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [MergeTwoFiles.cxx](#), and [MpegVideoInfo.cs](#).

**10.35.4.39 TryJPEG2000Codec()**

```
bool gdcm::Bitmap::TryJPEG2000Codec (
    char * buffer,
    bool & lossyflag ) const [protected]
```

**10.35.4.40 TryJPEG2000Codec2()**

```
bool gdcm::Bitmap::TryJPEG2000Codec2 (
    std::ostream & os ) const [protected]
```

**10.35.4.41 TryJPEGCodec()**

```
bool gdcm::Bitmap::TryJPEGCodec (
    char * buffer,
    bool & lossyflag ) const [protected]
```

**10.35.4.42 TryJPEGCodec2()**

```
bool gdcm::Bitmap::TryJPEGCodec2 (
    std::ostream & os ) const [protected]
```

**10.35.4.43 TryJPEGLSCodec()**

```
bool gdcm::Bitmap::TryJPEGLSCodec (
    char * buffer,
    bool & lossyflag ) const [protected]
```

**10.35.4.44 TryKAKADUCodec()**

```
bool gdcm::Bitmap::TryKAKADUCodec (
    char * buffer,
    bool & lossyflag ) const [protected]
```

#### 10.35.4.45 TryPVRGCodec()

```
bool gdcm::Bitmap::TryPVRGCodec (
    char * buffer,
    bool & lossyflag ) const    [protected]
```

#### 10.35.4.46 TryRAWCodec()

```
bool gdcm::Bitmap::TryRAWCodec (
    char * buffer,
    bool & lossyflag ) const    [protected]
```

#### 10.35.4.47 TryRLECodec()

```
bool gdcm::Bitmap::TryRLECodec (
    char * buffer,
    bool & lossyflag ) const    [protected]
```

#### 10.35.4.48 UnusedBitsPresentInPixelData()

```
virtual bool gdcm::Bitmap::UnusedBitsPresentInPixelData ( ) const    [inline], [virtual]
```

Reimplemented in [gdcm::Pixmap](#).

### 10.35.5 Friends And Related Function Documentation

#### 10.35.5.1 ImageChangeTransferSyntax

```
friend class ImageChangeTransferSyntax    [friend]
```

#### 10.35.5.2 PixmapReader

```
friend class PixmapReader    [friend]
```

## 10.35.6 Member Data Documentation

### 10.35.6.1 Dimensions

```
std::vector<unsigned int> gdcm::Bitmap::Dimensions [protected]
```

### 10.35.6.2 LossyFlag

```
bool gdcm::Bitmap::LossyFlag [protected]
```

### 10.35.6.3 LUT

```
LUTPtr gdcm::Bitmap::LUT [protected]
```

### 10.35.6.4 NeedByteSwap

```
bool gdcm::Bitmap::NeedByteSwap [protected]
```

### 10.35.6.5 NumberOfDimensions

```
unsigned int gdcm::Bitmap::NumberOfDimensions [protected]
```

### 10.35.6.6 PF

```
PixelFormat gdcm::Bitmap::PF [protected]
```

### 10.35.6.7 PI

[PhotometricInterpretation](#) gdcm::Bitmap::PI [protected]

### 10.35.6.8 PixelData

[DataElement](#) gdcm::Bitmap::PixelData [protected]

### 10.35.6.9 PlanarConfiguration

unsigned int gdcm::Bitmap::PlanarConfiguration [protected]

### 10.35.6.10 TS

[TransferSyntax](#) gdcm::Bitmap::TS [protected]

The documentation for this class was generated from the following file:

- [gdcmBitmap.h](#)

## 10.36 gdcm::BitmapToBitmapFilter Class Reference

[BitmapToBitmapFilter](#) class.

```
#include <gdcmBitmapToBitmapFilter.h>
```

Inheritance diagram for gdcm::BitmapToBitmapFilter:

Collaboration diagram for gdcm::BitmapToBitmapFilter:

### Public Member Functions

- [BitmapToBitmapFilter](#) ()
- [~BitmapToBitmapFilter](#) ()=default
- const [Bitmap](#) & [GetOutput](#) () const  
*Get Output image.*
- const [Bitmap](#) & [GetOutputAsBitmap](#) () const
- void [SetInput](#) (const [Bitmap](#) &image)  
*Set input image.*

## Protected Attributes

- [SmartPointer< Bitmap > Input](#)
- [SmartPointer< Bitmap > Output](#)

### 10.36.1 Detailed Description

[BitmapToBitmapFilter](#) class.

Super class for all filter taking an image and producing an output image

### 10.36.2 Constructor & Destructor Documentation

#### 10.36.2.1 [BitmapToBitmapFilter\(\)](#)

```
gdcm::BitmapToBitmapFilter::BitmapToBitmapFilter ( )
```

#### 10.36.2.2 [~BitmapToBitmapFilter\(\)](#)

```
gdcm::BitmapToBitmapFilter::~~BitmapToBitmapFilter ( ) [default]
```

### 10.36.3 Member Function Documentation

#### 10.36.3.1 [GetOutput\(\)](#)

```
const Bitmap & gdcm::BitmapToBitmapFilter::GetOutput ( ) const [inline]
```

Get Output image.

#### 10.36.3.2 [GetOutputAsBitmap\(\)](#)

```
const Bitmap & gdcm::BitmapToBitmapFilter::GetOutputAsBitmap ( ) const
```



### 10.36.3.3 SetInput()

```
void gdcm::BitmapToBitmapFilter::SetInput (
    const Bitmap & image )
```

Set input image.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

## 10.36.4 Member Data Documentation

### 10.36.4.1 Input

```
SmartPointer<Bitmap> gdcm::BitmapToBitmapFilter::Input [protected]
```

### 10.36.4.2 Output

```
SmartPointer<Bitmap> gdcm::BitmapToBitmapFilter::Output [protected]
```

The documentation for this class was generated from the following file:

- [gdcmBitmapToBitmapFilter.h](#)

## 10.37 gdcm::BoxRegion Class Reference

Class for manipulation box region.

```
#include <gdcmBoxRegion.h>
```

Inheritance diagram for gdcm::BoxRegion:

Collaboration diagram for gdcm::BoxRegion:

## Public Member Functions

- [BoxRegion](#) ()
- [BoxRegion](#) (const [BoxRegion](#) &)  
*copy/cstor and al.*
- [~BoxRegion](#) () override
- [size\\_t Area](#) () const override  
*compute the area*
- [Region \\* Clone](#) () const override
- [BoxRegion ComputeBoundingBox](#) () override  
*Return the Axis-Aligned minimum bounding box for all regions.*
- [bool Empty](#) () const override  
*return whether this domain is empty:*
- [unsigned int GetXMax](#) () const
- [unsigned int GetXMin](#) () const  
*Get domain.*
- [unsigned int GetYMax](#) () const
- [unsigned int GetYMin](#) () const
- [unsigned int GetZMax](#) () const
- [unsigned int GetZMin](#) () const
- [bool IsValid](#) () const override  
*return whether this is valid domain*
- [void operator=](#) (const [BoxRegion](#) &)
- [void Print](#) (std::ostream &os=std::cout) const override  
*Print.*
- [void SetDomain](#) (unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax)  
*Set domain.*

## Static Public Member Functions

- static [BoxRegion BoundingBox](#) ([BoxRegion](#) const &b1, [BoxRegion](#) const &b2)  
*Helper class to compute the bounding box of two [BoxRegion](#).*

### 10.37.1 Detailed Description

Class for manipulation box region.

This is a very simple implementation of the [Region](#) class. It only support 3D box type region. It assumes the 3D Box does not have a tilt Origin is as (0,0,0)

#### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

## 10.37.2 Constructor & Destructor Documentation

### 10.37.2.1 BoxRegion() [1/2]

```
gdcm::BoxRegion::BoxRegion ( )
```

### 10.37.2.2 ~BoxRegion()

```
gdcm::BoxRegion::~~BoxRegion ( ) [override]
```

### 10.37.2.3 BoxRegion() [2/2]

```
gdcm::BoxRegion::BoxRegion (
    const BoxRegion & )
```

copy/cstor and al.

## 10.37.3 Member Function Documentation

### 10.37.3.1 Area()

```
size_t gdcm::BoxRegion::Area ( ) const [override], [virtual]
```

compute the area

Implements [gdcm::Region](#).

### 10.37.3.2 BoundingBox()

```
static BoxRegion gdcm::BoxRegion::BoundingBox (
    BoxRegion const & b1,
    BoxRegion const & b2 ) [static]
```

Helper class to compute the bounding box of two [BoxRegion](#).

### 10.37.3.3 Clone()

```
Region * gdcM::BoxRegion::Clone ( ) const [override], [virtual]
```

Implements [gdcM::Region](#).

### 10.37.3.4 ComputeBoundingBox()

```
BoxRegion gdcM::BoxRegion::ComputeBoundingBox ( ) [override], [virtual]
```

Return the Axis-Aligned minimum bounding box for all regions.

Implements [gdcM::Region](#).

### 10.37.3.5 Empty()

```
bool gdcM::BoxRegion::Empty ( ) const [override], [virtual]
```

return whether this domain is empty:

Implements [gdcM::Region](#).

### 10.37.3.6 GetXMax()

```
unsigned int gdcM::BoxRegion::GetXMax ( ) const
```

### 10.37.3.7 GetXMin()

```
unsigned int gdcM::BoxRegion::GetXMin ( ) const
```

Get domain.

### 10.37.3.8 GetYMax()

```
unsigned int gdcM::BoxRegion::GetYMax ( ) const
```

### 10.37.3.9 GetYMin()

```
unsigned int gdcm::BoxRegion::GetYMin ( ) const
```

### 10.37.3.10 GetZMax()

```
unsigned int gdcm::BoxRegion::GetZMax ( ) const
```

### 10.37.3.11 GetZMin()

```
unsigned int gdcm::BoxRegion::GetZMin ( ) const
```

### 10.37.3.12 IsValid()

```
bool gdcm::BoxRegion::IsValid ( ) const [override], [virtual]
```

return whether this is valid domain

Implements [gdcm::Region](#).

### 10.37.3.13 operator=()

```
void gdcm::BoxRegion::operator= (
    const BoxRegion & )
```

### 10.37.3.14 Print()

```
void gdcm::BoxRegion::Print (
    std::ostream & os = std::cout ) const [override], [virtual]
```

Print.

Reimplemented from [gdcm::Region](#).

### 10.37.3.15 SetDomain()

```
void gdcM::BoxRegion::SetDomain (
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax )
```

Set domain.

#### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

The documentation for this class was generated from the following file:

- [gdcMBoxRegion.h](#)

## 10.38 gdcM::ByteBuffer Class Reference

[ByteBuffer](#).

```
#include <gdcMByteBuffer.h>
```

### Public Member Functions

- [ByteBuffer](#) ()
- char \* [Get](#) (int len)
- const char \* [GetStart](#) () const
- void [ShiftEnd](#) (int len)
- void [UpdatePosition](#) ()

### 10.38.1 Detailed Description

[ByteBuffer](#).

Detailed description here

#### Note

looks like a `std::streambuf` or `std::filebuf` class with the get and peek pointer

## 10.38.2 Constructor & Destructor Documentation

### 10.38.2.1 ByteBuffer()

```
gdcm::ByteBuffer::ByteBuffer ( ) [inline]
```

## 10.38.3 Member Function Documentation

### 10.38.3.1 Get()

```
char * gdcm::ByteBuffer::Get (
    int len ) [inline]
```

### 10.38.3.2 GetStart()

```
const char * gdcm::ByteBuffer::GetStart ( ) const [inline]
```

### 10.38.3.3 ShiftEnd()

```
void gdcm::ByteBuffer::ShiftEnd (
    int len ) [inline]
```

### 10.38.3.4 UpdatePosition()

```
void gdcm::ByteBuffer::UpdatePosition ( ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmByteBuffer.h](#)

## 10.39 gdcm::ByteSwap< T > Class Template Reference

[ByteSwap](#).

```
#include <gdcmByteSwap.h>
```

### Static Public Member Functions

- static void [Swap](#) (T &p)
- static void [SwapFromSwapCodeIntoSystem](#) (T &p, [SwapCode](#) const &sc)
- static void [SwapRange](#) (T \*p, unsigned int num)
- static void [SwapRangeFromSwapCodeIntoSystem](#) (T \*p, [SwapCode](#) const &sc, std::streamoff num)
- static bool [SystemIsBigEndian](#) ()
- static bool [SystemIsLittleEndian](#) ()

### 10.39.1 Detailed Description

```
template<class T>  
class gdcm::ByteSwap< T >
```

[ByteSwap](#).

Perform machine dependent byte swapping (Little Endian, Big Endian, Bad Little Endian, Bad Big Endian). TODO: bswap\_32 / bswap\_64 ...

#### Examples

[TestByteSwap.cxx](#).

### 10.39.2 Member Function Documentation

#### 10.39.2.1 Swap()

```
template<class T >  
static void gdcm::ByteSwap< T >::Swap (  
    T & p ) [static]
```



### 10.39.2.2 SwapFromSwapCodeIntoSystem()

```
template<class T >
static void gdcm::ByteSwap< T >::SwapFromSwapCodeIntoSystem (
    T & p,
    SwapCode const & sc ) [static]
```

#### Examples

[TestByteSwap.cxx](#).

### 10.39.2.3 SwapRange()

```
template<class T >
static void gdcm::ByteSwap< T >::SwapRange (
    T * p,
    unsigned int num ) [static]
```

### 10.39.2.4 SwapRangeFromSwapCodeIntoSystem()

```
template<class T >
static void gdcm::ByteSwap< T >::SwapRangeFromSwapCodeIntoSystem (
    T * p,
    SwapCode const & sc,
    std::streamoff num ) [static]
```

#### Examples

[TestByteSwap.cxx](#).

### 10.39.2.5 SystemIsBigEndian()

```
template<class T >
static bool gdcm::ByteSwap< T >::SystemIsBigEndian ( ) [static]
```

Query the machine Endian-ness.

### 10.39.2.6 SystemIsLittleEndian()

```
template<class T >
static bool gdcm::ByteSwap< T >::SystemIsLittleEndian ( ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmByteSwap.h](#)

## 10.40 [gdcm::ByteSwapFilter](#) Class Reference

[ByteSwapFilter](#).

```
#include <gdcmByteSwapFilter.h>
```

### Public Member Functions

- [ByteSwapFilter](#) (const [ByteSwapFilter](#) &)=delete
- [ByteSwapFilter](#) ([DataSet](#) &ds)
- [~ByteSwapFilter](#) ()
- bool [ByteSwap](#) ()
- [ByteSwapFilter](#) & [operator=](#) (const [ByteSwapFilter](#) &)=delete
- void [SetByteSwapTag](#) (bool b)

### 10.40.1 Detailed Description

[ByteSwapFilter](#).

In place byte-swapping of a dataset FIXME: FL status ??

### 10.40.2 Constructor & Destructor Documentation

#### 10.40.2.1 [ByteSwapFilter](#)() [1/2]

```
gdcm::ByteSwapFilter::ByteSwapFilter (
    DataSet & ds ) [inline]
```

### 10.40.2.2 ~ByteSwapFilter()

```
gdcm::ByteSwapFilter::~~ByteSwapFilter ( )
```

### 10.40.2.3 ByteSwapFilter() [2/2]

```
gdcm::ByteSwapFilter::ByteSwapFilter (
    const ByteSwapFilter & ) [delete]
```

## 10.40.3 Member Function Documentation

### 10.40.3.1 ByteSwap()

```
bool gdcm::ByteSwapFilter::ByteSwap ( )
```

Referenced by [gdcm::Item::Read\(\)](#).

### 10.40.3.2 operator=()

```
ByteSwapFilter & gdcm::ByteSwapFilter::operator= (
    const ByteSwapFilter & ) [delete]
```

### 10.40.3.3 SetByteSwapTag()

```
void gdcm::ByteSwapFilter::SetByteSwapTag (
    bool b ) [inline]
```

Referenced by [gdcm::Item::Read\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmByteSwapFilter.h](#)

## 10.41 gdcm::ByteValue Class Reference

Class to represent binary value (array of bytes)

```
#include <gdcmByteValue.h>
```

Inheritance diagram for gdcm::ByteValue:

Collaboration diagram for gdcm::ByteValue:

### Public Member Functions

- [ByteValue](#) (const char \*array=nullptr, [VL](#) const &vl=0)
- [ByteValue](#) (std::vector< char > &v)
- [~ByteValue](#) () override
- void [Append](#) ([ByteValue](#) const &bv)
- void [Clear](#) () override
- [VL ComputeLength](#) () const
- void [Fill](#) (char c)
- bool [GetBuffer](#) (char \*buffer, unsigned long length) const
- [VL GetLength](#) () const override
- const char \* [GetPointer](#) () const
- void \* [GetVoidPointer](#) ()
- const void \* [GetVoidPointer](#) () const
- bool [IsEmpty](#) () const
- bool [IsPrintable](#) ([VL](#) length) const
 

*Checks whether a 'ByteValue' is printable or not (in order to avoid corrupting the terminal of invocation when printing) I don't think this function is working since it does not handle UNICODE or character set...*
- [operator const std::vector< char > &](#) () const
- [ByteValue](#) & [operator=](#) (const [ByteValue](#) &val)
- bool [operator==](#) (const [ByteValue](#) &val) const
- bool [operator==](#) (const [Value](#) &val) const override
- void [PrintASCII](#) (std::ostream &os, [VL](#) maxlength) const
- void [PrintASCIIXML](#) (std::ostream &os) const
- void [PrintGroupLength](#) (std::ostream &os)
- void [PrintHex](#) (std::ostream &os, [VL](#) maxlength) const
- void [PrintHexXML](#) (std::ostream &os) const
- void [PrintPNXML](#) (std::ostream &os) const
- template<typename TSwap >
 [std::istream & Read](#) (std::istream &is)
- template<typename TSwap , typename TType >
 [std::istream & Read](#) (std::istream &is, bool readvalues=true)
- void [SetLength](#) ([VL](#) vl) override
- template<typename TSwap , typename TType >
 [std::ostream const & Write](#) (std::ostream &os) const
- template<typename TSwap >
 [std::ostream const & Write](#) (std::ostream &os) const
- bool [WriteBuffer](#) (std::ostream &os) const

## Protected Member Functions

- void [Print](#) (std::ostream &os) const override
- void [SetLengthOnly](#) (VL vl) override

### 10.41.1 Detailed Description

Class to represent binary value (array of bytes)

Note

Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.41.2 Constructor & Destructor Documentation

#### 10.41.2.1 ByteValue() [1/2]

```
gdcm::ByteValue::ByteValue (
    const char * array = nullptr,
    VL const & vl = 0 ) [inline]
```

References [gdcmDebugMacro](#).

#### 10.41.2.2 ByteValue() [2/2]

```
gdcm::ByteValue::ByteValue (
    std::vector< char > & v ) [inline]
```

Warning

casting to uint32\_t

### 10.41.2.3 ~ByteValue()

```
gdcmm::ByteValue::~~ByteValue ( ) [inline], [override]
```

## 10.41.3 Member Function Documentation

### 10.41.3.1 Append()

```
void gdcmm::ByteValue::Append (
    ByteValue const & bv )
```

### 10.41.3.2 Clear()

```
void gdcmm::ByteValue::Clear ( ) [inline], [override], [virtual]
```

Implements [gdcmm::Value](#).

### 10.41.3.3 ComputeLength()

```
VL gdcmm::ByteValue::ComputeLength ( ) const [inline]
```

Referenced by [gdcmm::Fragment::Write\(\)](#).

### 10.41.3.4 Fill()

```
void gdcmm::ByteValue::Fill (
    char c ) [inline]
```

#### Examples

[DuplicatePCDE.cxx](#).

### 10.41.3.5 GetBuffer()

```
bool gdcm::ByteValue::GetBuffer (
    char * buffer,
    unsigned long length ) const
```

#### Examples

[ExtractEncapsulatedFile.cs](#), and [FixJAIBugJPEGLS.cxx](#).

### 10.41.3.6 GetLength()

```
VL gdcm::ByteValue::GetLength ( ) const [inline], [override], [virtual]
```

Implements [gdcm::Value](#).

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::Element< TVR, TVM >::Set\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap\(\)](#), [gdcm::Element< TVR, TVM >::SetNoSwap\(\)](#), [gdcm::Element< TVR, VM::VM1 >::SetByteValueNoSwap\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::SetNoSwap\(\)](#), and [gdcm::Fragment::Write\(\)](#).

### 10.41.3.7 GetPointer()

```
const char * gdcm::ByteValue::GetPointer ( ) const [inline]
```

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::Element< TVR, TVM >::Set\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetByteValue\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetByteValueNoSwap\(\)](#), [gdcm::Element< TVR, TVM >::SetNoSwap\(\)](#), [gdcm::Element< TVR, VM::VM1 >::SetByteValueNoSwap\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetNoSwap\(\)](#).

#### 10.41.3.8 GetVoidPointer() [1/2]

```
void * gdcm::ByteValue::GetVoidPointer ( ) [inline]
```

#### 10.41.3.9 GetVoidPointer() [2/2]

```
const void * gdcm::ByteValue::GetVoidPointer ( ) const [inline]
```

#### Examples

[FixBrokenJ2K.cxx](#).

Referenced by [gdcm::Element< TVR, VM::VM1\\_n >::Set\(\)](#).

#### 10.41.3.10 IsEmpty()

```
bool gdcm::ByteValue::IsEmpty ( ) const [inline]
```

#### 10.41.3.11 IsPrintable()

```
bool gdcm::ByteValue::IsPrintable (
    VL length ) const [inline]
```

Checks whether a 'ByteValue' is printable or not (in order to avoid corrupting the terminal of invocation when printing) I don't think this function is working since it does not handle UNICODE or character set...

#### 10.41.3.12 operator const std::vector< char > &()

```
gdcm::ByteValue::operator const std::vector< char > & ( ) const [inline]
```

#### 10.41.3.13 operator=()

```
ByteValue & gdcm::ByteValue::operator= (
    const ByteValue & val ) [inline]
```



**10.41.3.14 operator==( ) [1/2]**

```
bool gdcmm::ByteValue::operator== (
    const ByteValue & val ) const [inline]
```

**10.41.3.15 operator==( ) [2/2]**

```
bool gdcmm::ByteValue::operator== (
    const Value & val ) const [inline], [override], [virtual]
```

Implements [gdcmm::Value](#).

**10.41.3.16 Print()**

```
void gdcmm::ByteValue::Print (
    std::ostream & os ) const [inline], [override], [protected], [virtual]
```

Reimplemented from [gdcmm::Object](#).

**10.41.3.17 PrintASCII()**

```
void gdcmm::ByteValue::PrintASCII (
    std::ostream & os,
    VL maxlength ) const
```

**10.41.3.18 PrintASCIIXML()**

```
void gdcmm::ByteValue::PrintASCIIXML (
    std::ostream & os ) const
```

**10.41.3.19 PrintGroupLength()**

```
void gdcmm::ByteValue::PrintGroupLength (
    std::ostream & os ) [inline]
```

#### 10.41.3.20 PrintHex()

```
void gdcM::ByteValue::PrintHex (
    std::ostream & os,
    VL maxlength ) const
```

#### 10.41.3.21 PrintHexXML()

```
void gdcM::ByteValue::PrintHexXML (
    std::ostream & os ) const
```

#### 10.41.3.22 PrintPNXML()

```
void gdcM::ByteValue::PrintPNXML (
    std::ostream & os ) const
```

To Print Values in Native DICOM format

#### 10.41.3.23 Read() [1/2]

```
template<typename TSwap >
std::istream & gdcM::ByteValue::Read (
    std::istream & is ) [inline]
```

#### 10.41.3.24 Read() [2/2]

```
template<typename TSwap , typename TType >
std::istream & gdcM::ByteValue::Read (
    std::istream & is,
    bool readvalues = true ) [inline]
```

#### 10.41.3.25 SetLength()

```
void gdcM::ByteValue::SetLength (
    VL vl ) [override], [virtual]
```

Implements [gdcM::Value](#).

#### 10.41.3.26 SetLengthOnly()

```
void gdcm::ByteValue::SetLengthOnly (
    VL vl ) [inline], [override], [protected], [virtual]
```

Reimplemented from [gdcm::Value](#).

#### 10.41.3.27 Write() [1/2]

```
template<typename TSwap , typename TType >
std::ostream const & gdcm::ByteValue::Write (
    std::ostream & os ) const [inline]
```

Referenced by [gdcm::Fragment::Write\(\)](#).

#### 10.41.3.28 Write() [2/2]

```
template<typename TSwap >
std::ostream const & gdcm::ByteValue::Write (
    std::ostream & os ) const [inline]
```

#### 10.41.3.29 WriteBuffer()

```
bool gdcm::ByteValue::WriteBuffer (
    std::ostream & os ) const [inline]
```

The documentation for this class was generated from the following file:

- [gdcmByteValue.h](#)

## 10.42 gdcm::CAPICryptoFactory Class Reference

```
#include <gdcmCAPICryptoFactory.h>
```

Inheritance diagram for gdcm::CAPICryptoFactory:

Collaboration diagram for gdcm::CAPICryptoFactory:

## Public Member Functions

- [CAPICryptoFactory](#) ([CryptoLib](#) id)
- [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()

## Additional Inherited Members

### 10.42.1 Constructor & Destructor Documentation

#### 10.42.1.1 CAPICryptoFactory()

```
gdcmm::CAPICryptoFactory::CAPICryptoFactory (
    CryptoLib id )
```

### 10.42.2 Member Function Documentation

#### 10.42.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax * gdcmm::CAPICryptoFactory::CreateCMSProvider ( ) [virtual]
```

Implements [gdcmm::CryptoFactory](#).

The documentation for this class was generated from the following file:

- [gdcmmCAPICryptoFactory.h](#)

## 10.43 gdcmm::CAPICryptographicMessageSyntax Class Reference

```
#include <gdcmmCAPICryptographicMessageSyntax.h>
```

Inheritance diagram for [gdcmm::CAPICryptographicMessageSyntax](#):

Collaboration diagram for [gdcmm::CAPICryptographicMessageSyntax](#):

## Public Member Functions

- [CAPICryptographicMessageSyntax](#) ()
- [~CAPICryptographicMessageSyntax](#) ()
- bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*decrypt content from a CMS envelopedData structure*
- bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*create a CMS envelopedData structure*
- [CipherTypes](#) [GetCipherType](#) () const
- bool [GetInitialized](#) () const
- bool [ParseCertificateFile](#) (const char \*filename)
- bool [ParseKeyFile](#) (const char \*filename)
- void [SetCipherType](#) ([CipherTypes](#) type)
- bool [SetPassword](#) (const char \*pass, size\_t passLen)

## Additional Inherited Members

### 10.43.1 Constructor & Destructor Documentation

#### 10.43.1.1 CAPICryptographicMessageSyntax()

```
gdcmm::CAPICryptographicMessageSyntax::CAPICryptographicMessageSyntax ( )
```

#### 10.43.1.2 ~CAPICryptographicMessageSyntax()

```
gdcmm::CAPICryptographicMessageSyntax::~~CAPICryptographicMessageSyntax ( )
```

### 10.43.2 Member Function Documentation

#### 10.43.2.1 Decrypt()

```
bool gdcmm::CAPICryptographicMessageSyntax::Decrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [virtual]
```

decrypt content from a CMS envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.43.2.2 Encrypt()

```
bool gdcM::CAPICryptographicMessageSyntax::Encrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [virtual]
```

create a CMS envelopedData structure

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.43.2.3 GetCipherType()

```
CipherTypes gdcM::CAPICryptographicMessageSyntax::GetCipherType ( ) const [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.43.2.4 GetInitialized()

```
bool gdcM::CAPICryptographicMessageSyntax::GetInitialized ( ) const [inline]
```

### 10.43.2.5 ParseCertificateFile()

```
bool gdcM::CAPICryptographicMessageSyntax::ParseCertificateFile (
    const char * filename ) [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.43.2.6 ParseKeyFile()

```
bool gdcM::CAPICryptographicMessageSyntax::ParseKeyFile (
    const char * filename ) [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.43.2.7 SetCipherType()

```
void gdcm::CAPICryptographicMessageSyntax::SetCipherType (
    CipherTypes type ) [virtual]
```

Implements [gdcm::CryptographicMessageSyntax](#).

### 10.43.2.8 SetPassword()

```
bool gdcm::CAPICryptographicMessageSyntax::SetPassword (
    const char * pass,
    size_t passLen ) [virtual]
```

Implements [gdcm::CryptographicMessageSyntax](#).

The documentation for this class was generated from the following file:

- [gdcmCAPICryptographicMessageSyntax.h](#)

## 10.44 gdcm::network::CEchoRQ Class Reference

[CEchoRQ](#).

```
#include <gdcmCEchoMessages.h>
```

Inheritance diagram for `gdcm::network::CEchoRQ`:

Collaboration diagram for `gdcm::network::CEchoRQ`:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery) override

### Public Attributes

- [UIComp](#) [AffectedSOPClassUID](#)
- `uint16_t` [MessageID](#)

### 10.44.1 Detailed Description

[CEchoRQ](#).

this file defines the messages for the cecho action

## 10.44.2 Member Function Documentation

### 10.44.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::CEchoRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [override], [virtual]
```

Implements [gdcM::network::BaseCompositeMessage](#).

## 10.44.3 Member Data Documentation

### 10.44.3.1 AffectedSOPClassUID

```
UIComp gdcM::network::CEchoRQ::AffectedSOPClassUID
```

### 10.44.3.2 MessageID

```
uint16_t gdcM::network::CEchoRQ::MessageID
```

The documentation for this class was generated from the following files:

- [gdcMCEchoMessages.h](#)
- [gdcMDIMSE.h](#)

## 10.45 gdcM::network::CEchoRSP Class Reference

[CEchoRSP](#) this file defines the messages for the cecho action.

```
#include <gdcMCEchoMessages.h>
```

Inheritance diagram for [gdcM::network::CEchoRSP](#):

Collaboration diagram for [gdcM::network::CEchoRSP](#):



## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const `DataSet *inDataSet`)

### 10.45.1 Detailed Description

[CEchoRSP](#) this file defines the messages for the cecho action.

### 10.45.2 Member Function Documentation

#### 10.45.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::CEchoRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmCEchoMessages.h](#)

## 10.46 gdcm::network::CFind Class Reference

```
#include <gdcmDIMSE.h>
```

### 10.46.1 Detailed Description

PS 3.4 - 2009 [Table B.2-1](#) C-STORE STATUS

The documentation for this class was generated from the following file:

- [gdcmDIMSE.h](#)

## 10.47 gdcm::network::CFindCancelRQ Class Reference

[CFindCancelRQ](#) this file defines the messages for the cfind action.

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for `gdcm::network::CFindCancelRQ`:

Collaboration diagram for `gdcm::network::CFindCancelRQ`:

## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### 10.47.1 Detailed Description

[CFindCancelRQ](#) this file defines the messages for the cfind action.

### 10.47.2 Member Function Documentation

#### 10.47.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::CFindCancelRQ::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmCFindMessages.h](#)

## 10.48 gdcm::network::CFindRQ Class Reference

[CFindRQ](#).

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for `gdcm::network::CFindRQ`:

Collaboration diagram for `gdcm::network::CFindRQ`:

## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery) override

### 10.48.1 Detailed Description

[CFindRQ](#).

this file defines the messages for the cfind action

## 10.48.2 Member Function Documentation

### 10.48.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::CFindRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [override], [virtual]
```

Implements [gdcm::network::BaseCompositeMessage](#).

The documentation for this class was generated from the following file:

- [gdcmCFindMessages.h](#)

## 10.49 gdcm::network::CFindRSP Class Reference

[CFindRSP](#) this file defines the messages for the cfind action.

```
#include <gdcmCFindMessages.h>
```

Inheritance diagram for gdcm::network::CFindRSP:

Collaboration diagram for gdcm::network::CFindRSP:

### Public Member Functions

- std::vector< [PresentationDataValue](#) > [ConstructPDVByDataSet](#) (const [DataSet](#) \*inDataSet)

### 10.49.1 Detailed Description

[CFindRSP](#) this file defines the messages for the cfind action.

### 10.49.2 Member Function Documentation

### 10.49.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcM::network::CFindRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcMCFindMessages.h](#)

## 10.50 gdcM::Cleaner Class Reference

[Cleaner](#).

```
#include <gdcMCleaner.h>
```

Inheritance diagram for gdcM::Cleaner:

Collaboration diagram for gdcM::Cleaner:

### Public Member Functions

- [Cleaner](#) ()
- [~Cleaner](#) () override
- bool [Clean](#) ()
  - main loop*
- bool [Empty](#) (DPath const &dpath)
- bool [Empty](#) (PrivateTag const &pt)
- bool [Empty](#) (Tag const &t)
- bool [Empty](#) (VR const &vr)
- [File](#) & [GetFile](#) ()
- bool [Preserve](#) (DPath const &dpath)
- bool [Remove](#) (DPath const &dpath)
- bool [Remove](#) (PrivateTag const &pt)
- bool [Remove](#) (Tag const &t)
- bool [Remove](#) (VR const &vr)
- void [RemoveAllGroupLength](#) (bool remove)
  - Should I remove all group length (deprecated). Default: true.*
- void [RemoveAllIllegal](#) (bool remove)
  - Should I remove all illegal attribute. Default: true.*
- void [RemoveAllMissingPrivateCreator](#) (bool remove)
- bool [RemoveMissingPrivateCreator](#) (Tag const &t)
- bool [Scrub](#) (DPath const &dpath)
- bool [Scrub](#) (PrivateTag const &pt)
- bool [Scrub](#) (Tag const &t)
  - Clean digital tash (typically SIEMENS CSA header):*
- bool [Scrub](#) (VR const &vr)
- void [SetFile](#) (const [File](#) &f)
  - Set/Get File.*

## Static Public Member Functions

- static [SmartPointer< Cleaner > New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

### 10.50.1 Detailed Description

[Cleaner](#).

This class implement the Subject/Observer pattern trigger the following event:

- [AnonymizeEvent](#)
- [IterationEvent](#)
- [StartEvent](#)
- [EndEvent](#)

Examples

[Cleaner.cs](#).

### 10.50.2 Constructor & Destructor Documentation

#### 10.50.2.1 Cleaner()

```
gdcm::Cleaner::Cleaner ( )
```

#### 10.50.2.2 ~Cleaner()

```
gdcm::Cleaner::~~Cleaner ( ) [override]
```

### 10.50.3 Member Function Documentation

### 10.50.3.1 Clean()

```
bool gdcmm::Cleaner::Clean ( )
```

main loop

#### Examples

[Cleaner.cs](#).

### 10.50.3.2 Empty() [1/4]

```
bool gdcmm::Cleaner::Empty (
    DPath const & dpath )
```

### 10.50.3.3 Empty() [2/4]

```
bool gdcmm::Cleaner::Empty (
    PrivateTag const & pt )
```

### 10.50.3.4 Empty() [3/4]

```
bool gdcmm::Cleaner::Empty (
    Tag const & t )
```

#### Examples

[Cleaner.cs](#).

### 10.50.3.5 Empty() [4/4]

```
bool gdcmm::Cleaner::Empty (
    VR const & vr )
```

### 10.50.3.6 GetFile()

```
File & gdcmm::Cleaner::GetFile ( ) [inline]
```

#### Examples

[Cleaner.cs](#).

### 10.50.3.7 New()

```
static SmartPointer< Cleaner > gdcmm::Cleaner::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

#### Examples

[Cleaner.cs](#).

### 10.50.3.8 Preserve()

```
bool gdcmm::Cleaner::Preserve (
    DPath const & dpath )
```

#### Examples

[Cleaner.cs](#).

### 10.50.3.9 Remove() [1/4]

```
bool gdcmm::Cleaner::Remove (
    DPath const & dpath )
```

### 10.50.3.10 Remove() [2/4]

```
bool gdcmm::Cleaner::Remove (
    PrivateTag const & pt )
```

#### 10.50.3.11 Remove() [3/4]

```
bool gdcmm::Cleaner::Remove (
    Tag const & t )
```

##### Examples

[Cleaner.cs](#).

#### 10.50.3.12 Remove() [4/4]

```
bool gdcmm::Cleaner::Remove (
    VR const & vr )
```

#### 10.50.3.13 RemoveAllGroupLength()

```
void gdcmm::Cleaner::RemoveAllGroupLength (
    bool remove )
```

Should I remove all group length (deprecated). Default: true.

#### 10.50.3.14 RemoveAllIllegal()

```
void gdcmm::Cleaner::RemoveAllIllegal (
    bool remove )
```

Should I remove all illegal attribute. Default: true.

#### 10.50.3.15 RemoveAllMissingPrivateCreator()

```
void gdcmm::Cleaner::RemoveAllMissingPrivateCreator (
    bool remove )
```

Should I remove all private tag for which no private creator is found. Default: true



### 10.50.3.16 RemoveMissingPrivateCreator()

```
bool gdcm::Cleaner::RemoveMissingPrivateCreator (
    Tag const & t )
```

Specify a private tag (odd number) without a private creator (root level only for now):

### 10.50.3.17 Scrub() [1/4]

```
bool gdcm::Cleaner::Scrub (
    DPath const & dpath )
```

### 10.50.3.18 Scrub() [2/4]

```
bool gdcm::Cleaner::Scrub (
    PrivateTag const & pt )
```

### 10.50.3.19 Scrub() [3/4]

```
bool gdcm::Cleaner::Scrub (
    Tag const & t )
```

Clean digital tash (typically SIEMENS CSA header):

#### Examples

[Cleaner.cs.](#)

### 10.50.3.20 Scrub() [4/4]

```
bool gdcm::Cleaner::Scrub (
    VR const & vr )
```

### 10.50.3.21 SetFile()

```
void gdcM::Cleaner::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

#### Examples

[Cleaner.cs](#).

The documentation for this class was generated from the following file:

- [gdcMCleaner.h](#)

## 10.51 gdcM::network::CMoveCancelRq Class Reference

```
#include <gdcMCMoveMessages.h>
```

Inheritance diagram for gdcM::network::CMoveCancelRq:

Collaboration diagram for gdcM::network::CMoveCancelRq:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)`

### 10.51.1 Member Function Documentation

#### 10.51.1.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcM::network::CMoveCancelRq::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcMCMoveMessages.h](#)

## 10.52 gdcm::network::CMoveRQ Class Reference

[CMoveRQ](#).

```
#include <gdcmCMoveMessages.h>
```

Inheritance diagram for gdcm::network::CMoveRQ:

Collaboration diagram for gdcm::network::CMoveRQ:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery) override

### 10.52.1 Detailed Description

[CMoveRQ](#).

this file defines the messages for the cmove action

### 10.52.2 Member Function Documentation

#### 10.52.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::CMoveRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [override], [virtual]
```

Implements [gdcm::network::BaseCompositeMessage](#).

The documentation for this class was generated from the following file:

- [gdcmCMoveMessages.h](#)

## 10.53 gdcm::network::CMoveRSP Class Reference

[CMoveRSP](#) this file defines the messages for the cmove action.

```
#include <gdcmCMoveMessages.h>
```

Inheritance diagram for gdcm::network::CMoveRSP:

Collaboration diagram for gdcm::network::CMoveRSP:

## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### 10.53.1 Detailed Description

[CMoveRSP](#) this file defines the messages for the cmove action.

### 10.53.2 Member Function Documentation

#### 10.53.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::CMoveRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmCMoveMessages.h](#)

## 10.54 gdcm::Codec Class Reference

[Codec](#) class.

```
#include <gdcmCodec.h>
```

Inheritance diagram for `gdcm::Codec`:

Collaboration diagram for `gdcm::Codec`:

## Additional Inherited Members

### 10.54.1 Detailed Description

[Codec](#) class.

The documentation for this class was generated from the following file:

- [gdcmCodec.h](#)

## 10.55 gdcm::Coder Class Reference

[Coder](#).

```
#include <gdcmCoder.h>
```

Inheritance diagram for gdcm::Coder:

### Public Member Functions

- virtual [~Coder](#) ()=default
- virtual bool [CanCode](#) ([TransferSyntax](#) const &) const =0  
*Return whether this coder support this transfer syntax (can code it)*
- virtual bool [Code](#) ([DataElement](#) const &in\_, [DataElement](#) &out\_)  
*Code.*

### Protected Member Functions

- virtual bool [InternalCode](#) (const char \*bv, unsigned long len, std::ostream &os)

### 10.55.1 Detailed Description

[Coder](#).

### 10.55.2 Constructor & Destructor Documentation

#### 10.55.2.1 ~Coder()

```
virtual gdcm::Coder::~Coder ( ) [virtual], [default]
```

### 10.55.3 Member Function Documentation

### 10.55.3.1 CanCode()

```
virtual bool gdcm::Coder::CanCode (
    TransferSyntax const & ) const [pure virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implemented in [gdcm::AudioCodec](#), [gdcm::ImageCodec](#), [gdcm::PDFCodec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

### 10.55.3.2 Code()

```
virtual bool gdcm::Coder::Code (
    DataElement const & in_,
    DataElement & out_ ) [inline], [virtual]
```

Code.

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

### 10.55.3.3 InternalCode()

```
virtual bool gdcm::Coder::InternalCode (
    const char * bv,
    unsigned long len,
    std::ostream & os ) [inline], [protected], [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), and [gdcm::JPEG8Codec](#).

The documentation for this class was generated from the following file:

- [gdcmCoder.h](#)

## 10.56 gdcm::CodeString Class Reference

[CodeString](#).

```
#include <gdcmCodeString.h>
```

## Public Types

- typedef [InternalClass::const\\_iterator](#) const\_iterator
- typedef [InternalClass::const\\_reference](#) const\_reference
- typedef [InternalClass::const\\_reverse\\_iterator](#) const\_reverse\_iterator
- typedef [InternalClass::difference\\_type](#) difference\_type
- typedef [InternalClass::iterator](#) iterator
- typedef [InternalClass::pointer](#) pointer
- typedef [InternalClass::reference](#) reference
- typedef [InternalClass::reverse\\_iterator](#) reverse\_iterator
- typedef [InternalClass::size\\_type](#) size\_type
- typedef [InternalClass::value\\_type](#) value\_type

## Public Member Functions

- [CodeString](#) ()  
*CodeString constructors.*
- [CodeString](#) (const [InternalClass](#) &s, [size\\_type](#) pos=0, [size\\_type](#) n=[InternalClass::npos](#))
- [CodeString](#) (const [value\\_type](#) \*s)
- [CodeString](#) (const [value\\_type](#) \*s, [size\\_type](#) n)
- std::string [GetAsString](#) () const  
*Return the full code string as std::string.*
- bool [IsValid](#) () const  
*Check if CodeString obj is correct..*
- [size\\_type](#) [Size](#) () const  
*Return the size of the string.*

## Protected Member Functions

- std::string [TrimInternal](#) () const

## Friends

- bool [operator!=](#) (const [CodeString](#) &ref, const [CodeString](#) &cs)
- std::ostream & [operator<<](#) (std::ostream &os, const [CodeString](#) &str)
- bool [operator==](#) (const [CodeString](#) &ref, const [CodeString](#) &cs)

### 10.56.1 Detailed Description

[CodeString](#).

This is an implementation of DICOM [VR](#): CS The ctor will properly Trim so that operator== is correct.

#### Note

the ctor of [CodeString](#) will Trim the string on the fly so as to remove the extra leading and ending spaces. However it will not perform validation on the fly ([CodeString](#) obj can contains invalid char such as lower cases). This design was chosen to be a little tolerant to broken DICOM implementation, and thus allow user to compare lower case CS from there input file without the need to first rewrite them to get rid of invalid character (validation is a different operation from searching, querying).

#### Warning

when writing out DICOM file it is highly recommended to perform the [IsValid\(\)](#) call, at least to check that the length of the string match the definition in the standard.

## 10.56.2 Member Typedef Documentation

### 10.56.2.1 `const_iterator`

```
typedef InternalClass::const_iterator gdcm::CodeString::const_iterator
```

### 10.56.2.2 `const_reference`

```
typedef InternalClass::const_reference gdcm::CodeString::const_reference
```

### 10.56.2.3 `const_reverse_iterator`

```
typedef InternalClass::const_reverse_iterator gdcm::CodeString::const_reverse_iterator
```

### 10.56.2.4 `difference_type`

```
typedef InternalClass::difference_type gdcm::CodeString::difference_type
```

### 10.56.2.5 `iterator`

```
typedef InternalClass::iterator gdcm::CodeString::iterator
```

### 10.56.2.6 `pointer`

```
typedef InternalClass::pointer gdcm::CodeString::pointer
```



### 10.56.2.7 reference

```
typedef InternalClass::reference gdcm::CodeString::reference
```

### 10.56.2.8 reverse\_iterator

```
typedef InternalClass::reverse_iterator gdcm::CodeString::reverse_iterator
```

### 10.56.2.9 size\_type

```
typedef InternalClass::size_type gdcm::CodeString::size_type
```

### 10.56.2.10 value\_type

```
typedef InternalClass::value_type gdcm::CodeString::value_type
```

## 10.56.3 Constructor & Destructor Documentation

### 10.56.3.1 CodeString() [1/4]

```
gdcm::CodeString::CodeString ( ) [inline]
```

[CodeString](#) constructors.

### 10.56.3.2 CodeString() [2/4]

```
gdcm::CodeString::CodeString (
    const value_type * s ) [inline]
```

### 10.56.3.3 CodeString() [3/4]

```
gdcmm::CodeString::CodeString (
    const value_type * s,
    size_type n ) [inline]
```

### 10.56.3.4 CodeString() [4/4]

```
gdcmm::CodeString::CodeString (
    const InternalClass & s,
    size_type pos = 0,
    size_type n = InternalClass::npos ) [inline]
```

## 10.56.4 Member Function Documentation

### 10.56.4.1 GetAsString()

```
std::string gdcmm::CodeString::GetAsString ( ) const [inline]
```

Return the full code string as std::string.

### 10.56.4.2 IsValid()

```
bool gdcmm::CodeString::IsValid ( ) const
```

Check if [CodeString](#) obj is correct..

### 10.56.4.3 Size()

```
size_type gdcmm::CodeString::Size ( ) const [inline]
```

Return the size of the string.

#### 10.56.4.4 TrimInternal()

```
std::string gdcm::CodeString::TrimInternal ( ) const [inline], [protected]
```

### 10.56.5 Friends And Related Function Documentation

#### 10.56.5.1 operator"!="

```
bool operator!= (
    const CodeString & ref,
    const CodeString & cs ) [friend]
```

#### 10.56.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const CodeString & str ) [friend]
```

#### 10.56.5.3 operator==

```
bool operator== (
    const CodeString & ref,
    const CodeString & cs ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmCodeString.h](#)

## 10.57 gdcm::Command Class Reference

[Command](#) superclass for callback/observer methods.

```
#include <gdcmCommand.h>
```

Inheritance diagram for gdcm::Command:

Collaboration diagram for gdcm::Command:

## Public Member Functions

- [Command](#) (const [Command](#) &)=delete
  - virtual void [Execute](#) (const [Subject](#) \*caller, const [Event](#) &event)=0
  - virtual void [Execute](#) ([Subject](#) \*caller, const [Event](#) &event)=0
- Abstract method that defines the action to be taken by the command.*
- void [operator=](#) (const [Command](#) &)=delete

## Protected Member Functions

- [Command](#) ()
- [~Command](#) () override

### 10.57.1 Detailed Description

[Command](#) superclass for callback/observer methods.

See also

[Subject](#)

### 10.57.2 Constructor & Destructor Documentation

#### 10.57.2.1 [Command\(\)](#) [1/2]

```
gdcmm::Command::Command (
    const Command & ) [delete]
```

#### 10.57.2.2 [Command\(\)](#) [2/2]

```
gdcmm::Command::Command ( ) [protected]
```

#### 10.57.2.3 [~Command\(\)](#)

```
gdcmm::Command::~~Command ( ) [override], [protected]
```

## 10.57.3 Member Function Documentation

### 10.57.3.1 Execute() [1/2]

```
virtual void gdcm::Command::Execute (
    const Subject * caller,
    const Event & event ) [pure virtual]
```

Abstract method that defines the action to be taken by the command. This variant is expected to be used when requests comes from a const [Object](#)

Implemented in [gdcm::SimpleMemberCommand< T >](#), and [gdcm::MemberCommand< T >](#).

### 10.57.3.2 Execute() [2/2]

```
virtual void gdcm::Command::Execute (
    Subject * caller,
    const Event & event ) [pure virtual]
```

Abstract method that defines the action to be taken by the command.

Implemented in [gdcm::SimpleMemberCommand< T >](#), and [gdcm::MemberCommand< T >](#).

### 10.57.3.3 operator=()

```
void gdcm::Command::operator= (
    const Command & ) [delete]
```

The documentation for this class was generated from the following file:

- [gdcmCommand.h](#)

## 10.58 gdcm::CommandDataSet Class Reference

Class to represent a [Command DataSet](#).

```
#include <gdcmCommandDataSet.h>
```

Inheritance diagram for `gdcm::CommandDataSet`:

Collaboration diagram for `gdcm::CommandDataSet`:

## Public Member Functions

- [CommandDataSet](#) ()=default
- [~CommandDataSet](#) ()=default
- void [Insert](#) (const [DataElement](#) &de)
- std::istream & [Read](#) (std::istream &is)  
*Read.*
- void [Replace](#) (const [DataElement](#) &de)
- std::ostream & [Write](#) (std::ostream &os) const  
*Write.*

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [CommandDataSet](#) &\_val)

## Additional Inherited Members

### 10.58.1 Detailed Description

Class to represent a [Command DataSet](#).

See also

[DataSet](#)

### 10.58.2 Constructor & Destructor Documentation

#### 10.58.2.1 CommandDataSet()

```
gdcm::CommandDataSet::CommandDataSet ( ) [default]
```

#### 10.58.2.2 ~CommandDataSet()

```
gdcm::CommandDataSet::~~CommandDataSet ( ) [default]
```

### 10.58.3 Member Function Documentation

### 10.58.3.1 Insert()

```
void gdcm::CommandDataSet::Insert (
    const DataElement & de ) [inline]
```

References [gdcmErrorMacro](#), [gdcm::Tag::GetGroup\(\)](#), and [gdcm::DataElement::GetTag\(\)](#).

### 10.58.3.2 Read()

```
std::istream & gdcm::CommandDataSet::Read (
    std::istream & is )
```

Read.

### 10.58.3.3 Replace()

```
void gdcm::CommandDataSet::Replace (
    const DataElement & de ) [inline]
```

References [gdcm::DataElement::GetTag\(\)](#).

### 10.58.3.4 Write()

```
std::ostream & gdcm::CommandDataSet::Write (
    std::ostream & os ) const
```

Write.

## 10.58.4 Friends And Related Function Documentation

### 10.58.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CommandDataSet & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmCommandDataSet.h](#)

## 10.59 gdcm::network::CompositeMessageFactory Class Reference

[CompositeMessageFactory](#).

```
#include <gdcmCompositeMessageFactory.h>
```

### Static Public Member Functions

- static std::vector< [PresentationDataValue](#) > [ConstructCEchoRQ](#) (const [ULConnection](#) &inConnection)
- static std::vector< [PresentationDataValue](#) > [ConstructCFindRQ](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructCMoveRQ](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructCStoreRQ](#) (const [ULConnection](#) &inConnection, const [File](#) &file, bool writeDataSet=true)
- static std::vector< [PresentationDataValue](#) > [ConstructCStoreRSP](#) (const [DataSet](#) \*inDataSet, const [BasePDU](#) \*inPC)

### 10.59.1 Detailed Description

[CompositeMessageFactory](#).

This class constructs PDataPDUs, but that have been specifically constructed for the composite DICOM services (C-Echo, C-Find, C-Get, C-Move, and C-Store). It will also handle parsing the incoming data to determine which of the CompositePDUs the incoming data is, and so therefore allowing the scu to determine what to do with incoming data (if acting as a storescp server, for instance).

### 10.59.2 Member Function Documentation

#### 10.59.2.1 ConstructCEchoRQ()

```
static std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCEchoRQ (
    const ULConnection & inConnection ) [static]
```

#### 10.59.2.2 ConstructCFindRQ()

```
static std::vector< PresentationDataValue > gdcm::network::CompositeMessageFactory::ConstructCFindRQ (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [static]
```



### 10.59.2.3 ConstructCMoveRQ()

```
static std::vector< PresentationDataValue > gdcmm::network::CompositeMessageFactory::ConstructC↵
CMoveRQ (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [static]
```

### 10.59.2.4 ConstructCStoreRQ()

```
static std::vector< PresentationDataValue > gdcmm::network::CompositeMessageFactory::ConstructC↵
CStoreRQ (
    const ULConnection & inConnection,
    const File & file,
    bool writeDataSet = true ) [static]
```

### 10.59.2.5 ConstructCStoreRSP()

```
static std::vector< PresentationDataValue > gdcmm::network::CompositeMessageFactory::ConstructC↵
CStoreRSP (
    const DataSet * inDataSet,
    const BasePDU * inPC ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmmCompositeMessageFactory.h](#)

## 10.60 gdcmm::CompositeNetworkFunctions Class Reference

Composite Network Functions.

```
#include <gdcmmCompositeNetworkFunctions.h>
```

### Public Types

- typedef std::vector< [KeyValuePairType](#) > [KeyValuePairArrayType](#)
- typedef std::pair< [Tag](#), std::string > [KeyValuePairType](#)

## Static Public Member Functions

- static bool [CEcho](#) (const char \*remote, uint16\_t portno, const char \*aetitle=nullptr, const char \*call=nullptr)
- static bool [CFind](#) (const char \*remote, uint16\_t portno, const [BaseRootQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle=nullptr, const char \*call=nullptr)
- static bool [CMove](#) (const char \*remote, uint16\_t portno, const [BaseRootQuery](#) \*query, uint16\_t portscp, const char \*aetitle=nullptr, const char \*call=nullptr, const char \*outputdir=nullptr)
- static [BaseRootQuery](#) \* [ConstructQuery](#) ([ERootType](#) inRootType, [EQueryLevel](#) inQueryLevel, const [DataSet](#) &queryds, [EQueryType](#) queryType=[eFind](#))
- static [BaseRootQuery](#) \* [ConstructQuery](#) ([ERootType](#) inRootType, [EQueryLevel](#) inQueryLevel, const [KeyValuePairArrayType](#) &keys, [EQueryType](#) queryType=[eFind](#))
- static bool [CStore](#) (const char \*remote, uint16\_t portno, const [Directory::FileNamesType](#) &filenames, const char \*aetitle=nullptr, const char \*call=nullptr)

### 10.60.1 Detailed Description

Composite Network Functions.

These functions provide a generic API to the DICOM functions implemented in GDCM. Advanced users can use this code as a template for building their own versions of these functions (for instance, to provide progress bars or some other way of handling returned query information), but for most users, these functions should be sufficient to interface with a PACS to a local machine. Note that these functions are not contained within a static class or some other class-style interface, because multiple connections can be instantiated in the same program. The DICOM standard is much more function oriented rather than class oriented in this instance, so the design of this API reflects that functional approach. These functions implements the following SCU operations:

- C-ECHO SCU
- C-FIND SCU
- C-STORE SCU
- C-MOVE SCU (+internal C-STORE SCP)

#### Examples

[SendFileSCU.cs](#).

### 10.60.2 Member Typedef Documentation

#### 10.60.2.1 KeyValuePairArrayType

```
typedef std::vector< KeyValuePairType > gdcml::CompositeNetworkFunctions::KeyValuePairArrayType
```

### 10.60.2.2 KeyValuePairType

```
typedef std::pair<Tag, std::string> gdcm::CompositeNetworkFunctions::KeyValuePairType
```

## 10.60.3 Member Function Documentation

### 10.60.3.1 CEcho()

```
static bool gdcm::CompositeNetworkFunctions::CEcho (
    const char * remote,
    uint16_t portno,
    const char * aetitle = nullptr,
    const char * call = nullptr ) [static]
```

The most basic network function. Use this function to ensure that the remote server is responding on the given IP and port number as expected.

#### Parameters

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP'

#### Warning

This is an error to set remote to NULL or portno to 0

#### Returns

true if it worked.

#### Examples

[SendFileSCU.cs](#).

### 10.60.3.2 CFind()

```
static bool gdcm::CompositeNetworkFunctions::CFind (
    const char * remote,
    uint16_t portno,
    const BaseRootQuery * query,
    std::vector< DataSet > & retDataSets,
```

```
const char * aetitle = nullptr,  
const char * call = nullptr ) [static]
```

This function will use the provided query to determine what files a remote server contains that match the query strings. The return is a vector of datasets that contain tags as reported by the server. If the dataset is empty, then it is possible that an error condition was encountered; in which case, the user should monitor the error and warning streams.

**Parameters**

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP'

**Warning**

This is an error to set remote to NULL or portno to 0

**Returns**

true if it worked.

**10.60.3.3 CMove()**

```
static bool gdcm::CompositeNetworkFunctions::CMove (
    const char * remote,
    uint16_t portno,
    const BaseRootQuery * query,
    uint16_t portscp,
    const char * aetitle = nullptr,
    const char * call = nullptr,
    const char * outputdir = nullptr ) [static]
```

This function will use the provided query to get files from a remote server. NOTE that this functionality is essentially equivalent to C-GET in the DICOM standard; however, C-GET has been deprecated, so this function allows for the user to ask a remote server for files matching a query and return them to the local machine. Files will be written to the given output directory. If the operation succeeds, the function returns true. This function is a prime candidate for being overwritten by expert users; if the datasets should remain in memory, for instance, that behavior can be changed by creating a user-level version of this function.

**Parameters**

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP' This is an error to set remote to NULL or portno to 0 when
<i>outputdir</i>	is not set default to current dir ('.')

**Returns**

true if it worked.

#### 10.60.3.4 ConstructQuery() [1/2]

```
static BaseRootQuery * gdc::CompositeNetworkFunctions::ConstructQuery (
    ERootType inRootType,
    EQueryLevel inQueryLevel,
    const DataSet & queryds,
    EQueryType queryType = eFind ) [static]
```

This function will take a list of strings and tags and fill in a query that can be used for either CFind or CMove (depending on the input boolean

##### Parameters

<i>inMove</i> ).	Note that the caller is responsible for deleting the constructed query. This function is used to build both a move and a find query (true for inMove if it's move, false if it's find)
------------------	--

#### 10.60.3.5 ConstructQuery() [2/2]

```
static BaseRootQuery * gdc::CompositeNetworkFunctions::ConstructQuery (
    ERootType inRootType,
    EQueryLevel inQueryLevel,
    const KeyValuePairArrayType & keys,
    EQueryType queryType = eFind ) [static]
```

#### Deprecated

#### 10.60.3.6 CStore()

```
static bool gdc::CompositeNetworkFunctions::CStore (
    const char * remote,
    uint16_t portno,
    const Directory::FileNamesType & filenames,
    const char * aetitle = nullptr,
    const char * call = nullptr ) [static]
```

This function will place the provided files into the remote server. The function returns true if it worked for all files.

##### Warning

the server side can refuse an association on a given file

#### Parameters

<i>aetitle</i>	when not set will default to 'GDCMSCU'
<i>call</i>	when not set will default to 'ANY-SCP'

#### Warning

This is an error to set remote to NULL or portno to 0

#### Returns

true if it worked for all files

#### Examples

[SendFileSCU.cs](#).

The documentation for this class was generated from the following file:

- [gdcmCompositeNetworkFunctions.h](#)

## 10.61 gdcm::ConstCharWrapper Class Reference

Do not use me.

```
#include <gdcmConstCharWrapper.h>
```

### Public Member Functions

- [ConstCharWrapper](#) (const char \*i=0)
- [operator const char \\*](#) () const

#### 10.61.1 Detailed Description

Do not use me.

#### 10.61.2 Constructor & Destructor Documentation

### 10.61.2.1 ConstCharWrapper()

```
gdcm::ConstCharWrapper::ConstCharWrapper (
    const char * i = 0 ) [inline]
```

## 10.61.3 Member Function Documentation

### 10.61.3.1 operator const char \*()

```
gdcm::ConstCharWrapper::operator const char * ( ) const [inline]
```

The documentation for this class was generated from the following file:

- [gdcmConstCharWrapper.h](#)

## 10.62 gdcm::CP246ExplicitDataElement Class Reference

Class to read/write a [DataElement](#) as CP246Explicit Data [Element](#).

```
#include <gdcmCP246ExplicitDataElement.h>
```

Inheritance diagram for gdcm::CP246ExplicitDataElement:

Collaboration diagram for gdcm::CP246ExplicitDataElement:

### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)



## Additional Inherited Members

### 10.62.1 Detailed Description

Class to read/write a [DataElement](#) as CP246Explicit Data [Element](#).

#### Note

Some system are producing SQ, declare them as UN, but encode the SQ as 'Explicit' instead of Implicit

### 10.62.2 Member Function Documentation

#### 10.62.2.1 GetLength()

```
VL gdcm::CP246ExplicitDataElement::GetLength ( ) const
```

#### 10.62.2.2 Read()

```
template<typename TSwap >  
std::istream & gdcm::CP246ExplicitDataElement::Read (  
    std::istream & is )
```

#### 10.62.2.3 ReadPreValue()

```
template<typename TSwap >  
std::istream & gdcm::CP246ExplicitDataElement::ReadPreValue (  
    std::istream & is )
```

#### 10.62.2.4 ReadValue()

```
template<typename TSwap >  
std::istream & gdcm::CP246ExplicitDataElement::ReadValue (  
    std::istream & is,  
    bool readvalues = true )
```

### 10.62.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream & gdcm::CP246ExplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length )
```

The documentation for this class was generated from the following file:

- [gdcmCP246ExplicitDataElement.h](#)

## 10.63 gdcm::CryptoFactory Class Reference

Class to do handle the crypto factory.

```
#include <gdcmCryptoFactory.h>
```

Inheritance diagram for gdcm::CryptoFactory:

### Public Types

- enum [CryptoLib](#) {  
[DEFAULT](#) = 0 ,  
[OPENSSL](#) = 1 ,  
[CAPI](#) = 2 ,  
[OPENSSL7](#) = 3 }

### Public Member Functions

- virtual [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()=0

### Static Public Member Functions

- static [CryptoFactory](#) \* [GetFactoryInstance](#) ([CryptoLib](#) id=[DEFAULT](#))

### Protected Member Functions

- [CryptoFactory](#) ()=default
- [CryptoFactory](#) ([CryptoLib](#) id)
- [~CryptoFactory](#) ()=default

### 10.63.1 Detailed Description

Class to do handle the crypto factory.

GDCM needs to access in a platform independent way the user specified crypto engine. It can be:

- CAPI (windows only)
- OPENSSL (portable)
- OPENSSL7 (portable) By default the factory will try: CAPI if on windows OPENSSL if possible OPENSSL7 when older OpenSSL is used.

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.63.2 Member Enumeration Documentation

#### 10.63.2.1 CryptoLib

```
enum gdcm::CryptoFactory::CryptoLib
```

##### Enumerator

DEFAULT	
OPENSSL	
CAPI	
OPENSSL7	

### 10.63.3 Constructor & Destructor Documentation

#### 10.63.3.1 CryptoFactory() [1/2]

```
gdcm::CryptoFactory::CryptoFactory (  
    CryptoLib id ) [inline], [protected]
```

### 10.63.3.2 CryptoFactory() [2/2]

```
gdcm::CryptoFactory::CryptoFactory ( ) [protected], [default]
```

### 10.63.3.3 ~CryptoFactory()

```
gdcm::CryptoFactory::~~CryptoFactory ( ) [protected], [default]
```

## 10.63.4 Member Function Documentation

### 10.63.4.1 CreateCMSProvider()

```
virtual CryptographicMessageSyntax * gdcm::CryptoFactory::CreateCMSProvider ( ) [pure virtual]
```

Implemented in [gdcm::CAPICryptoFactory](#), [gdcm::OpenSSLCryptoFactory](#), and [gdcm::OpenSSLP7CryptoFactory](#).

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.63.4.2 GetFactoryInstance()

```
static CryptoFactory * gdcm::CryptoFactory::GetFactoryInstance (
    CryptoLib id = DEFAULT ) [static]
```

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

The documentation for this class was generated from the following file:

- [gdcmCryptoFactory.h](#)

## 10.64 gdcm::CryptographicMessageSyntax Class Reference

```
#include <gdcmCryptographicMessageSyntax.h>
```

Inheritance diagram for `gdcm::CryptographicMessageSyntax`:

## Public Types

- enum [CipherTypes](#) {  
[DES3\\_CIPHER](#) ,  
[AES128\\_CIPHER](#) ,  
[AES192\\_CIPHER](#) ,  
[AES256\\_CIPHER](#) }

## Public Member Functions

- [CryptographicMessageSyntax](#) ()=default
- [CryptographicMessageSyntax](#) (const [CryptographicMessageSyntax](#) &)=delete
- virtual [~CryptographicMessageSyntax](#) ()=default
- virtual bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const =0  
*decrypt content from a CMS envelopedData structure*
- virtual bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const =0  
*create a CMS envelopedData structure*
- virtual [CipherTypes](#) [GetCipherType](#) () const =0
- void [operator=](#) (const [CryptographicMessageSyntax](#) &)=delete
- virtual bool [ParseCertificateFile](#) (const char \*filename)=0
- virtual bool [ParseKeyFile](#) (const char \*filename)=0
- virtual void [SetCipherType](#) ([CipherTypes](#) type)=0
- virtual bool [SetPassword](#) (const char \*pass, size\_t passLen)=0

### 10.64.1 Detailed Description

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.64.2 Member Enumeration Documentation

#### 10.64.2.1 CipherTypes

enum [gdcmm::CryptographicMessageSyntax::CipherTypes](#)

#### Enumerator

<a href="#">DES3_CIPHER</a>	
<a href="#">AES128_CIPHER</a>	
<a href="#">AES192_CIPHER</a>	
<a href="#">AES256_CIPHER</a>	

### 10.64.3 Constructor & Destructor Documentation

#### 10.64.3.1 CryptographicMessageSyntax() [1/2]

```
gdcM::CryptographicMessageSyntax::CryptographicMessageSyntax ( ) [default]
```

#### 10.64.3.2 ~CryptographicMessageSyntax()

```
virtual gdcM::CryptographicMessageSyntax::~~CryptographicMessageSyntax ( ) [virtual], [default]
```

#### 10.64.3.3 CryptographicMessageSyntax() [2/2]

```
gdcM::CryptographicMessageSyntax::CryptographicMessageSyntax (
    const CryptographicMessageSyntax & ) [delete]
```

### 10.64.4 Member Function Documentation

#### 10.64.4.1 Decrypt()

```
virtual bool gdcM::CryptographicMessageSyntax::Decrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [pure virtual]
```

decrypt content from a CMS envelopedData structure

Implemented in [gdcM::CAPICryptographicMessageSyntax](#), [gdcM::OpenSSLCryptographicMessageSyntax](#), and [gdcM::OpenSSLP7CryptographicMessageSyntax](#).

#### 10.64.4.2 Encrypt()

```
virtual bool gdcmm::CryptographicMessageSyntax::Encrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [pure virtual]
```

create a CMS envelopedData structure

Implemented in [gdcmm::CAPICryptographicMessageSyntax](#), [gdcmm::OpenSSLCryptographicMessageSyntax](#), and [gdcmm::OpenSSL7CryptographicMessageSyntax](#).

#### 10.64.4.3 GetCipherType()

```
virtual CipherTypes gdcmm::CryptographicMessageSyntax::GetCipherType ( ) const [pure virtual]
```

Implemented in [gdcmm::CAPICryptographicMessageSyntax](#), [gdcmm::OpenSSLCryptographicMessageSyntax](#), and [gdcmm::OpenSSL7CryptographicMessageSyntax](#).

#### 10.64.4.4 operator=()

```
void gdcmm::CryptographicMessageSyntax::operator= (
    const CryptographicMessageSyntax & ) [delete]
```

#### 10.64.4.5 ParseCertificateFile()

```
virtual bool gdcmm::CryptographicMessageSyntax::ParseCertificateFile (
    const char * filename ) [pure virtual]
```

Implemented in [gdcmm::CAPICryptographicMessageSyntax](#), [gdcmm::OpenSSLCryptographicMessageSyntax](#), and [gdcmm::OpenSSL7CryptographicMessageSyntax](#).

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

#### 10.64.4.6 ParseKeyFile()

```
virtual bool gdcM::CryptographicMessageSyntax::ParseKeyFile (
    const char * filename ) [pure virtual]
```

Implemented in [gdcM::CAPICryptographicMessageSyntax](#), [gdcM::OpenSSLCryptographicMessageSyntax](#), and [gdcM::OpenSSL7CryptographicMessageSyntax](#).

#### 10.64.4.7 SetCipherType()

```
virtual void gdcM::CryptographicMessageSyntax::SetCipherType (
    CipherTypes type ) [pure virtual]
```

Implemented in [gdcM::CAPICryptographicMessageSyntax](#), [gdcM::OpenSSLCryptographicMessageSyntax](#), and [gdcM::OpenSSL7CryptographicMessageSyntax](#).

#### 10.64.4.8 SetPassword()

```
virtual bool gdcM::CryptographicMessageSyntax::SetPassword (
    const char * pass,
    size_t passLen ) [pure virtual]
```

Implemented in [gdcM::OpenSSL7CryptographicMessageSyntax](#), [gdcM::CAPICryptographicMessageSyntax](#), and [gdcM::OpenSSLCryptographicMessageSyntax](#).

The documentation for this class was generated from the following file:

- [gdcMCryptographicMessageSyntax.h](#)

## 10.65 gdcM::CSAElement Class Reference

Class to represent a CSA [Element](#).

```
#include <gdcMCSAElement.h>
```

Collaboration diagram for gdcM::CSAElement:



## Public Member Functions

- [CSAElement](#) (const [CSAElement](#) &\_val)
- [CSAElement](#) (unsigned int kf=0)
- const [ByteValue](#) \* [GetByteValue](#) () const
- unsigned int [GetKey](#) () const  
*Set/Get Key.*
- const char \* [GetName](#) () const  
*Set/Get Name.*
- unsigned int [GetNoOfItems](#) () const  
*Set/Get NoOfItems.*
- unsigned int [GetSyngoDT](#) () const  
*Set/Get SyngoDT.*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const  
*Set/Get Value (bytes array, SQ of items, SQ of fragments):*
- const [VM](#) & [GetVM](#) () const  
*Set/Get VM.*
- [VR](#) const & [GetVR](#) () const  
*Set/Get VR.*
- bool [IsEmpty](#) () const  
*Check if CSA Element is empty.*
- bool [operator<](#) (const [CSAElement](#) &de) const
- [CSAElement](#) & [operator=](#) (const [CSAElement](#) &de)=default
- bool [operator==](#) (const [CSAElement](#) &de) const
- void [SetByteValue](#) (const char \*array, [VL](#) length)  
*Set.*
- void [SetKey](#) (unsigned int key)
- void [SetName](#) (const char \*name)
- void [SetNoOfItems](#) (unsigned int items)
- void [SetSyngoDT](#) (unsigned int syngodt)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVM](#) (const [VM](#) &vm)
- void [SetVR](#) ([VR](#) const &vr)

## Protected Types

- typedef [SmartPointer](#)< [Value](#) > [DataPtr](#)

## Protected Attributes

- [DataPtr](#) [DataField](#)
- unsigned int [KeyField](#)
- std::string [NameField](#)
- unsigned int [NoOfItemsField](#)
- unsigned int [SyngoDTField](#)
- [VM](#) [ValueMultiplicityField](#)
- [VR](#) [VRField](#)

## Friends

- `std::ostream & operator<< (std::ostream &os, const CSAElement &val)`

### 10.65.1 Detailed Description

Class to represent a CSA [Element](#).

See also

[CSAHeader](#)

Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

### 10.65.2 Member Typedef Documentation

#### 10.65.2.1 DataPtr

```
typedef SmartPointer<Value> gdcm::CSAElement::DataPtr [protected]
```

### 10.65.3 Constructor & Destructor Documentation

#### 10.65.3.1 CSAElement() [1/2]

```
gdcm::CSAElement::CSAElement (  
    unsigned int kf = 0 ) [inline]
```

#### 10.65.3.2 CSAElement() [2/2]

```
gdcm::CSAElement::CSAElement (  
    const CSAElement & _val ) [inline]
```

## 10.65.4 Member Function Documentation

### 10.65.4.1 GetByteValue()

```
const ByteValue * gdcm::CSAElement::GetByteValue ( ) const [inline]
```

Return the [Value](#) of [CSAElement](#) as a [ByteValue](#) (if possible)

#### Warning

: You need to check for NULL return value

#### Examples

[DumpSiemensBase64.cxx](#), and [MrProtocol.cxx](#).

### 10.65.4.2 GetKey()

```
unsigned int gdcm::CSAElement::GetKey ( ) const [inline]
```

Set/Get Key.

Referenced by [operator<\(\)](#).

### 10.65.4.3 GetName()

```
const char * gdcm::CSAElement::GetName ( ) const [inline]
```

Set/Get Name.

### 10.65.4.4 GetNoOfItems()

```
unsigned int gdcm::CSAElement::GetNoOfItems ( ) const [inline]
```

Set/Get NoOfItems.

#### 10.65.4.5 GetSyngoDT()

```
unsigned int gdcm::CSAElement::GetSyngoDT ( ) const [inline]
```

Set/Get SyngoDT.

#### 10.65.4.6 GetValue() [1/2]

```
Value & gdcm::CSAElement::GetValue ( ) [inline]
```

#### 10.65.4.7 GetValue() [2/2]

```
Value const & gdcm::CSAElement::GetValue ( ) const [inline]
```

Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):

#### Examples

[csa2img.cxx](#).

#### 10.65.4.8 GetVM()

```
const VM & gdcm::CSAElement::GetVM ( ) const [inline]
```

Set/Get [VM](#).

#### 10.65.4.9 GetVR()

```
VR const & gdcm::CSAElement::GetVR ( ) const [inline]
```

Set/Get [VR](#).

#### 10.65.4.10 IsEmpty()

```
bool gdcm::CSAElement::IsEmpty ( ) const [inline]
```

Check if CSA [Element](#) is empty.

##### Examples

[csa2img.cxx](#).

#### 10.65.4.11 operator<()

```
bool gdcm::CSAElement::operator< (
    const CSAElement & de ) const [inline]
```

References [GetKey\(\)](#).

#### 10.65.4.12 operator=()

```
CSAElement & gdcm::CSAElement::operator= (
    const CSAElement & de ) [default]
```

#### 10.65.4.13 operator==()

```
bool gdcm::CSAElement::operator== (
    const CSAElement & de ) const [inline]
```

References [KeyField](#), [NameField](#), [SyngoDTField](#), [ValueMultiplicityField](#), and [VRField](#).

#### 10.65.4.14 SetByteValue()

```
void gdcm::CSAElement::SetByteValue (
    const char * array,
    VL length ) [inline]
```

Set.

**10.65.4.15 SetKey()**

```
void gdcM::CSAElement::SetKey (
    unsigned int key ) [inline]
```

**10.65.4.16 SetName()**

```
void gdcM::CSAElement::SetName (
    const char * name ) [inline]
```

**10.65.4.17 SetNoOfItems()**

```
void gdcM::CSAElement::SetNoOfItems (
    unsigned int items ) [inline]
```

**10.65.4.18 SetSyngoDT()**

```
void gdcM::CSAElement::SetSyngoDT (
    unsigned int syngodt ) [inline]
```

**10.65.4.19 SetValue()**

```
void gdcM::CSAElement::SetValue (
    Value const & vl ) [inline]
```

**10.65.4.20 SetVM()**

```
void gdcM::CSAElement::SetVM (
    const VM & vm ) [inline]
```

#### 10.65.4.21 SetVR()

```
void gdcm::CSAElement::SetVR (
    VR const & vr ) [inline]
```

### 10.65.5 Friends And Related Function Documentation

#### 10.65.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const CSAElement & val ) [friend]
```

### 10.65.6 Member Data Documentation

#### 10.65.6.1 DataField

```
DataPtr gdcm::CSAElement::DataField [protected]
```

#### 10.65.6.2 KeyField

```
unsigned int gdcm::CSAElement::KeyField [protected]
```

Referenced by [operator==\(\)](#).

#### 10.65.6.3 NameField

```
std::string gdcm::CSAElement::NameField [protected]
```

Referenced by [operator==\(\)](#).

#### 10.65.6.4 NoOfItemsField

```
unsigned int gdcm::CSAElement::NoOfItemsField [protected]
```

#### 10.65.6.5 SyngoDTField

```
unsigned int gdcm::CSAElement::SyngoDTField [protected]
```

Referenced by [operator==\(\)](#).

#### 10.65.6.6 ValueMultiplicityField

```
VM gdcm::CSAElement::ValueMultiplicityField [protected]
```

Referenced by [operator==\(\)](#).

#### 10.65.6.7 VRField

```
VR gdcm::CSAElement::VRField [protected]
```

Referenced by [operator==\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmCSAElement.h](#)

## 10.66 gdcm::CSAHeader Class Reference

Class for [CSAHeader](#).

```
#include <gdcmCSAHeader.h>
```

### Public Types

- enum [CSAHeaderType](#) {  
    [UNKNOWN](#) = 0 ,  
    [SV10](#) ,  
    [NOMAGIC](#) ,  
    [DATASET\\_FORMAT](#) ,  
    [INTERFILE](#) ,  
    [ZEROED\\_OUT](#) }

*Diverse format of [CSAHeader](#) as found 'in the wild'.*



## Public Member Functions

- [CSAHeader](#) ()
- [~CSAHeader](#) ()=default
- bool [FindCSAElementByName](#) (const char \*name)
- const [CSAElement](#) & [GetCSAElementByName](#) (const char \*name)
- const [DataSet](#) & [GetDataSet](#) () const  
*Return the [DataSet](#) output (use only if Format == DATASET\_FORMAT )*
- [CSAHeaderType](#) [GetFormat](#) () const
- const char \* [GetInterfile](#) () const  
*Return the string output (use only if Format == Interfile)*
- bool [GetMrProtocol](#) (const [DataSet](#) &ds, [MrProtocol](#) &mrProtocol)  
*Retrieve the ASCII portion stored within the MrProtocol/MrPhoenixProtocol:*
- bool [LoadFromDataElement](#) ([DataElement](#) const &de)  
*Decode the [CSAHeader](#) from element 'de'.*
- void [Print](#) (std::ostream &os) const  
*Print the [CSAHeader](#) (use only if Format == SV10 or NOMAGIC)*

## Static Public Member Functions

- static const [PrivateTag](#) & [GetCSADataInfo](#) ()
- static const [PrivateTag](#) & [GetCSAImageHeaderInfoTag](#) ()
- static const [PrivateTag](#) & [GetCSASeriesHeaderInfoTag](#) ()

## Protected Member Functions

- const [CSAElement](#) & [GetCSAEEnd](#) () const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [CSAHeader](#) &d)

### 10.66.1 Detailed Description

Class for [CSAHeader](#).

SIEMENS store private information in tag (0x0029,0x10,"SIEMENS CSA HEADER") this class is meant for user wishing to access values stored within this private attribute. There are basically two main 'format' for this attribute : SV10/↔ NOMAGIC and DATASET\_FORMAT SV10 and NOMAGIC are from a user prospective identical, see CSAHeader.xml for possible name / value stored in this format. DATASET\_FORMAT is in fact simply just another DICOM dataset (implicit) with -currently unknown- value. This can be only be printed for now.

### Warning

Everything you do with this code is at your own risk, since decoding process was not written from specification documents.

the API of this class might change.

**Todo** MrEvaProtocol in 29,1020 contains ^M that would be nice to get rid of on UNIX system...

### See also

[PDBHeader](#)

External references: 5.1.3.2.4.1 MEDCOM History Information and 5.1.4.3 CSA Non-Image [Module](#) in [http://tamsinfo.toshiba.com/docrequest/pdf/E.Soft\\_v2.0.pdf](http://tamsinfo.toshiba.com/docrequest/pdf/E.Soft_v2.0.pdf)

### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

## 10.66.2 Member Enumeration Documentation

### 10.66.2.1 CSAHeaderType

enum [gdcm::CSAHeader::CSAHeaderType](#)

Diverse format of [CSAHeader](#) as found 'in the wild'.

#### Enumerator

UNKNOWN	
SV10	
NOMAGIC	
DATASET_FORMAT	
INTERFILE	
ZEROED_OUT	

## 10.66.3 Constructor & Destructor Documentation

### 10.66.3.1 CSAHeader()

```
gdcm::CSAHeader::CSAHeader ( ) [inline]
```

### 10.66.3.2 ~CSAHeader()

```
gdcm::CSAHeader::~~CSAHeader ( ) [default]
```

## 10.66.4 Member Function Documentation

### 10.66.4.1 FindCSAElementByName()

```
bool gdcm::CSAHeader::FindCSAElementByName (
    const char * name )
```

Return true if the CSA element matching 'name' is found or not

#### Warning

Case Sensitive

#### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

### 10.66.4.2 GetCSADataInfo()

```
static const PrivateTag & gdcm::CSAHeader::GetCSADataInfo ( ) [static]
```

Return the private tag used by SIEMENS to store the CSA Data Info This is: [PrivateTag](#)(0x0029,0x10,"SIEMENS CSA NON-IMAGE");

### 10.66.4.3 GetCSAEEnd()

```
const CSAElement & gdcm::CSAHeader::GetCSAEEnd ( ) const [protected]
```

#### 10.66.4.4 GetCSAElementByName()

```
const CSAElement & gdcM::CSAHeader::GetCSAElementByName (
    const char * name )
```

Return the [CSAElement](#) corresponding to name 'name'

##### Warning

Case Sensitive

##### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

#### 10.66.4.5 GetCSAImageHeaderInfoTag()

```
static const PrivateTag & gdcM::CSAHeader::GetCSAImageHeaderInfoTag ( ) [static]
```

Return the private tag used by SIEMENS to store the CSA [Image](#) Header This is: [PrivateTag](#)(0x0029,0x10,"SIEMENS CSA HEADER");

##### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [PublicDict.cxx](#), and [csa2img.cxx](#).

#### 10.66.4.6 GetCSASeriesHeaderInfoTag()

```
static const PrivateTag & gdcM::CSAHeader::GetCSASeriesHeaderInfoTag ( ) [static]
```

Return the private tag used by SIEMENS to store the CSA [Series](#) Header This is: [PrivateTag](#)(0x0029,0x20,"SIEMENS CSA HEADER");

##### Examples

[MrProtocol.cxx](#).

#### 10.66.4.7 GetDataSet()

```
const DataSet & gdcm::CSAHeader::GetDataSet ( ) const [inline]
```

Return the [DataSet](#) output (use only if Format == DATASET\_FORMAT )

#### 10.66.4.8 GetFormat()

```
CSAHeaderType gdcm::CSAHeader::GetFormat ( ) const
```

return the format of the [CSAHeader](#) SV10 and NOMAGIC are equivalent.

#### 10.66.4.9 GetInterfile()

```
const char * gdcm::CSAHeader::GetInterfile ( ) const [inline]
```

Return the string output (use only if Format == Interfile)

#### 10.66.4.10 GetMrProtocol()

```
bool gdcm::CSAHeader::GetMrProtocol (
    const DataSet & ds,
    MrProtocol & mrProtocol )
```

Retrieve the ASCII portion stored within the MrProtocol/MrPhoenixProtocol:

##### Examples

[MrProtocol.cxx](#).

#### 10.66.4.11 LoadFromDataElement()

```
bool gdcm::CSAHeader::LoadFromDataElement (
    DataElement const & de )
```

Decode the [CSAHeader](#) from element 'de'.

##### Examples

[DumpCSA.cs](#), [DumpSiemensBase64.cxx](#), [MrProtocol.cxx](#), and [csa2img.cxx](#).

#### 10.66.4.12 Print()

```
void gdcM::CSAHeader::Print (
    std::ostream & os ) const
```

Print the [CSAHeader](#) (use only if Format == SV10 or NOMAGIC)

#### Examples

[csa2img.cxx](#).

### 10.66.5 Friends And Related Function Documentation

#### 10.66.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CSAHeader & d ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMCSAHeader.h](#)

## 10.67 gdcM::CSAHeaderDict Class Reference

Class to represent a map of [CSAHeaderDictEntry](#).

```
#include <gdcMCSAHeaderDict.h>
```

### Public Types

- typedef MapCSAHeaderDictEntry::const\_iterator [ConstIterator](#)
- typedef MapCSAHeaderDictEntry::iterator [Iterator](#)
- typedef std::set< [CSAHeaderDictEntry](#) > [MapCSAHeaderDictEntry](#)

### Public Member Functions

- [CSAHeaderDict](#) ()
- [CSAHeaderDict](#) (const [CSAHeaderDict](#) &\_val)=delete
- void [AddCSAHeaderDictEntry](#) (const [CSAHeaderDictEntry](#) &de)
- [ConstIterator](#) [Begin](#) () const
- [ConstIterator](#) [End](#) () const
- const [CSAHeaderDictEntry](#) & [GetCSAHeaderDictEntry](#) (const char \*name) const
- bool [IsEmpty](#) () const
- [CSAHeaderDict](#) & [operator=](#) (const [CSAHeaderDict](#) &\_val)=delete

## Protected Member Functions

- void [LoadDefault](#) ()

## Friends

- class [Dicts](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [CSAHeaderDict](#) &\_val)

### 10.67.1 Detailed Description

Class to represent a map of [CSAHeaderDictEntry](#).

Examples

[MrProtocol.cxx](#).

### 10.67.2 Member Typedef Documentation

#### 10.67.2.1 ConstIterator

```
typedef MapCSAHeaderDictEntry::const_iterator gdcm::CSAHeaderDict::ConstIterator
```

#### 10.67.2.2 Iterator

```
typedef MapCSAHeaderDictEntry::iterator gdcm::CSAHeaderDict::Iterator
```

#### 10.67.2.3 MapCSAHeaderDictEntry

```
typedef std::set<CSAHeaderDictEntry> gdcm::CSAHeaderDict::MapCSAHeaderDictEntry
```

### 10.67.3 Constructor & Destructor Documentation

### 10.67.3.1 CSAHeaderDict() [1/2]

```
gdcm::CSAHeaderDict::CSAHeaderDict ( ) [inline]
```

### 10.67.3.2 CSAHeaderDict() [2/2]

```
gdcm::CSAHeaderDict::CSAHeaderDict (
    const CSAHeaderDict & _val ) [delete]
```

## 10.67.4 Member Function Documentation

### 10.67.4.1 AddCSAHeaderDictEntry()

```
void gdcm::CSAHeaderDict::AddCSAHeaderDictEntry (
    const CSAHeaderDictEntry & de ) [inline]
```

### 10.67.4.2 Begin()

```
ConstIterator gdcm::CSAHeaderDict::Begin ( ) const [inline]
```

### 10.67.4.3 End()

```
ConstIterator gdcm::CSAHeaderDict::End ( ) const [inline]
```

### 10.67.4.4 GetCSAHeaderDictEntry()

```
const CSAHeaderDictEntry & gdcm::CSAHeaderDict::GetCSAHeaderDictEntry (
    const char * name ) const [inline]
```

### Examples

[MrProtocol.cxx](#).



#### 10.67.4.5 IsEmpty()

```
bool gdcm::CSAHeaderDict::IsEmpty ( ) const [inline]
```

#### 10.67.4.6 LoadDefault()

```
void gdcm::CSAHeaderDict::LoadDefault ( ) [protected]
```

#### 10.67.4.7 operator=()

```
CSAHeaderDict & gdcm::CSAHeaderDict::operator= (
    const CSAHeaderDict & _val ) [delete]
```

### 10.67.5 Friends And Related Function Documentation

#### 10.67.5.1 Dicts

```
friend class Dicts [friend]
```

#### 10.67.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CSAHeaderDict & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmCSAHeaderDict.h](#)

## 10.68 gdcm::CSAHeaderDictEntry Class Reference

Class to represent an Entry in the [Dict](#).

```
#include <gdcmCSAHeaderDictEntry.h>
```

## Public Member Functions

- [CSAHeaderDictEntry](#) (const char \*name="", [VR](#) const &vr=[VR::INVALID](#), [VM](#) const &vm=[VM::VM0](#), const char \*desc="")
- const char \* [GetDescription](#) () const  
*Set/Get Description.*
- const char \* [GetName](#) () const  
*Set/Get Name.*
- const [VM](#) & [GetVM](#) () const  
*Set/Get VM.*
- const [VR](#) & [GetVR](#) () const  
*Set/Get VR.*
- bool [operator<](#) (const [CSAHeaderDictEntry](#) &entry) const
- void [SetDescription](#) (const char \*desc)
- void [SetName](#) (const char \*name)
- void [SetVM](#) ([VM](#) const &vm)
- void [SetVR](#) (const [VR](#) &vr)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [CSAHeaderDictEntry](#) &\_val)

### 10.68.1 Detailed Description

Class to represent an Entry in the [Dict](#).

Does not really exist within the DICOM definition, just a way to minimize storage and have a mapping from [gdcm::Tag](#) to the needed information

#### Note

bla TODO FIXME: Need a PublicCSAHeaderDictEntry...indeed [CSAHeaderDictEntry](#) has a notion of retired which does not exist in PrivateCSAHeaderDictEntry...

#### See also

[gdcm::Dict](#)

#### Examples

[MrProtocol.cxx](#).

### 10.68.2 Constructor & Destructor Documentation

### 10.68.2.1 CSAHeaderDictEntry()

```
gdcm::CSAHeaderDictEntry::CSAHeaderDictEntry (
    const char * name = "",
    VR const & vr = VR::INVALID,
    VM const & vm = VM::VMO,
    const char * desc = "" ) [inline]
```

## 10.68.3 Member Function Documentation

### 10.68.3.1 GetDescription()

```
const char * gdcm::CSAHeaderDictEntry::GetDescription ( ) const [inline]
```

Set/Get Description.

### 10.68.3.2 GetName()

```
const char * gdcm::CSAHeaderDictEntry::GetName ( ) const [inline]
```

Set/Get Name.

Referenced by [operator<\(\)](#).

### 10.68.3.3 GetVM()

```
const VM & gdcm::CSAHeaderDictEntry::GetVM ( ) const [inline]
```

Set/Get VM.

### 10.68.3.4 GetVR()

```
const VR & gdcm::CSAHeaderDictEntry::GetVR ( ) const [inline]
```

Set/Get VR.

#### 10.68.3.5 operator<()

```
bool gdcm::CSAHeaderDictEntry::operator< (
    const CSAHeaderDictEntry & entry ) const [inline]
```

References [GetName\(\)](#).

#### 10.68.3.6 SetDescription()

```
void gdcm::CSAHeaderDictEntry::SetDescription (
    const char * desc ) [inline]
```

#### 10.68.3.7 SetName()

```
void gdcm::CSAHeaderDictEntry::SetName (
    const char * name ) [inline]
```

#### 10.68.3.8 SetVM()

```
void gdcm::CSAHeaderDictEntry::SetVM (
    VM const & vm ) [inline]
```

#### 10.68.3.9 SetVR()

```
void gdcm::CSAHeaderDictEntry::SetVR (
    const VR & vr ) [inline]
```

### 10.68.4 Friends And Related Function Documentation

#### 10.68.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const CSAHeaderDictEntry & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmCSAHeaderDictEntry.h](#)

## 10.69 gdcm::CSAHeaderDictException Class Reference

```
#include <gdcmCSAHeaderDict.h>
```

Inheritance diagram for gdcm::CSAHeaderDictException:

Collaboration diagram for gdcm::CSAHeaderDictException:

The documentation for this class was generated from the following file:

- [gdcmCSAHeaderDict.h](#)

## 10.70 gdcm::network::CStoreRQ Class Reference

[CStoreRQ.](#)

```
#include <gdcmCStoreMessages.h>
```

Inheritance diagram for gdcm::network::CStoreRQ:

Collaboration diagram for gdcm::network::CStoreRQ:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [File](#) &file, bool writeDataSet=true)

#### 10.70.1 Detailed Description

[CStoreRQ.](#)

this file defines the messages for the cecho action

## 10.70.2 Member Function Documentation

### 10.70.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::CStoreRQ::ConstructPDV (
    const ULConnection & inConnection,
    const File & file,
    bool writeDataSet = true )
```

The documentation for this class was generated from the following file:

- [gdcM CStoreMessages.h](#)

## 10.71 gdcM::network::CStoreRSP Class Reference

[CStoreRSP](#) this file defines the messages for the cecho action.

```
#include <gdcM CStoreMessages.h>
```

Inheritance diagram for gdcM::network::CStoreRSP:

Collaboration diagram for gdcM::network::CStoreRSP:

### Public Member Functions

- std::vector< [PresentationDataValue](#) > [ConstructPDV](#) (const [DataSet](#) \*inDataSet, const [BasePDU](#) \*inPC)

### 10.71.1 Detailed Description

[CStoreRSP](#) this file defines the messages for the cecho action.

### 10.71.2 Member Function Documentation

### 10.71.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::CStoreRSP::ConstructPDV (
    const DataSet * inDataSet,
    const BasePDU * inPC )
```

The documentation for this class was generated from the following file:

- [gdcmCStoreMessages.h](#)

## 10.72 gdcm::Curve Class Reference

[Curve](#) class to handle element 50xx,3000 [Curve](#) Data.

```
#include <gdcmCurve.h>
```

Inheritance diagram for gdcm::Curve:

Collaboration diagram for gdcm::Curve:

### Public Member Functions

- [Curve](#) ()
- [Curve](#) ([Curve](#) const &ov)
- [~Curve](#) () override
- void [Decode](#) (std::istream &is, std::ostream &os)
- void [GetAsPoints](#) (float \*array) const
- std::vector< unsigned short > const & [GetCurveDataDescriptor](#) () const
- unsigned short [GetDataValueRepresentation](#) () const
- unsigned short [GetDimensions](#) () const
- unsigned short [GetGroup](#) () const
- unsigned short [GetNumberOfPoints](#) () const
- const char \* [GetTypeOfData](#) () const
- const char \* [GetTypeOfDataDescription](#) () const
- bool [IsEmpty](#) () const
- void [Print](#) (std::ostream &) const override
- void [SetCoordinateStartValue](#) (unsigned short v)
- void [SetCoordinateStepValue](#) (unsigned short v)
- void [SetCurve](#) (const char \*array, unsigned int length)
- void [SetCurveDataDescriptor](#) (const uint16\_t \*values, size\_t num)
- void [SetCurveDescription](#) (const char \*curvedescription)
- void [SetDataValueRepresentation](#) (unsigned short datavaluerepresentation)
- void [SetDimensions](#) (unsigned short dimensions)
- void [SetGroup](#) (unsigned short group)
- void [SetNumberOfPoints](#) (unsigned short numberofpoints)
- void [SetTypeOfData](#) (const char \*typeofdata)
- void [Update](#) (const [DataElement](#) &de)

## Static Public Member Functions

- static unsigned int [GetNumberOfCurves](#) ([DataSet](#) const &ds)

## Additional Inherited Members

### 10.72.1 Detailed Description

[Curve](#) class to handle element 50xx,3000 [Curve](#) Data.

WARNING: This is deprecated and lastly defined in PS 3.3 - 2004

Examples:

- GE\_DLX-8-MONO2-Multiframe-Jpeg\_Lossless.dcm
- GE\_DLX-8-MONO2-Multiframe.dcm
- gdcmSampleData/Philips\_Medical\_Images/integris\_HV\_5000/xa\_integris.dcm
- TOSHIBA-CurveData[1-3].dcm

### 10.72.2 Constructor & Destructor Documentation

#### 10.72.2.1 [Curve\(\)](#) [1/2]

```
gdcm::Curve::Curve ( )
```

#### 10.72.2.2 [~Curve\(\)](#)

```
gdcm::Curve::~~Curve ( ) [override]
```

#### 10.72.2.3 [Curve\(\)](#) [2/2]

```
gdcm::Curve::Curve (
    Curve const & ov )
```



## 10.72.3 Member Function Documentation

### 10.72.3.1 Decode()

```
void gdcm::Curve::Decode (
    std::istream & is,
    std::ostream & os )
```

### 10.72.3.2 GetAsPoints()

```
void gdcm::Curve::GetAsPoints (
    float * array ) const
```

### 10.72.3.3 GetCurveDataDescriptor()

```
std::vector< unsigned short > const & gdcm::Curve::GetCurveDataDescriptor ( ) const
```

### 10.72.3.4 GetDataValueRepresentation()

```
unsigned short gdcm::Curve::GetDataValueRepresentation ( ) const
```

### 10.72.3.5 GetDimensions()

```
unsigned short gdcm::Curve::GetDimensions ( ) const
```

### 10.72.3.6 GetGroup()

```
unsigned short gdcm::Curve::GetGroup ( ) const
```

### 10.72.3.7 GetNumberOfCurves()

```
static unsigned int gdcm::Curve::GetNumberOfCurves (
    DataSet const & ds ) [static]
```

### 10.72.3.8 GetNumberOfPoints()

```
unsigned short gdcm::Curve::GetNumberOfPoints ( ) const
```

### 10.72.3.9 GetTypeInfoData()

```
const char * gdcm::Curve::GetTypeInfoData ( ) const
```

### 10.72.3.10 GetTypeInfoDataDescription()

```
const char * gdcm::Curve::GetTypeInfoDataDescription ( ) const
```

### 10.72.3.11 IsEmpty()

```
bool gdcm::Curve::IsEmpty ( ) const
```

### 10.72.3.12 Print()

```
void gdcm::Curve::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

**10.72.3.13 SetCoordinateStartValue()**

```
void gdcm::Curve::SetCoordinateStartValue (
    unsigned short v )
```

**10.72.3.14 SetCoordinateStepValue()**

```
void gdcm::Curve::SetCoordinateStepValue (
    unsigned short v )
```

**10.72.3.15 SetCurve()**

```
void gdcm::Curve::SetCurve (
    const char * array,
    unsigned int length )
```

**10.72.3.16 SetCurveDataDescriptor()**

```
void gdcm::Curve::SetCurveDataDescriptor (
    const uint16_t * values,
    size_t num )
```

**10.72.3.17 SetCurveDescription()**

```
void gdcm::Curve::SetCurveDescription (
    const char * curvedescription )
```

**10.72.3.18 SetDataValueRepresentation()**

```
void gdcm::Curve::SetDataValueRepresentation (
    unsigned short datavaluerepresentation )
```

### 10.72.3.19 SetDimensions()

```
void gdcM::Curve::SetDimensions (
    unsigned short dimensions )
```

### 10.72.3.20 SetGroup()

```
void gdcM::Curve::SetGroup (
    unsigned short group )
```

### 10.72.3.21 SetNumberOfPoints()

```
void gdcM::Curve::SetNumberOfPoints (
    unsigned short numberofpoints )
```

### 10.72.3.22 SetTypeOfData()

```
void gdcM::Curve::SetTypeOfData (
    const char * typeofdata )
```

### 10.72.3.23 Update()

```
void gdcM::Curve::Update (
    const DataElement & de )
```

The documentation for this class was generated from the following file:

- [gdcMCurve.h](#)

## 10.73 gdcM::DataElement Class Reference

Class to represent a Data [Element](#) either Implicit or Explicit.

```
#include <gdcMDataElement.h>
```

Inheritance diagram for gdcM::DataElement:

Collaboration diagram for gdcM::DataElement:

## Public Member Functions

- [DataElement](#) (const [DataElement](#) &\_val)
- [DataElement](#) (const [Tag](#) &t=[Tag](#)(0), const [VL](#) &vl=0, const [VR](#) &vr=[VR::INVALID](#))
- void [Clear](#) ()
  - Clear Data [Element](#) (make [Value](#) empty and invalidate [Tag](#) & [VR](#))*
- void [Empty](#) ()
  - Make Data [Element](#) empty (no [Value](#))*
- const [ByteValue](#) \* [GetByteValue](#) () const
- template<typename TDE >  
[VL](#) [GetLength](#) () const
- [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) ()
- const [SequenceOfFragments](#) \* [GetSequenceOfFragments](#) () const
- [Tag](#) & [GetTag](#) ()
- const [Tag](#) & [GetTag](#) () const
  - Get [Tag](#).*
- [Value](#) & [GetValue](#) ()
- [Value](#) const & [GetValue](#) () const
  - Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):*
- [SmartPointer](#)< [SequenceOfItems](#) > [GetValueAsSQ](#) () const
- [VL](#) & [GetVL](#) ()
- const [VL](#) & [GetVL](#) () const
  - Get [VL](#).*
- [VR](#) const & [GetVR](#) () const
- bool [IsEmpty](#) () const
  - Check if Data [Element](#) is empty.*
- bool [IsUndefinedLength](#) () const
  - return if [Value](#) Length if of undefined length*
- bool [operator<](#) (const [DataElement](#) &de) const
- [DataElement](#) & [operator=](#) (const [DataElement](#) &)=default
- bool [operator==](#) (const [DataElement](#) &de) const
- template<typename TDE , typename TSwap >  
[std::istream](#) & [Read](#) ([std::istream](#) &is)
- template<typename TDE , typename TSwap >  
[std::istream](#) & [ReadOrSkip](#) ([std::istream](#) &is, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE , typename TSwap >  
[std::istream](#) & [ReadPreValue](#) ([std::istream](#) &is, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE , typename TSwap >  
[std::istream](#) & [ReadValue](#) ([std::istream](#) &is, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE , typename TSwap >  
[std::istream](#) & [ReadValueWithLength](#) ([std::istream](#) &is, [VL](#) &length, [std::set](#)< [Tag](#) > const &skiptags)
- template<typename TDE , typename TSwap >  
[std::istream](#) & [ReadWithLength](#) ([std::istream](#) &is, [VL](#) &length)
- void [SetByteValue](#) (const char \*array, [VL](#) length)
- void [SetTag](#) (const [Tag](#) &t)
- void [SetValue](#) ([Value](#) const &vl)
- void [SetVL](#) (const [VL](#) &vl)
- void [SetVLToUndefined](#) ()
- void [SetVR](#) ([VR](#) const &vr)
- template<typename TDE , typename TSwap >  
const [std::ostream](#) & [Write](#) ([std::ostream](#) &os) const

## Protected Types

- typedef [SmartPointer](#)< [Value](#) > [ValuePtr](#)

## Protected Member Functions

- void [SetValueFieldLength](#) ([VL](#) vl, bool readvalues)

## Protected Attributes

- [Tag](#) TagField
- [ValuePtr](#) ValueField
- [VL](#) ValueLengthField
- [VR](#) VRField

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [DataElement](#) &\_val)

### 10.73.1 Detailed Description

Class to represent a Data [Element](#) either Implicit or Explicit.

DATA ELEMENT: A unit of information as defined by a single entry in the data dictionary. An encoded Information [Object](#) Definition (IOD) [Attribute](#) that is composed of, at a minimum, three fields: a Data [Element](#) [Tag](#), a [Value](#) Length, and a [Value](#) Field. For some specific Transfer Syntaxes, a Data [Element](#) also contains a [VR](#) Field where the [Value](#) Representation of that Data [Element](#) is specified explicitly.

Design:

- A [DataElement](#) in GDCM always store [VL](#) ([Value](#) Length) on a 32 bits integer even when [VL](#) is 16 bits
- A [DataElement](#) always store the [VR](#) even for Implicit TS, in which case [VR](#) is defaulted to [VR::INVALID](#)
- For [Item](#) start/end (See 0xfffe tags), [Value](#) is NULL

See also

[ExplicitDataElement](#) [ImplicitDataElement](#)

## Examples

[BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAIIVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [StreamImageReaderTest.cxx](#), [csa2img.cxx](#), [gdcmrionplan.cxx](#), [gdcmrtpplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 10.73.2 Member Typedef Documentation

### 10.73.2.1 ValuePtr

```
typedef SmartPointer<Value> gdcm::DataElement::ValuePtr [protected]
```

## 10.73.3 Constructor & Destructor Documentation

### 10.73.3.1 DataElement() [1/2]

```
gdcm::DataElement::DataElement (
    const Tag & t = Tag(0),
    const VL & vl = 0,
    const VR & vr = VR::INVALID ) [inline]
```

### 10.73.3.2 DataElement() [2/2]

```
gdcm::DataElement::DataElement (
    const DataElement & _val ) [inline]
```

## 10.73.4 Member Function Documentation

### 10.73.4.1 Clear()

```
void gdcm::DataElement::Clear ( ) [inline]
```

Clear Data Element (make Value empty and invalidate Tag & VR)

#### 10.73.4.2 Empty()

```
void gdcm::DataElement::Empty ( ) [inline]
```

Make Data [Element](#) empty (no [Value](#))

#### 10.73.4.3 GetByteValue()

```
const ByteValue * gdcm::DataElement::GetByteValue ( ) const [inline]
```

Return the [Value](#) of [DataElement](#) as a [ByteValue](#) (if possible)

##### Warning

: You need to check for NULL return value

##### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGSL.cxx](#), [GetSubSequenceData.cxx](#), [PatchFile.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), [gdcm::Element< TVR, TVM >::SetFromDataElement\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

#### 10.73.4.4 GetLength()

```
template<typename TDE >  
VL gdcm::DataElement::GetLength ( ) const [inline]
```

#### 10.73.4.5 GetSequenceOfFragments() [1/2]

```
SequenceOfFragments * gdcm::DataElement::GetSequenceOfFragments ( )
```



#### 10.73.4.6 GetSequenceOfFragments() [2/2]

```
const SequenceOfFragments * gdcm::DataElement::GetSequenceOfFragments ( ) const
```

Return the [Value](#) of [DataElement](#) as a Sequence Of Fragments (if possible)

##### Warning

: You need to check for NULL return value

##### Examples

[DecompressImage.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), and [GetJPEGSamplePrecision.cxx](#).

#### 10.73.4.7 GetTag() [1/2]

```
Tag & gdcm::DataElement::GetTag ( ) [inline]
```

#### 10.73.4.8 GetTag() [2/2]

```
const Tag & gdcm::DataElement::GetTag ( ) const [inline]
```

Get [Tag](#).

##### Examples

[DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [SimplePrint.cs](#), and [pmsct\\_rgb1.cxx](#).

Referenced by [gdcm::DataSet::Insert\(\)](#), [gdcm::FileMetaInformation::Insert\(\)](#), [gdcm::CommandDataSet::Insert\(\)](#), [operator<\(\)](#), [gdcm::SequenceOfItems::Read\(\)](#), [gdcm::SequenceOfFragments::ReadValue\(\)](#), [gdcm::FileMetaInformation::Replace\(\)](#), [gdcm::CommandDataSet::Replace\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)

#### 10.73.4.9 GetValue() [1/2]

```
Value & gdcm::DataElement::GetValue ( ) [inline]
```

References [gdcmAssertAlwaysMacro](#).

**10.73.4.10 GetValue() [2/2]**

```
Value const & gdcm::DataElement::GetValue ( ) const [inline]
```

Set/Get [Value](#) (bytes array, SQ of items, SQ of fragments):

**Examples**

[ReadAndDumpDICOMDIR.cxx](#).

References [gdcmAssertAlwaysMacro](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::Element< TVR, TVM >::SetFromDataElement\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

**10.73.4.11 GetValueAsSQ()**

```
SmartPointer< SequenceOfItems > gdcm::DataElement::GetValueAsSQ ( ) const
```

Interpret the [Value](#) stored in the [DataElement](#). This is more robust (but also more expensive) to call this function rather than the simplest form: [GetSequenceOfItems\(\)](#) It also return NULL when the [Value](#) is NOT of type [SequenceOfItems](#)

**Warning**

in case [GetSequenceOfItems\(\)](#) succeed the function return this value, otherwise it creates a new [SequenceOfItems](#), you should handle that in your case, for instance: `SmartPointer<SequenceOfItems> sqi = de.GetValueAsSQ();`

**Examples**

[ChangeSequenceUltrasound.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ExtractEncryptedContent.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [SimplePrint.cs](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

**10.73.4.12 GetVL() [1/2]**

```
VL & gdcm::DataElement::GetVL ( ) [inline]
```

**10.73.4.13 GetVL()** [2/2]

```
const VL & gdcm::DataElement::GetVL ( ) const [inline]
```

Get [VL](#).

**Examples**

[SimplePrint.cs](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::SequenceOfItems::Read\(\)](#), and [gdcm::SequenceOfFragments::ReadValue\(\)](#).

**10.73.4.14 GetVR()**

```
VR const & gdcm::DataElement::GetVR ( ) const [inline]
```

Get [VR](#) do not set [VR::SQ](#) on bytevalue data element

**Examples**

[DuplicatePCDE.cxx](#), and [GenFakeIdentifyFile.cxx](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcm::Element< TVR, TVM >::GetAsDataElement\(\)](#), [gdcm::Element< TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#), [gdcm::Element< TVR, TVM >::SetFromDataElement\(\)](#), and [gdcm::Element< TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

**10.73.4.15 IsEmpty()**

```
bool gdcm::DataElement::IsEmpty ( ) const [inline]
```

Check if Data [Element](#) is empty.

**Examples**

[DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [ELSCINT1WaveToText.cxx](#), [FixJAIBugJPEGLS.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::DataSet::InsertDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataElement\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataElement\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataElement\(\)](#).

#### 10.73.4.16 IsUndefinedLength()

```
bool gdcm::DataElement::IsUndefinedLength ( ) const [inline]
```

return if [Value](#) Length if of undefined length

#### 10.73.4.17 operator<()

```
bool gdcm::DataElement::operator< (
    const DataElement & de ) const [inline]
```

References [GetTag\(\)](#).

#### 10.73.4.18 operator=()

```
DataElement & gdcm::DataElement::operator= (
    const DataElement & ) [default]
```

#### 10.73.4.19 operator==()

```
bool gdcm::DataElement::operator== (
    const DataElement & de ) const [inline]
```

References [TagField](#), [ValueField](#), [ValueLengthField](#), and [VRField](#).

#### 10.73.4.20 Read()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataElement::Read (
    std::istream & is ) [inline]
```

#### Examples

[DumpSiemensBase64.cxx](#).

#### 10.73.4.21 ReadOrSkip()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataElement::ReadOrSkip (
    std::istream & is,
    std::set< Tag > const & skiptags ) [inline]
```

#### 10.73.4.22 ReadPreValue()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataElement::ReadPreValue (
    std::istream & is,
    std::set< Tag > const & skiptags ) [inline]
```

#### 10.73.4.23 ReadValue()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataElement::ReadValue (
    std::istream & is,
    std::set< Tag > const & skiptags ) [inline]
```

#### 10.73.4.24 ReadValueWithLength()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataElement::ReadValueWithLength (
    std::istream & is,
    VL & length,
    std::set< Tag > const & skiptags ) [inline]
```

#### 10.73.4.25 ReadWithLength()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataElement::ReadWithLength (
    std::istream & is,
    VL & length ) [inline]
```

#### 10.73.4.26 SetByteValue()

```
void gdcM::DataElement::SetByteValue (
    const char * array,
    VL length ) [inline]
```

Set the byte value

##### Warning

user need to read DICOM standard for an understanding of:

- even padding
- \0 vs space padding By default even padding is achieved using \0 regardless of the of [VR](#)

##### Examples

[BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [StreamImageReaderTest.cxx](#), [iU22tomultisc.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcM::Attribute< Group, Element, TVR, TVM >::GetAsDataElement\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcM::Element< TVR, TVM >::GetAsDataElement\(\)](#), and [gdcM::Element< TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#).

#### 10.73.4.27 SetTag()

```
void gdcM::DataElement::SetTag (
    const Tag & t ) [inline]
```

Set [Tag](#) Use with cautious (need to match Part 6)

##### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenFakeIdentifyFile.cxx](#), and [GetSubSequenceData.cxx](#).

#### 10.73.4.28 SetValue()

```
void gdcm::DataElement::SetValue (
    Value const & vl ) [inline]
```

##### Warning

you need to set the ValueLengthField explicitly

##### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [DuplicatePCDE.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixBrokenJ2K.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [MpegVideoInfo.cs](#), and [NewSequence.cs](#).

References [gdcm::Value::GetLength\(\)](#).

#### 10.73.4.29 SetValueFieldLength()

```
void gdcm::DataElement::SetValueFieldLength (
    VL vl,
    bool readvalues ) [protected]
```

#### 10.73.4.30 SetVL()

```
void gdcm::DataElement::SetVL (
    const VL & vl ) [inline]
```

Set [VL](#) Use with cautious (need to match Part 6), advanced user only

##### See also

[SetByteValue](#)

#### 10.73.4.31 SetVLToUndefined()

```
void gdcm::DataElement::SetVLToUndefined ( )
```

##### Examples

[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), and [NewSequence.cs](#).

### 10.73.4.32 SetVR()

```
void gdcmm::DataElement::SetVR (
    VR const & vr ) [inline]
```

Set [VR](#) Use with cautious (need to match Part 6), advanced user only

#### Precondition

vr is a [VR::VRALL](#) (not a dual one such as OB\_OW)

#### Examples

[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSubSequenceData.cxx](#), [NewSequence.cs](#), [StreamImageReaderTest.cxx](#), [iU22tomultisc.cxx](#), and [rle2img.cxx](#).

References [gdcmm::VR::IsVRFile\(\)](#).

Referenced by [gdcmm::Attribute< Group, Element, TVR, TVM >::GetAsDataElement\(\)](#), [gdcmm::Attribute< Group, Element, TVR, VM::VM1 >::GetAsDataElement\(\)](#), [gdcmm::Attribute< Group, Element, TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#), [gdcmm::Element< TVR, TVM >::GetAsDataElement\(\)](#), and [gdcmm::Element< TVR, VM::VM1\\_n >::GetAsDataElement\(\)](#).

### 10.73.4.33 Write()

```
template<typename TDE , typename TSwap >
const std::ostream & gdcmm::DataElement::Write (
    std::ostream & os ) const [inline]
```

## 10.73.5 Friends And Related Function Documentation

### 10.73.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DataElement & _val ) [friend]
```

### 10.73.6 Member Data Documentation



### 10.73.6.1 TagField

`Tag` `gdcm::DataElement::TagField` [protected]

Referenced by `operator==()`.

### 10.73.6.2 ValueField

`ValuePtr` `gdcm::DataElement::ValueField` [protected]

Referenced by `operator==()`.

### 10.73.6.3 ValueLengthField

`VL` `gdcm::DataElement::ValueLengthField` [protected]

Referenced by `operator==()`.

### 10.73.6.4 VRField

`VR` `gdcm::DataElement::VRField` [protected]

Referenced by `operator==()`.

The documentation for this class was generated from the following file:

- [gdcmDataElement.h](#)

## 10.74 gdcm::DataElementException Class Reference

```
#include <gdcmDataSet.h>
```

Inheritance diagram for `gdcm::DataElementException`:

Collaboration diagram for `gdcm::DataElementException`:

The documentation for this class was generated from the following file:

- [gdcmDataSet.h](#)

## 10.75 gdcm::DataEvent Class Reference

[DataEvent](#).

```
#include <gdcmDataEvent.h>
```

Inheritance diagram for gdcm::DataEvent:

Collaboration diagram for gdcm::DataEvent:

### Public Types

- typedef [DataEvent](#) [Self](#)
- typedef [AnyEvent](#) [Superclass](#)

### Public Member Functions

- [DataEvent](#) (const char \*bytes=nullptr, size\_t len=0)
- [DataEvent](#) (const [Self](#) &s)
- [~DataEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcm::Event](#) \*e) const override
- const char \* [GetData](#) () const
- size\_t [GetDataLength](#) () const
- const char \* [GetEventName](#) () const override
- [::gdcm::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetData](#) (const char \*bytes, size\_t len)

### 10.75.1 Detailed Description

[DataEvent](#).

### 10.75.2 Member Typedef Documentation

#### 10.75.2.1 Self

```
typedef DataEvent gdcm::DataEvent::Self
```

### 10.75.2.2 Superclass

```
typedef AnyEvent gdcm::DataEvent::Superclass
```

## 10.75.3 Constructor & Destructor Documentation

### 10.75.3.1 DataEvent() [1/2]

```
gdcm::DataEvent::DataEvent (
    const char * bytes = nullptr,
    size_t len = 0 ) [inline]
```

### 10.75.3.2 ~DataEvent()

```
gdcm::DataEvent::~DataEvent ( ) [override], [default]
```

### 10.75.3.3 DataEvent() [2/2]

```
gdcm::DataEvent::DataEvent (
    const Self & s ) [inline]
```

## 10.75.4 Member Function Documentation

### 10.75.4.1 CheckEvent()

```
bool gdcm::DataEvent::CheckEvent (
    const ::gdcm::Event * e ) const [inline], [override]
```

### 10.75.4.2 GetData()

```
const char * gdcm::DataEvent::GetData ( ) const [inline]
```

#### 10.75.4.3 GetDataLength()

```
size_t gdcM::DataEvent::GetDataLength ( ) const [inline]
```

#### 10.75.4.4 GetEventName()

```
const char * gdcM::DataEvent::GetEventName ( ) const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcM::Event](#).

#### 10.75.4.5 MakeObject()

```
::gdcM::Event * gdcM::DataEvent::MakeObject ( ) const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcM::Event](#).

#### 10.75.4.6 operator=()

```
void gdcM::DataEvent::operator= (
    const Self & ) [delete]
```

#### 10.75.4.7 SetData()

```
void gdcM::DataEvent::SetData (
    const char * bytes,
    size_t len ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcMDataEvent.h](#)

## 10.76 gdcm::DataSet Class Reference

Class to represent a Data Set (which contains Data Elements)

```
#include <gdcmDataSet.h>
```

Inheritance diagram for gdcm::DataSet:

### Public Types

- typedef DataSet::const\_iterator [ConstIterator](#)
- typedef std::set< [DataElement](#) > [DataSet](#)
- typedef DataSet::iterator [Iterator](#)
- typedef DataSet::size\_type [SizeType](#)

### Public Member Functions

- [Iterator](#) [Begin](#) ()
- [ConstIterator](#) [Begin](#) () const
- void [Clear](#) ()
- template<typename TDE >  
unsigned int [ComputeGroupLength](#) ([Tag](#) const &tag) const
- [Iterator](#) [End](#) ()
- [ConstIterator](#) [End](#) () const
- bool [FindDataElement](#) (const [PrivateTag](#) &t) const  
*Look up if private tag 't' is present in the dataset:*
- bool [FindDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [FindNextDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [GetDataElement](#) (const [PrivateTag](#) &t) const  
*Return the dataelement.*
- const [DataElement](#) & [GetDataElement](#) (const [Tag](#) &t) const
- [DataSet](#) & [GetDES](#) ()
- const [DataSet](#) & [GetDES](#) () const
- template<typename TDE >  
[VL](#) [GetLength](#) () const
- [MediaStorage](#) [GetMediaStorage](#) () const
- std::string [GetPrivateCreator](#) (const [Tag](#) &t) const
- [PrivateTag](#) [GetPrivateTag](#) (const [Tag](#) &t) const  
*Return the private tag of the private tag 't', private creator will be set to empty if not found.*
- void [Insert](#) (const [DataElement](#) &de)
- bool [IsEmpty](#) () const  
*Returns if the dataset is empty.*
- const [DataElement](#) & [operator](#)() (uint16\_t group, uint16\_t element) const
- [DataSet](#) & [operator=](#) ([DataSet](#) const &)=default
- const [DataElement](#) & [operator](#)[] (const [Tag](#) &t) const
- void [Print](#) (std::ostream &os, std::string const &indent="") const
- template<typename TDE, typename TSwap >  
std::istream & [Read](#) (std::istream &is)

- `template<typename TDE , typename TSwap >`  
`std::istream & ReadNested (std::istream &is)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadSelectedPrivateTags (std::istream &is, const std::set< PrivateTag > &tags, bool readvalues=true)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadSelectedPrivateTagsWithLength (std::istream &is, const std::set< PrivateTag > &tags, VL &length, bool readvalues=true)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadSelectedTags (std::istream &is, const std::set< Tag > &tags, bool readvalues=true)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadSelectedTagsWithLength (std::istream &is, const std::set< Tag > &tags, VL &length, bool readvalues=true)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadUpToTag (std::istream &is, const Tag &t, std::set< Tag > const &skiptags)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadUpToTagWithLength (std::istream &is, const Tag &t, std::set< Tag > const &skiptags, VL &length)`
- `template<typename TDE , typename TSwap >`  
`std::istream & ReadWithLength (std::istream &is, VL &length)`
- `SizeType Remove (const Tag &tag)`  
*Completely remove a dataelement from the dataset.*
- `void Replace (const DataElement &de)`  
*Replace a dataelement with another one.*
- `void ReplaceEmpty (const DataElement &de)`  
*Only replace a DICOM attribute when it is missing or empty.*
- `SizeType Size () const`
- `template<typename TDE , typename TSwap >`  
`std::ostream const & Write (std::ostream &os) const`

## Protected Member Functions

- `Tag ComputeDataElement (const PrivateTag &t) const`
- `const DataElement & GetDEEnd () const`
- `void InsertDataElement (const DataElement &de)`

## Friends

- class [CSAHeader](#)
- `std::ostream & operator<< (std::ostream &_os, const DataSet &)`

### 10.76.1 Detailed Description

Class to represent a Data Set (which contains Data Elements)

A Data Set represents an instance of a real world Information [Object](#)

**Note**

DATA SET: Exchanged information consisting of a structured set of [Attribute](#) values directly or indirectly related to Information Objects. The value of each [Attribute](#) in a Data Set is expressed as a Data [Element](#). A collection of Data Elements ordered by increasing Data [Element Tag](#) number that is an encoding of the values of Attributes of a real world object.

Implementation note. If one do: [DataSet](#) ds; ds.SetLength(0); ds.Read(is); setting length to 0 actually means try to read is as if it was a root [DataSet](#). Other value are undefined (nested dataset with undefined length) or defined length (different from 0) means nested dataset with defined length.

**Warning**

a [DataSet](#) does not have a Transfer Syntax type, only a [File](#) does.

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Write.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSEExplicit.cxx](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [SortImage.cxx](#), [SortImage2.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [VolumeSorter.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

**10.76.2 Member Typedef Documentation****10.76.2.1 ConstIterator**

```
typedef DataElementSet::const_iterator gdcm::DataSet::ConstIterator
```

**10.76.2.2 DataElementSet**

```
typedef std::set<DataElement> gdcm::DataSet::DataElementSet
```

### 10.76.2.3 Iterator

```
typedef DataSet::iterator gdc::DataSet::Iterator
```

### 10.76.2.4 SizeType

```
typedef DataSet::size_type gdc::DataSet::SizeType
```

## 10.76.3 Member Function Documentation

### 10.76.3.1 Begin() [1/2]

```
Iterator gdc::DataSet::Begin ( ) [inline]
```

### 10.76.3.2 Begin() [2/2]

```
ConstIterator gdc::DataSet::Begin ( ) const [inline]
```

#### Examples

[DiffFile.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), and [DuplicatePCDE.cxx](#).

### 10.76.3.3 Clear()

```
void gdc::DataSet::Clear ( ) [inline]
```

Referenced by [gdc::Item::Read\(\)](#).

### 10.76.3.4 ComputeDataElement()

```
Tag gdc::DataSet::ComputeDataElement (
    const PrivateTag & t ) const [protected]
```



### 10.76.3.5 ComputeGroupLength()

```
template<typename TDE >
unsigned int gdcm::DataSet::ComputeGroupLength (
    Tag const & tag ) const [inline]
```

References [gdcm::Tag::GetElement\(\)](#), and [gdcm::Tag::GetGroup\(\)](#).

### 10.76.3.6 End() [1/2]

```
Iterator gdcm::DataSet::End ( ) [inline]
```

### 10.76.3.7 End() [2/2]

```
ConstIterator gdcm::DataSet::End ( ) const [inline]
```

#### Examples

[DiffFile.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpVisusChange.cxx](#), and [DuplicatePCDE.cxx](#).

### 10.76.3.8 FindDataElement() [1/2]

```
bool gdcm::DataSet::FindDataElement (
    const PrivateTag & t ) const
```

Look up if private tag 't' is present in the dataset:

#### Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MrProtocol.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadGEMSSDO.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcm::Attribute< Group, Element, TVR, TVM >::SetFromDataSet\(\)](#), [gdcm::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet\(\)](#), and [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataSet\(\)](#).

**10.76.3.9 FindDataElement()** [2/2]

```
bool gdcM::DataSet::FindDataElement (
    const Tag & t ) const [inline]
```

**10.76.3.10 FindNextDataElement()**

```
const DataElement & gdcM::DataSet::FindNextDataElement (
    const Tag & t ) const [inline]
```

**Examples**

[DuplicatePCDE.cxx](#).

**10.76.3.11 GetDataElement()** [1/2]

```
const DataElement & gdcM::DataSet::GetDataElement (
    const PrivateTag & t ) const
```

Return the dataelement.

**10.76.3.12 GetDataElement()** [2/2]

```
const DataElement & gdcM::DataSet::GetDataElement (
    const Tag & t ) const [inline]
```

Return the [DataElement](#) with [Tag](#) 't'

**Warning**

: This only search at the 'root level' of the [DataSet](#)

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [ReadAndDumpDICOmdir.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [csa2img.cxx](#), [gdcMrtionplan.cxx](#), [gdcMrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

Referenced by [gdcM::Attribute< Group, Element, TVR, TVM >::Set\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1 >::Set\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >::Set\(\)](#), [gdcM::Attribute< Group, Element, TVR, TVM >::SetFromDataSet\(\)](#), [gdcM::Attribute< Group, Element, TVR, VM::VM1 >::SetFromDataSet\(\)](#), and [gdcM::Attribute< Group, Element, TVR, VM::VM1\\_n >::SetFromDataSet\(\)](#).

### 10.76.3.13 GetDEEnd()

```
const DataElement & gdcm::DataSet::GetDEEnd ( ) const [protected]
```

### 10.76.3.14 GetDES() [1/2]

```
DataElementSet & gdcm::DataSet::GetDES ( ) [inline]
```

### 10.76.3.15 GetDES() [2/2]

```
const DataElementSet & gdcm::DataSet::GetDES ( ) const [inline]
```

#### Examples

[ReadAndDumpDICOMDIR.cxx](#).

### 10.76.3.16 GetLength()

```
template<typename TDE >  
VL gdcm::DataSet::GetLength ( ) const [inline]
```

References [gdcm::VL::GetLength\(\)](#).

### 10.76.3.17 GetMediaStorage()

```
MediaStorage gdcm::DataSet::GetMediaStorage ( ) const
```

### 10.76.3.18 GetPrivateCreator()

```
std::string gdcm::DataSet::GetPrivateCreator (   
    const Tag & t ) const
```

Return the private creator of the private tag 't': or an empty string when not found

#### Examples

[DuplicatePCDE.cxx](#).

**10.76.3.19 GetPrivateTag()**

```
PrivateTag gdcM::DataSet::GetPrivateTag (
    const Tag & t ) const
```

Return the private tag of the private tag 't', private creator will be set to empty if not found.

**10.76.3.20 Insert()**

```
void gdcM::DataSet::Insert (
    const DataElement & de ) [inline]
```

Insert a [DataElement](#) in the [DataSet](#).

**Warning**

: [Tag](#) need to be  $\geq 0x8$  to be considered valid data element

**Examples**

[CreateJPIPDataSet.cxx](#), [DumpSiemensBase64.cxx](#), [DuplicatePCDE.cxx](#), [Extracting\\_All\\_Resolution.cxx](#),  
[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GenAllVR.cxx](#),  
[GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [NewSequence.cs](#), [StreamImageReaderTest.cxx](#),  
and [TemplateEmptyImage.cxx](#).

References [gdcMErrorMacro](#), [gdcM::Tag::GetGroup\(\)](#), and [gdcM::DataElement::GetTag\(\)](#).

**10.76.3.21 InsertDataElement()**

```
void gdcM::DataSet::InsertDataElement (
    const DataElement & de ) [inline], [protected]
```

References [gdcMWarningMacro](#), [gdcM::Value::GetLength\(\)](#), [gdcM::DataElement::GetValue\(\)](#), [gdcM::DataElement::GetVL\(\)](#),  
and [gdcM::DataElement::IsEmpty\(\)](#).

**10.76.3.22 IsEmpty()**

```
bool gdcM::DataSet::IsEmpty ( ) const [inline]
```

Returns if the dataset is empty.

Referenced by [gdcM::Item::Read\(\)](#).

### 10.76.3.23 operator>()()

```
const DataElement & gdcm::DataSet::operator() (
    uint16_t group,
    uint16_t element ) const [inline]
```

### 10.76.3.24 operator=()

```
DataSet & gdcm::DataSet::operator= (
    DataSet const & ) [default]
```

### 10.76.3.25 operator[]()

```
const DataElement & gdcm::DataSet::operator[] (
    const Tag & t ) const [inline]
```

### 10.76.3.26 Print()

```
void gdcm::DataSet::Print (
    std::ostream & os,
    std::string const & indent = "" ) const [inline]
```

### 10.76.3.27 Read()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataSet::Read (
    std::istream & is )
```

### Examples

[DumpToshibaDTI.cxx](#), and [DumpToshibaDTI2.cxx](#).

### 10.76.3.28 ReadNested()

```
template<typename TDE , typename TSwap >
std::istream & gdcM::DataSet::ReadNested (
    std::istream & is )
```

### 10.76.3.29 ReadSelectedPrivateTags()

```
template<typename TDE , typename TSwap >
std::istream & gdcM::DataSet::ReadSelectedPrivateTags (
    std::istream & is,
    const std::set< PrivateTag > & tags,
    bool readvalues = true )
```

### 10.76.3.30 ReadSelectedPrivateTagsWithLength()

```
template<typename TDE , typename TSwap >
std::istream & gdcM::DataSet::ReadSelectedPrivateTagsWithLength (
    std::istream & is,
    const std::set< PrivateTag > & tags,
    VL & length,
    bool readvalues = true )
```

### 10.76.3.31 ReadSelectedTags()

```
template<typename TDE , typename TSwap >
std::istream & gdcM::DataSet::ReadSelectedTags (
    std::istream & is,
    const std::set< Tag > & tags,
    bool readvalues = true )
```

### 10.76.3.32 ReadSelectedTagsWithLength()

```
template<typename TDE , typename TSwap >
std::istream & gdcM::DataSet::ReadSelectedTagsWithLength (
    std::istream & is,
    const std::set< Tag > & tags,
    VL & length,
    bool readvalues = true )
```

### 10.76.3.33 ReadUpToTag()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataSet::ReadUpToTag (
    std::istream & is,
    const Tag & t,
    std::set< Tag > const & skiptags )
```

### 10.76.3.34 ReadUpToTagWithLength()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataSet::ReadUpToTagWithLength (
    std::istream & is,
    const Tag & t,
    std::set< Tag > const & skiptags,
    VL & length )
```

### 10.76.3.35 ReadWithLength()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::DataSet::ReadWithLength (
    std::istream & is,
    VL & length )
```

### 10.76.3.36 Remove()

```
SizeType gdcm::DataSet::Remove (
    const Tag & tag ) [inline]
```

Completely remove a dataelement from the dataset.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [GenFakeIdentifyFile.cxx](#), [LargeVRDSExplicit.cxx](#), [MergeTwoFiles.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.76.3.37 Replace()

```
void gdcM::DataSet::Replace (
    const DataElement & de ) [inline]
```

Replace a dataelement with another one.

#### Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CreateFakeRTDOSE.cxx](#), [DeriveSeries.cxx](#),  
[FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetSubSequenceData.cxx](#),  
[HelloWorld.cxx](#), [LargeVRDSEExplicit.cxx](#), [PatchFile.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

References [gdcMAssertAlwaysMacro](#).

### 10.76.3.38 ReplaceEmpty()

```
void gdcM::DataSet::ReplaceEmpty (
    const DataElement & de ) [inline]
```

Only replace a DICOM attribute when it is missing or empty.

#### Examples

[rle2img.cxx](#).

References [gdcMAssertAlwaysMacro](#).

### 10.76.3.39 Size()

```
SizeType gdcM::DataSet::Size ( ) const [inline]
```

#### Examples

[DumpGEMSMovieGroup.cxx](#).

Referenced by [gdcM::SequenceOfItems::Read\(\)](#).



### 10.76.3.40 Write()

```
template<typename TDE , typename TSwap >
std::ostream const & gdcm::DataSet::Write (
    std::ostream & os ) const
```

## 10.76.4 Friends And Related Function Documentation

### 10.76.4.1 CSAHeader

```
friend class CSAHeader [friend]
```

### 10.76.4.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DataSet & val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmDataSet.h](#)

## 10.77 gdcm::DataSetEvent Class Reference

[DataSetEvent](#).

```
#include <gdcmDataSetEvent.h>
```

Inheritance diagram for gdcm::DataSetEvent:

Collaboration diagram for gdcm::DataSetEvent:

### Public Types

- typedef [DataSetEvent](#) Self
- typedef [AnyEvent](#) Superclass

## Public Member Functions

- [DataSetEvent](#) (const [Self](#) &s)
- [DataSetEvent](#) ([DataSet](#) const \*ds=nullptr)
- [~DataSetEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcmm::Event](#) \*e) const override
- [DataSet](#) const & [GetDataSet](#) () const
- const char \* [GetEventName](#) () const override
- [::gdcmm::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete

## Public Attributes

- const [DataSet](#) \* [m\\_DataSet](#)

### 10.77.1 Detailed Description

[DataSetEvent](#).

Special type of event triggered during the [DataSet](#) store/move process

See also

### 10.77.2 Member Typedef Documentation

#### 10.77.2.1 Self

```
typedef DataSetEvent gdcmm::DataSetEvent::Self
```

#### 10.77.2.2 Superclass

```
typedef AnyEvent gdcmm::DataSetEvent::Superclass
```

### 10.77.3 Constructor & Destructor Documentation

### 10.77.3.1 DataSetEvent() [1/2]

```
gdcm::DataSetEvent::DataSetEvent (
    DataSet const * ds = nullptr ) [inline]
```

### 10.77.3.2 ~DataSetEvent()

```
gdcm::DataSetEvent::~~DataSetEvent ( ) [override], [default]
```

### 10.77.3.3 DataSetEvent() [2/2]

```
gdcm::DataSetEvent::DataSetEvent (
    const Self & s ) [inline]
```

## 10.77.4 Member Function Documentation

### 10.77.4.1 CheckEvent()

```
bool gdcm::DataSetEvent::CheckEvent (
    const ::gdcm::Event * e ) const [inline], [override]
```

### 10.77.4.2 GetDataSet()

```
DataSet const & gdcm::DataSetEvent::GetDataSet ( ) const [inline]
```

References [m\\_DataSet](#).

### 10.77.4.3 GetEventName()

```
const char * gdcm::DataSetEvent::GetEventName ( ) const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

#### 10.77.4.4 MakeObject()

```
::gdcm::Event * gdcm::DataSetEvent::MakeObject ( ) const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

#### 10.77.4.5 operator=()

```
void gdcm::DataSetEvent::operator= (
    const Self & ) [delete]
```

### 10.77.5 Member Data Documentation

#### 10.77.5.1 m\_DataSet

```
const DataSet* gdcm::DataSetEvent::m_DataSet
```

Referenced by [GetDataSet\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmDataSetEvent.h](#)

## 10.78 gdcm::DataSetHelper Class Reference

[DataSetHelper](#) (internal class, not intended for user level)

```
#include <gdcmDataSetHelper.h>
```

### Static Public Member Functions

- static [VR ComputeVR](#) ([File](#) const &file, [DataSet](#) const &ds, const [Tag](#) &tag)

## 10.78.1 Detailed Description

[DataSetHelper](#) (internal class, not intended for user level)

Examples

[SimplePrint.cs](#).

## 10.78.2 Member Function Documentation

### 10.78.2.1 ComputeVR()

```
static VR gdcm::DataSetHelper::ComputeVR (
    File const & file,
    DataSet const & ds,
    const Tag & tag ) [static]
```

ds -> current dataset, which is not the same as the root dataset return [VR::INVALID](#) in case of error

Examples

[SimplePrint.cs](#).

The documentation for this class was generated from the following file:

- [gdcmDataSetHelper.h](#)

## 10.79 gdcm::Decoder Class Reference

[Decoder](#).

```
#include <gdcmDecoder.h>
```

Inheritance diagram for [gdcm::Decoder](#):

### Public Member Functions

- virtual [~Decoder](#) ()=default
- virtual bool [CanDecode](#) ([TransferSyntax](#) const &) const =0  
*Return whether this decoder support this transfer syntax (can decode it)*
- virtual bool [Decode](#) ([DataElement](#) const &, [DataElement](#) &)  
*Decode.*

## Protected Member Functions

- virtual bool [DecodeByStreams](#) (std::istream &, std::ostream &)

### 10.79.1 Detailed Description

[Decoder](#).

### 10.79.2 Constructor & Destructor Documentation

#### 10.79.2.1 ~Decoder()

```
virtual gdcm::Decoder::~~Decoder ( ) [virtual], [default]
```

### 10.79.3 Member Function Documentation

#### 10.79.3.1 CanDecode()

```
virtual bool gdcm::Decoder::CanDecode (
    TransferSyntax const & ) const [pure virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implemented in [gdcm::AudioCodec](#), [gdcm::ImageCodec](#), [gdcm::PDFCodec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 10.79.3.2 Decode()

```
virtual bool gdcm::Decoder::Decode (
    DataElement const & ,
    DataElement & ) [inline], [virtual]
```

Decode.

Reimplemented in [gdcm::DeltaEncodingCodec](#), [gdcm::AudioCodec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PDFCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), [gdcm::RLECodec](#), and [gdcm::ImageCodec](#).

### 10.79.3.3 DecodeByStreams()

```
virtual bool gdcm::Decoder::DecodeByStreams (
    std::istream & ,
    std::ostream & ) [inline], [protected], [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEG8Codec](#), [gdcm::JPEGCodec](#), [gdcm::RAWCodec](#), [gdcm::RLECodec](#), and [gdcm::ImageCodec](#).

The documentation for this class was generated from the following file:

- [gdcmDecoder.h](#)

## 10.80 gdcm::DefinedTerms Class Reference

Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.

```
#include <gdcmDefinedTerms.h>
```

### Public Member Functions

- [DefinedTerms](#) ()=default

### 10.80.1 Detailed Description

Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.

### 10.80.2 Constructor & Destructor Documentation

### 10.80.2.1 DefinedTerms()

```
gdcm::DefinedTerms::DefinedTerms ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmDefinedTerms.h](#)

## 10.81 gdcm::Defs Class Reference

FIXME I do not like the name '[Defs](#)'.

```
#include <gdcmDefs.h>
```

### Public Member Functions

- [Defs](#) ()
- [Defs](#) (const [Defs](#) &val)=delete
- [~Defs](#) ()
- const [IOD](#) & [GetIODFromFile](#) (const [File](#) &file) const
- [IODs](#) & [GetIODs](#) ()
- const [IODs](#) & [GetIODs](#) () const
- [Macros](#) & [GetMacros](#) ()
- const [Macros](#) & [GetMacros](#) () const
- [Modules](#) & [GetModules](#) ()
- const [Modules](#) & [GetModules](#) () const
- [Type](#) [GetTypeFromTag](#) (const [File](#) &file, const [Tag](#) &tag) const
- bool [IsEmpty](#) () const
- [Defs](#) & [operator=](#) (const [Defs](#) &val)=delete
- bool [Verify](#) (const [DataSet](#) &ds) const
- bool [Verify](#) (const [File](#) &file) const

### Static Public Member Functions

- static const char \* [GetIODNameFromMediaStorage](#) ([MediaStorage](#) const &ms)

### Protected Member Functions

- void [LoadDefaults](#) ()
- void [LoadFromFile](#) (const char \*filename)

### Friends

- class [Global](#)



### 10.81.1 Detailed Description

FIXME I do not like the name '[Defs](#)'.

#### Note

bla

#### Examples

[GenerateStandardSOPClasses.cxx](#), and [TraverseModules.cxx](#).

### 10.81.2 Constructor & Destructor Documentation

#### 10.81.2.1 Defs() [1/2]

```
gdcm::Defs::Defs ( )
```

#### 10.81.2.2 ~Defs()

```
gdcm::Defs::~~Defs ( )
```

#### 10.81.2.3 Defs() [2/2]

```
gdcm::Defs::Defs (
    const Defs & val ) [delete]
```

### 10.81.3 Member Function Documentation

#### 10.81.3.1 GetIODFromFile()

```
const IOD & gdcm::Defs::GetIODFromFile (
    const File & file ) const
```

### 10.81.3.2 GetIODNameFromMediaStorage()

```
static const char * gdcM::Defs::GetIODNameFromMediaStorage (
    MediaStorage const & ms ) [static]
```

#### Examples

[GenerateStandardSOPClasses.cxx](#).

### 10.81.3.3 GetIODs() [1/2]

```
IODs & gdcM::Defs::GetIODs ( ) [inline]
```

### 10.81.3.4 GetIODs() [2/2]

```
const IODs & gdcM::Defs::GetIODs ( ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 10.81.3.5 GetMacros() [1/2]

```
Macros & gdcM::Defs::GetMacros ( ) [inline]
```

### 10.81.3.6 GetMacros() [2/2]

```
const Macros & gdcM::Defs::GetMacros ( ) const [inline]
```

Users should not directly use [Macro](#). [Macro](#) are simply a way for DICOM WG to re-use [Tables](#). [Macros](#) are conveniently wrapped within [Modules](#). See [gdcM::Module](#) API directly

#### Examples

[TraverseModules.cxx](#).

### 10.81.3.7 GetModules() [1/2]

```
Modules & gdcm::Defs::GetModules ( ) [inline]
```

### 10.81.3.8 GetModules() [2/2]

```
const Modules & gdcm::Defs::GetModules ( ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 10.81.3.9 GetTypeFromTag()

```
Type gdcm::Defs::GetTypeFromTag (
    const File & file,
    const Tag & tag ) const
```

### 10.81.3.10 IsEmpty()

```
bool gdcm::Defs::IsEmpty ( ) const [inline]
```

### 10.81.3.11 LoadDefaults()

```
void gdcm::Defs::LoadDefaults ( ) [protected]
```

### 10.81.3.12 LoadFromFile()

```
void gdcm::Defs::LoadFromFile (
    const char * filename ) [protected]
```

### 10.81.3.13 operator=()

```
Defs & gdcM::Defs::operator= (
    const Defs & val ) [delete]
```

### 10.81.3.14 Verify() [1/2]

```
bool gdcM::Defs::Verify (
    const DataSet & ds ) const
```

### 10.81.3.15 Verify() [2/2]

```
bool gdcM::Defs::Verify (
    const File & file ) const
```

## 10.81.4 Friends And Related Function Documentation

### 10.81.4.1 Global

```
friend class Global [friend]
```

The documentation for this class was generated from the following file:

- [gdcMDefs.h](#)

## 10.82 gdcM::DeltaEncodingCodec Class Reference

[DeltaEncodingCodec](#) compression used by some private vendor.

```
#include <gdcMDeltaEncodingCodec.h>
```

Inheritance diagram for gdcM::DeltaEncodingCodec:

Collaboration diagram for gdcM::DeltaEncodingCodec:

## Public Member Functions

- [DeltaEncodingCodec](#) ()
- [~DeltaEncodingCodec](#) ()
- bool [CanDecode](#) ([TransferSyntax](#) const &ts)
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os)

*Decode.*

## Protected Member Functions

- bool [Decode](#) (std::istream &is, std::ostream &os)

## Additional Inherited Members

### 10.82.1 Detailed Description

[DeltaEncodingCodec](#) compression used by some private vendor.

### 10.82.2 Constructor & Destructor Documentation

#### 10.82.2.1 [DeltaEncodingCodec](#)()

```
gdcm::DeltaEncodingCodec::DeltaEncodingCodec ( )
```

#### 10.82.2.2 [~DeltaEncodingCodec](#)()

```
gdcm::DeltaEncodingCodec::~~DeltaEncodingCodec ( )
```

### 10.82.3 Member Function Documentation

#### 10.82.3.1 [CanDecode](#)()

```
bool gdcm::DeltaEncodingCodec::CanDecode (
    TransferSyntax const & ts )
```

### 10.82.3.2 Decode() [1/2]

```
bool gdcM::DeltaEncodingCodec::Decode (
    DataElement const & ,
    DataElement & ) [virtual]
```

Decode.

Reimplemented from [gdcM::Decoder](#).

### 10.82.3.3 Decode() [2/2]

```
bool gdcM::DeltaEncodingCodec::Decode (
    std::istream & is,
    std::ostream & os ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcMDeltaEncodingCodec.h](#)

## 10.83 gdcM::DICOMDIR Class Reference

[DICOMDIR](#) class.

```
#include <gdcMDICOMDIR.h>
```

### Public Member Functions

- [DICOMDIR](#) ()=default
- [DICOMDIR](#) (FileSet fs)

### 10.83.1 Detailed Description

[DICOMDIR](#) class.

Structured for handling [DICOMDIR](#)

### 10.83.2 Constructor & Destructor Documentation

**10.83.2.1 DICOMDIR() [1/2]**

```
gdcm::DICOMDIR::DICOMDIR ( ) [default]
```

**10.83.2.2 DICOMDIR() [2/2]**

```
gdcm::DICOMDIR::DICOMDIR (
    FileSet fs ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmDICOMDIR.h](#)

**10.84 gdcm::DICOMDIRGenerator Class Reference**

[DICOMDIRGenerator](#) class.

```
#include <gdcmDICOMDIRGenerator.h>
```

**Public Types**

- typedef [Directory::FileNamesType](#) FileNamesType
- typedef [Directory::FilenameType](#) FilenameType

**Public Member Functions**

- [DICOMDIRGenerator](#) ()
- [~DICOMDIRGenerator](#) ()
- bool [Generate](#) ()
 

*Main function to generate the [DICOMDIR](#).*
- [File](#) & [GetFile](#) ()
- void [SetDescriptor](#) (const char \*d)
- void [SetFile](#) (const [File](#) &f)
 

*Set/Get file. The [DICOMDIR](#) file will be valid once a call to Generate has been done.*
- void [SetFileNames](#) ([FileNamesType](#) const &fns)
 

*Set the list of filenames from which the [DICOMDIR](#) should be generated from.*
- void [SetRootDirectory](#) ([FilenameType](#) const &root)
 

*Set the root directory from which the filenames should be considered.*

## Protected Member Functions

- bool [AddImageDirectoryRecord](#) ()
- bool [AddPatientDirectoryRecord](#) ()
- bool [AddSeriesDirectoryRecord](#) ()
- bool [AddStudyDirectoryRecord](#) ()
- [Scanner](#) & [GetScanner](#) ()

### 10.84.1 Detailed Description

[DICOmdirGenerator](#) class.

This is a STD-GEN-CD [DICOmdir](#) generator. ref: PS 3.11-2008 Annex D (Normative) - General Purpose CD-R and DVD Interchange Profiles

#### Note

PS 3.11 - 2008 / D.3.2 Physical Medium And Medium Format The STD-GEN-CD and STD-GEN-SEC-CD application profiles require the 120 mm CD-R physical medium with the ISO/IEC 9660 Media Format, as defined in PS3.12. See also PS 3.12 - 2008 / Annex F 120mm CD-R Medium (Normative) and PS 3.10 - 2008 / 8 DICOM [File Service](#) / 8.1 FILE-SET

#### Warning

: PS 3.11 - 2008 / D.3.1 SOP Classes and Transfer Syntaxes Composite [Image](#) & Stand-alone Storage are required to be stored as Explicit [VR](#) Little Endian Uncompressed (1.2.840.10008.1.2.1). When a DICOM file is found using another Transfer Syntax the generator will simply stops.

- Input files should be Explicit [VR](#) Little Endian
- filenames should be valid [VR::CS](#) value (16 bytes, upper case ...)

**Bug** : There is a current limitation of not handling Referenced SOP Class UID / Referenced SOP Instance UID simply because the [Scanner](#) does not allow us See PS 3.11 / [Table D.3-2](#) STD-GEN Additional [DICOmdir](#) Keys

#### Examples

[GenerateDICOmdir.cs](#).

### 10.84.2 Member Typedef Documentation

#### 10.84.2.1 FilenamesType

```
typedef Directory::FilenamesType gdcm::DICOmdirGenerator::FilenamesType
```



### 10.84.2.2 FilenameType

```
typedef Directory::FilenameType gdcm::DICOMDIRGenerator::FilenameType
```

## 10.84.3 Constructor & Destructor Documentation

### 10.84.3.1 DICOMDIRGenerator()

```
gdcm::DICOMDIRGenerator::DICOMDIRGenerator ( )
```

### 10.84.3.2 ~DICOMDIRGenerator()

```
gdcm::DICOMDIRGenerator::~~DICOMDIRGenerator ( )
```

## 10.84.4 Member Function Documentation

### 10.84.4.1 AddImageDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddImageDirectoryRecord ( ) [protected]
```

### 10.84.4.2 AddPatientDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddPatientDirectoryRecord ( ) [protected]
```

### 10.84.4.3 AddSeriesDirectoryRecord()

```
bool gdcm::DICOMDIRGenerator::AddSeriesDirectoryRecord ( ) [protected]
```

#### 10.84.4.4 AddStudyDirectoryRecord()

```
bool gdcM::DICOMDIRGenerator::AddStudyDirectoryRecord ( ) [protected]
```

#### 10.84.4.5 Generate()

```
bool gdcM::DICOMDIRGenerator::Generate ( )
```

Main function to generate the [DICOMDIR](#).

##### Examples

[GenerateDICOMDIR.cs](#).

#### 10.84.4.6 GetFile()

```
File & gdcM::DICOMDIRGenerator::GetFile ( )
```

##### Examples

[GenerateDICOMDIR.cs](#).

#### 10.84.4.7 GetScanner()

```
Scanner & gdcM::DICOMDIRGenerator::GetScanner ( ) [protected]
```

#### 10.84.4.8 SetDescriptor()

```
void gdcM::DICOMDIRGenerator::SetDescriptor (
    const char * d )
```

Set the [File](#) Set ID.

##### Warning

this need to be a valid [VR::CS](#) value

##### Examples

[GenerateDICOMDIR.cs](#).

#### 10.84.4.9 SetFile()

```
void gdcm::DICOMDIRGenerator::SetFile (
    const File & f )
```

Set/Get file. The [DICOMDIR](#) file will be valid once a call to Generate has been done.

#### 10.84.4.10 SetFileNames()

```
void gdcm::DICOMDIRGenerator::SetFileNames (
    FilenameType const & fns )
```

Set the list of filenames from which the [DICOMDIR](#) should be generated from.

#### Examples

[GenerateDICOMDIR.cs](#).

#### 10.84.4.11 SetRootDirectory()

```
void gdcm::DICOMDIRGenerator::SetRootDirectory (
    FilenameType const & root )
```

Set the root directory from which the filenames should be considered.

The documentation for this class was generated from the following file:

- [gdcmDICOMDIRGenerator.h](#)

## 10.85 gdcm::Dict Class Reference

Class to represent a map of [DictEntry](#).

```
#include <gdcmDict.h>
```

### Public Types

- typedef MapDictEntry::const\_iterator [ConstIterator](#)
- typedef MapDictEntry::iterator [Iterator](#)
- typedef std::map< [Tag](#), [DictEntry](#) > [MapDictEntry](#)

## Public Member Functions

- [Dict](#) ()
- [Dict](#) (const [Dict](#) &\_val)=delete
- void [AddDictEntry](#) (const [Tag](#) &tag, const [DictEntry](#) &de)
- [ConstIterator Begin](#) () const
- [ConstIterator End](#) () const
- const [DictEntry](#) & [GetDictEntry](#) (const [Tag](#) &tag) const
- const [DictEntry](#) & [GetDictEntryByKeyword](#) (const char \*keyword, [Tag](#) &tag) const
- const [DictEntry](#) & [GetDictEntryByName](#) (const char \*name, [Tag](#) &tag) const
- const char \* [GetKeywordFromTag](#) ([Tag](#) const &tag) const  
*Function to return the Keyword from a [Tag](#).*
- bool [IsEmpty](#) () const
- [Dict](#) & [operator=](#) (const [Dict](#) &\_val)=delete

## Protected Member Functions

- void [LoadDefault](#) ()

## Friends

- class [Dicts](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Dict](#) &\_val)

### 10.85.1 Detailed Description

Class to represent a map of [DictEntry](#).

#### Note

bla TODO FIXME: For [Element](#) == 0x0 need to return Name = Group Length ValueRepresentation = UL Value↔  
 Multiplicity = 1

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [PublicDict.cxx](#), and [ReadAndPrintAttributes.cxx](#).

### 10.85.2 Member Typedef Documentation

#### 10.85.2.1 ConstIterator

```
typedef MapDictEntry::const_iterator gdcmm::Dict::ConstIterator
```

### 10.85.2.2 Iterator

```
typedef MapDictEntry::iterator gdcmm::Dict::Iterator
```

### 10.85.2.3 MapDictEntry

```
typedef std::map<Tag, DictEntry> gdcmm::Dict::MapDictEntry
```

## 10.85.3 Constructor & Destructor Documentation

### 10.85.3.1 Dict() [1/2]

```
gdcmm::Dict::Dict ( ) [inline]
```

### 10.85.3.2 Dict() [2/2]

```
gdcmm::Dict::Dict (
    const Dict & _val ) [delete]
```

## 10.85.4 Member Function Documentation

### 10.85.4.1 AddDictEntry()

```
void gdcmm::Dict::AddDictEntry (
    const Tag & tag,
    const DictEntry & de ) [inline]
```

#### 10.85.4.2 Begin()

```
ConstIterator gdcm::Dict::Begin ( ) const [inline]
```

##### Examples

[GenAllVR.cxx](#), and [GenFakeIdentifyFile.cxx](#).

#### 10.85.4.3 End()

```
ConstIterator gdcm::Dict::End ( ) const [inline]
```

##### Examples

[GenAllVR.cxx](#), and [GenFakeIdentifyFile.cxx](#).

#### 10.85.4.4 GetDictEntry()

```
const DictEntry & gdcm::Dict::GetDictEntry (
    const Tag & tag ) const [inline]
```

##### Examples

[GenFakeIdentifyFile.cxx](#), and [PublicDict.cxx](#).

#### 10.85.4.5 GetDictEntryByKeyword()

```
const DictEntry & gdcm::Dict::GetDictEntryByKeyword (
    const char * keyword,
    Tag & tag ) const [inline]
```

Lookup [DictEntry](#) by keyword. Even if DICOM standard defines keyword as being unique. The lookup table is built on [Tag](#). Therefore looking up a [DictEntry](#) by Keyword is more inefficient than looking up by [Tag](#).

#### 10.85.4.6 GetDictEntryByName()

```
const DictEntry & gdcmm::Dict::GetDictEntryByName (
    const char * name,
    Tag & tag ) const [inline]
```

Inefficient way of looking up tag by name. Technically DICOM does not guarantee uniqueness (and [Curve](#) / [Overlay](#) are there to prove it). But most of the time name is in fact unique and can be uniquely link to a tag

#### Examples

[ReadAndPrintAttributes.cxx](#).

#### 10.85.4.7 GetKeywordFromTag()

```
const char * gdcmm::Dict::GetKeywordFromTag (
    Tag const & tag ) const [inline]
```

Function to return the Keyword from a [Tag](#).

#### 10.85.4.8 IsEmpty()

```
bool gdcmm::Dict::IsEmpty ( ) const [inline]
```

#### 10.85.4.9 LoadDefault()

```
void gdcmm::Dict::LoadDefault ( ) [protected]
```

#### 10.85.4.10 operator=()

```
Dict & gdcmm::Dict::operator= (
    const Dict & _val ) [delete]
```

### 10.85.5 Friends And Related Function Documentation

### 10.85.5.1 Dicts

```
friend class Dicts [friend]
```

### 10.85.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Dict & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmDict.h](#)

## 10.86 gdcm::DictConverter Class Reference

Class to convert a .dic file into something else:

```
#include <gdcmDictConverter.h>
```

### Public Types

- enum [OutputTypes](#) {  
    [DICT\\_DEFAULT](#) = 0 ,  
    [DICT\\_DEBUG](#) ,  
    [DICT\\_XML](#) }

### Public Member Functions

- [DictConverter](#) ()
- [~DictConverter](#) ()
- void [Convert](#) ()
- const std::string & [GetDictName](#) () const
- const std::string & [GetInputFilename](#) () const
- const std::string & [GetOutputFilename](#) () const
- int [GetOutputType](#) () const
- void [SetDictName](#) (const char \*name)
- void [SetInputFileName](#) (const char \*filename)
- void [SetOutputFileName](#) (const char \*filename)
- void [SetOutputType](#) (int type)



## Static Public Member Functions

- static bool [Readuint16](#) (const char \*raw, uint16\_t &ov)
- static bool [ReadVM](#) (const char \*raw, [VM::VMType](#) &type)
- static bool [ReadVR](#) (const char \*raw, [VR::VRType](#) &type)

## Protected Member Functions

- void [AddGroupLength](#) ()
- bool [ConvertToCXX](#) (const char \*raw, std::string &cxx)
- bool [ConvertToXML](#) (const char \*raw, std::string &cxx)
- void [WriteFooter](#) ()
- void [WriteHeader](#) ()

### 10.86.1 Detailed Description

Class to convert a .dic file into something else:

- CXX code : embed dict into shared lib (DICT\_DEFAULT)
- Debug mode (DICT\_DEBUG)
- XML dict (DICT\_XML)

Note

### 10.86.2 Member Enumeration Documentation

#### 10.86.2.1 OutputTypes

```
enum gdcmm::DictConverter::OutputTypes
```

Enumerator

DICT_DEFAULT	
DICT_DEBUG	
DICT_XML	

### 10.86.3 Constructor & Destructor Documentation

#### 10.86.3.1 DictConverter()

```
gdcM::DictConverter::DictConverter ( )
```

#### 10.86.3.2 ~DictConverter()

```
gdcM::DictConverter::~~DictConverter ( )
```

### 10.86.4 Member Function Documentation

#### 10.86.4.1 AddGroupLength()

```
void gdcM::DictConverter::AddGroupLength ( ) [protected]
```

#### 10.86.4.2 Convert()

```
void gdcM::DictConverter::Convert ( )
```

#### 10.86.4.3 ConvertToCXX()

```
bool gdcM::DictConverter::ConvertToCXX (
    const char * raw,
    std::string & cxx ) [protected]
```

#### 10.86.4.4 ConvertToXML()

```
bool gdcm::DictConverter::ConvertToXML (
    const char * raw,
    std::string & cxx ) [protected]
```

#### 10.86.4.5 GetDictName()

```
const std::string & gdcm::DictConverter::GetDictName ( ) const
```

#### 10.86.4.6 GetInputFilename()

```
const std::string & gdcm::DictConverter::GetInputFilename ( ) const
```

#### 10.86.4.7 GetOutputFilename()

```
const std::string & gdcm::DictConverter::GetOutputFilename ( ) const
```

#### 10.86.4.8 GetOutputType()

```
int gdcm::DictConverter::GetOutputType ( ) const [inline]
```

#### 10.86.4.9 Readuint16()

```
static bool gdcm::DictConverter::Readuint16 (
    const char * raw,
    uint16_t & ov ) [static]
```

#### 10.86.4.10 ReadVM()

```
static bool gdcm::DictConverter::ReadVM (
    const char * raw,
    VM::VMType & type ) [static]
```

#### 10.86.4.11 ReadVR()

```
static bool gdcm::DictConverter::ReadVR (
    const char * raw,
    VR::VRType & type ) [static]
```

#### 10.86.4.12 SetDictName()

```
void gdcm::DictConverter::SetDictName (
    const char * name )
```

#### 10.86.4.13 SetInputFileName()

```
void gdcm::DictConverter::SetInputFileName (
    const char * filename )
```

#### 10.86.4.14 SetOutputFileName()

```
void gdcm::DictConverter::SetOutputFileName (
    const char * filename )
```

#### 10.86.4.15 SetOutputType()

```
void gdcm::DictConverter::SetOutputType (
    int type ) [inline]
```

**10.86.4.16 WriteFooter()**

```
void gdcm::DictConverter::WriteFooter ( ) [protected]
```

**10.86.4.17 WriteHeader()**

```
void gdcm::DictConverter::WriteHeader ( ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmDictConverter.h](#)

**10.87 gdcm::DictEntry Class Reference**

Class to represent an Entry in the [Dict](#).

```
#include <gdcmDictEntry.h>
```

**Public Member Functions**

- [DictEntry](#) (const char \*name="", const char \*keyword="", [VR](#) const &vr=[VR::INVALID](#), [VM](#) const &vm=[VM::VM0](#), bool ret=false)
- const char \* [GetKeyword](#) () const  
*same as GetName but without spaces...*
- const char \* [GetName](#) () const  
*Set/Get Name.*
- bool [GetRetired](#) () const  
*Set/Get Retired flag.*
- const [VM](#) & [GetVM](#) () const  
*Set/Get VM.*
- const [VR](#) & [GetVR](#) () const  
*Set/Get VR.*
- bool [IsUnique](#) () const
- void [SetElementXX](#) (bool v)  
*Set whether element is shared in multiple elements (Source [Image](#) IDs typically)*
- void [SetGroupXX](#) (bool v)  
*Set whether element is shared in multiple groups (Curve/Overlay typically)*
- void [SetKeyword](#) (const char \*keyword)
- void [SetName](#) (const char \*name)
- void [SetRetired](#) (bool retired)
- void [SetVM](#) ([VM](#) const &vm)
- void [SetVR](#) (const [VR](#) &vr)

## Friends

- class [Dict](#)
- `std::ostream & operator<< (std::ostream &_os, const DictEntry &_val)`

### 10.87.1 Detailed Description

Class to represent an Entry in the [Dict](#).

Does not really exist within the DICOM definition, just a way to minimize storage and have a mapping from [gdcm::Tag](#) to the needed information

#### Note

bla TODO FIXME: Need a PublicDictEntry...indeed [DictEntry](#) has a notion of retired which does not exist in PrivateDictEntry...

#### See also

[gdcm::Dict](#)

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [PublicDict.cxx](#), and [TraverseModules.cxx](#).

### 10.87.2 Constructor & Destructor Documentation

#### 10.87.2.1 DictEntry()

```
gdcm::DictEntry::DictEntry (
    const char * name = "",
    const char * keyword = "",
    VR const & vr = VR::INVALID,
    VM const & vm = VM::VM0,
    bool ret = false ) [inline]
```

### 10.87.3 Member Function Documentation

### 10.87.3.1 GetKeyword()

```
const char * gdcm::DictEntry::GetKeyword ( ) const [inline]
```

same as GetName but without spaces...

### 10.87.3.2 GetName()

```
const char * gdcm::DictEntry::GetName ( ) const [inline]
```

Set/Get Name.

Referenced by [gdcm::PrivateDict::PrintXML\(\)](#).

### 10.87.3.3 GetRetired()

```
bool gdcm::DictEntry::GetRetired ( ) const [inline]
```

Set/Get Retired flag.

#### Examples

[GenAllVR.cxx](#).

### 10.87.3.4 GetVM()

```
const VM & gdcm::DictEntry::GetVM ( ) const [inline]
```

Set/Get VM.

Referenced by [gdcm::PrivateDict::AddDictEntry\(\)](#), and [gdcm::PrivateDict::PrintXML\(\)](#).

### 10.87.3.5 GetVR()

```
const VR & gdcM::DictEntry::GetVR ( ) const [inline]
```

Set/Get [VR](#).

#### Examples

[GenAllVR.cxx](#), and [GenFakeIdentifyFile.cxx](#).

Referenced by [gdcM::PrivateDict::AddDictEntry\(\)](#), and [gdcM::PrivateDict::PrintXML\(\)](#).

### 10.87.3.6 IsUnique()

```
bool gdcM::DictEntry::IsUnique ( ) const [inline]
```

Return whether the name of the [DataElement](#) can be considered to be unique. As of 2008 all elements name were unique (except the explicitly 'XX' ones)

### 10.87.3.7 SetElementXX()

```
void gdcM::DictEntry::SetElementXX (
    bool v ) [inline]
```

Set whether element is shared in multiple elements (Source [Image](#) IDs typically)

### 10.87.3.8 SetGroupXX()

```
void gdcM::DictEntry::SetGroupXX (
    bool v ) [inline]
```

Set whether element is shared in multiple groups (Curve/Overlay typically)

### 10.87.3.9 SetKeyword()

```
void gdcM::DictEntry::SetKeyword (
    const char * keyword ) [inline]
```



### 10.87.3.10 SetName()

```
void gdcmm::DictEntry::SetName (
    const char * name ) [inline]
```

### 10.87.3.11 SetRetired()

```
void gdcmm::DictEntry::SetRetired (
    bool retired ) [inline]
```

### 10.87.3.12 SetVM()

```
void gdcmm::DictEntry::SetVM (
    VM const & vm ) [inline]
```

Referenced by [gdcmm::PrivateDict::AddDictEntry\(\)](#).

### 10.87.3.13 SetVR()

```
void gdcmm::DictEntry::SetVR (
    const VR & vr ) [inline]
```

Referenced by [gdcmm::PrivateDict::AddDictEntry\(\)](#).

## 10.87.4 Friends And Related Function Documentation

### 10.87.4.1 Dict

```
friend class Dict [friend]
```

#### 10.87.4.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DictEntry & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcDictEntry.h](#)

### 10.88 gdcDictPrinter Class Reference

[DictPrinter](#) class.

```
#include <gdcDictPrinter.h>
```

Inheritance diagram for gdcDictPrinter:

Collaboration diagram for gdcDictPrinter:

#### Public Member Functions

- [DictPrinter](#) ()
- [~DictPrinter](#) ()
- void [Print](#) (std::ostream &os)

#### Protected Member Functions

- void [PrintDataElement2](#) (std::ostream &os, const [DataSet](#) &ds, const [DataElement](#) &ide)
- void [PrintDataSet2](#) (std::ostream &os, const [DataSet](#) &ds)

#### Additional Inherited Members

#### 10.88.1 Detailed Description

[DictPrinter](#) class.

#### 10.88.2 Constructor & Destructor Documentation

### 10.88.2.1 DictPrinter()

```
gdcm::DictPrinter::DictPrinter ( )
```

### 10.88.2.2 ~DictPrinter()

```
gdcm::DictPrinter::~~DictPrinter ( )
```

## 10.88.3 Member Function Documentation

### 10.88.3.1 Print()

```
void gdcm::DictPrinter::Print (
    std::ostream & os )
```

### 10.88.3.2 PrintDataElement2()

```
void gdcm::DictPrinter::PrintDataElement2 (
    std::ostream & os,
    const DataSet & ds,
    const DataElement & ide ) [protected]
```

### 10.88.3.3 PrintDataSet2()

```
void gdcm::DictPrinter::PrintDataSet2 (
    std::ostream & os,
    const DataSet & ds ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmDictPrinter.h](#)

## 10.89 gdcmm::Dicts Class Reference

Class to manipulate the sum of knowledge (all the dict user load)

```
#include <gdcmmDicts.h>
```

### Public Member Functions

- [Dicts](#) ()
  - [Dicts](#) (const [Dicts](#) &\_val)=delete
  - [~Dicts](#) ()
  - const [CSAHeaderDict](#) & [GetCSAHeaderDict](#) () const
  - const [DictEntry](#) & [GetDictEntry](#) (const [PrivateTag](#) &tag) const
  - const [DictEntry](#) & [GetDictEntry](#) (const [Tag](#) &tag, const char \*owner=nullptr) const
- THREAD SAFE.*
- [PrivateDict](#) & [GetPrivateDict](#) ()
  - const [PrivateDict](#) & [GetPrivateDict](#) () const
  - const [Dict](#) & [GetPublicDict](#) () const
  - bool [IsEmpty](#) () const
  - [Dicts](#) & [operator=](#) (const [Dicts](#) &\_val)=delete

### Protected Types

- enum [ConstructorType](#) {  
    [PHILIPS](#) ,  
    [GEMS](#) ,  
    [SIEMENS](#) }

### Protected Member Functions

- void [LoadDefaults](#) ()

### Static Protected Member Functions

- static const char \* [GetConstructorString](#) ([ConstructorType](#) type)

### Friends

- class [Global](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [Dicts](#) &d)

## 10.89.1 Detailed Description

Class to manipulate the sum of knowledge (all the dict user load)

Note

bla

Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

## 10.89.2 Member Enumeration Documentation

### 10.89.2.1 ConstructorType

```
enum gdcmm::Dicts::ConstructorType [protected]
```

Enumerator

PHILIPS	
GEMS	
SIEMENS	

## 10.89.3 Constructor & Destructor Documentation

### 10.89.3.1 Dicts() [1/2]

```
gdcmm::Dicts::Dicts ( )
```

### 10.89.3.2 ~Dicts()

```
gdcmm::Dicts::~~Dicts ( )
```

### 10.89.3.3 Dicts() [2/2]

```
gdcmm::Dicts::Dicts (
    const Dicts & _val ) [delete]
```

## 10.89.4 Member Function Documentation

### 10.89.4.1 GetConstructorString()

```
static const char * gdcmm::Dicts::GetConstructorString (
    ConstructorType type ) [static], [protected]
```

### 10.89.4.2 GetCSAHeaderDict()

```
const CSAHeaderDict & gdcmm::Dicts::GetCSAHeaderDict ( ) const
```

#### Examples

[MrProtocol.cxx](#).

### 10.89.4.3 GetDictEntry() [1/2]

```
const DictEntry & gdcmm::Dicts::GetDictEntry (
    const PrivateTag & tag ) const
```

### 10.89.4.4 GetDictEntry() [2/2]

```
const DictEntry & gdcmm::Dicts::GetDictEntry (
    const Tag & tag,
    const char * owner = nullptr ) const
```

THREAD SAFE.

works for both public and private dicts: owner is null for public dict

#### Warning

owner need to be set to appropriate owner for call to work. see

#### Examples

[PublicDict.cxx](#), and [TraverseModules.cxx](#).

#### 10.89.4.5 GetPrivateDict() [1/2]

```
PrivateDict & gdcmm::Dicts::GetPrivateDict ( )
```

#### 10.89.4.6 GetPrivateDict() [2/2]

```
const PrivateDict & gdcmm::Dicts::GetPrivateDict ( ) const
```

#### 10.89.4.7 GetPublicDict()

```
const Dict & gdcmm::Dicts::GetPublicDict ( ) const
```

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [PublicDict.cxx](#), and [ReadAndPrintAttributes.cxx](#).

#### 10.89.4.8 IsEmpty()

```
bool gdcmm::Dicts::IsEmpty ( ) const [inline]
```

#### 10.89.4.9 LoadDefaults()

```
void gdcmm::Dicts::LoadDefaults ( ) [protected]
```

#### 10.89.4.10 operator=()

```
Dicts & gdcmm::Dicts::operator= (
    const Dicts & _val ) [delete]
```

### 10.89.5 Friends And Related Function Documentation

### 10.89.5.1 Global

```
friend class Global [friend]
```

### 10.89.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Dicts & d ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcnDicts.h](#)

## 10.90 gdcn::network::DIMSE Class Reference

[DIMSE](#).

```
#include <gdcnDIMSE.h>
```

### Public Types

- enum [CommandTypes](#) {
  - [C\\_STORE\\_RQ](#) = 0x0001 ,
  - [C\\_STORE\\_RSP](#) = 0x8001 ,
  - [C\\_GET\\_RQ](#) = 0x0010 ,
  - [C\\_GET\\_RSP](#) = 0x8010 ,
  - [C\\_FIND\\_RQ](#) = 0x0020 ,
  - [C\\_FIND\\_RSP](#) = 0x8020 ,
  - [C\\_MOVE\\_RQ](#) = 0x0021 ,
  - [C\\_MOVE\\_RSP](#) = 0x8021 ,
  - [C\\_ECHO\\_RQ](#) = 0x0030 ,
  - [C\\_ECHO\\_RSP](#) = 0x8030 ,
  - [N\\_EVENT\\_REPORT\\_RQ](#) = 0x0100 ,
  - [N\\_EVENT\\_REPORT\\_RSP](#) = 0x8100 ,
  - [N\\_GET\\_RQ](#) = 0x0110 ,
  - [N\\_GET\\_RSP](#) = 0x8110 ,
  - [N\\_SET\\_RQ](#) = 0x0120 ,
  - [N\\_SET\\_RSP](#) = 0x8120 ,
  - [N\\_ACTION\\_RQ](#) = 0x0130 ,
  - [N\\_ACTION\\_RSP](#) = 0x8130 ,
  - [N\\_CREATE\\_RQ](#) = 0x0140 ,
  - [N\\_CREATE\\_RSP](#) = 0x8140 ,
  - [N\\_DELETE\\_RQ](#) = 0x0150 ,
  - [N\\_DELETE\\_RSP](#) = 0x8150 ,
  - [C\\_CANCEL\\_RQ](#) = 0x0FFF }



## 10.90.1 Detailed Description

DIMSE.

PS 3.7 - 2009 Annex E [Command](#) Dictionary (Normative) E.1 REGISTRY OF DICOM COMMAND ELEMENTS [Table](#)  
E.1-1 COMMAND FIELDS (PART 1)

## 10.90.2 Member Enumeration Documentation

### 10.90.2.1 CommandTypes

```
enum gdcmm::network::DIMSE::CommandTypes
```

Enumerator

C_STORE_RQ	
C_STORE_RSP	
C_GET_RQ	
C_GET_RSP	
C_FIND_RQ	
C_FIND_RSP	
C_MOVE_RQ	
C_MOVE_RSP	
C_ECHO_RQ	
C_ECHO_RSP	
N_EVENT_REPORT_RQ	
N_EVENT_REPORT_RSP	
N_GET_RQ	
N_GET_RSP	
N_SET_RQ	
N_SET_RSP	
N_ACTION_RQ	
N_ACTION_RSP	
N_CREATE_RQ	
N_CREATE_RSP	
N_DELETE_RQ	
N_DELETE_RSP	
C_CANCEL_RQ	

The documentation for this class was generated from the following file:

- [gdcmmDIMSE.h](#)

## 10.91 gdcm::DirectionCosines Class Reference

class to handle [DirectionCosines](#)

```
#include <gdcmDirectionCosines.h>
```

### Public Member Functions

- [DirectionCosines](#) ()
- [DirectionCosines](#) (const double dircos[6])
- [~DirectionCosines](#) ()
- double [ComputeDistAlongNormal](#) (const double ipp[3]) const  
*Compute the distance along the normal.*
- void [Cross](#) (double z[3]) const  
*Compute Cross product.*
- double [CrossDot](#) ([DirectionCosines](#) const &dc) const  
*Compute the Dot product of the two cross vector of both [DirectionCosines](#) object.*
- double [Dot](#) () const  
*Compute Dot.*
- bool [IsValid](#) () const  
*Return whether or not this is a valid direction cosines.*
- void [Normalize](#) ()  
*Normalize in-place.*
- [operator const double \\*](#) () const  
*Make the class behave like a const double \*.*
- void [Print](#) (std::ostream &) const  
*Print.*
- bool [SetFromString](#) (const char \*str)

### Static Public Member Functions

- static double [Dot](#) (const double x[3], const double y[3])  
*Compute Dot.*
- static void [Normalize](#) (double v[3])  
*Normalize in-place.*

### 10.91.1 Detailed Description

class to handle [DirectionCosines](#)

#### Examples

[DiscriminateVolume.cxx](#).

## 10.91.2 Constructor & Destructor Documentation

### 10.91.2.1 DirectionCosines() [1/2]

```
gdcmm::DirectionCosines::DirectionCosines ( )
```

### 10.91.2.2 DirectionCosines() [2/2]

```
gdcmm::DirectionCosines::DirectionCosines (
    const double dircos[6] )
```

### 10.91.2.3 ~DirectionCosines()

```
gdcmm::DirectionCosines::~~DirectionCosines ( )
```

## 10.91.3 Member Function Documentation

### 10.91.3.1 ComputeDistAlongNormal()

```
double gdcmm::DirectionCosines::ComputeDistAlongNormal (
    const double ipp[3] ) const
```

Compute the distance along the normal.

### 10.91.3.2 Cross()

```
void gdcmm::DirectionCosines::Cross (
    double z[3] ) const
```

Compute Cross product.

### 10.91.3.3 CrossDot()

```
double gdcm::DirectionCosines::CrossDot (
    DirectionCosines const & dc ) const
```

Compute the Dot product of the two cross vector of both [DirectionCosines](#) object.

#### Examples

[DiscriminateVolume.cxx](#).

### 10.91.3.4 Dot() [1/2]

```
double gdcm::DirectionCosines::Dot ( ) const
```

Compute Dot.

### 10.91.3.5 Dot() [2/2]

```
static double gdcm::DirectionCosines::Dot (
    const double x[3],
    const double y[3] ) [static]
```

Compute Dot.

### 10.91.3.6 IsValid()

```
bool gdcm::DirectionCosines::IsValid ( ) const
```

Return whether or not this is a valid direction cosines.

### 10.91.3.7 Normalize() [1/2]

```
void gdcm::DirectionCosines::Normalize ( )
```

Normalize in-place.

### 10.91.3.8 Normalize() [2/2]

```
static void gdcm::DirectionCosines::Normalize (
    double v[3] ) [static]
```

Normalize in-place.

### 10.91.3.9 operator const double \*()

```
gdcm::DirectionCosines::operator const double * ( ) const [inline]
```

Make the class behave like a const double \*.

### 10.91.3.10 Print()

```
void gdcm::DirectionCosines::Print (
    std::ostream & ) const
```

Print.

### 10.91.3.11 SetFromString()

```
bool gdcm::DirectionCosines::SetFromString (
    const char * str )
```

Initialize from string str. It requires 6 floating point separated by a backslash character.

#### Examples

[DiscriminateVolume.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmDirectionCosines.h](#)

## 10.92 gdcm::Directory Class Reference

Class for manipulation directories.

```
#include <gdcmDirectory.h>
```

## Public Types

- typedef std::vector< [FilenameType](#) > [FilenamesType](#)
- typedef std::string [FilenameType](#)

## Public Member Functions

- [Directory](#) ()=default
- [~Directory](#) ()=default
- [FilenamesType](#) const & [GetDirectories](#) () const  
*Return the Directories traversed.*
- [FilenamesType](#) const & [GetFilenames](#) () const  
*Set/Get the file names within the directory.*
- [FilenameType](#) const & [GetToplevel](#) () const  
*Get the name of the toplevel directory.*
- unsigned int [Load](#) ([FilenameType](#) const &name, bool recursive=false)
- void [Print](#) (std::ostream &os=std::cout) const  
*Print.*

## Protected Member Functions

- unsigned int [Explore](#) ([FilenameType](#) const &name, bool recursive)  
*Return number of file found when 'recursive'ly exploring directory *name**

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Directory](#) &d)

### 10.92.1 Detailed Description

Class for manipulation directories.

#### Note

This implementation provide a cross platform implementation for manipulating directories: basically traversing directories and harvesting files

will not take into account unix type hidden file recursive option will not look into UNIX type hidden directory (those starting with a '.')

Since python or C# provide there own equivalent implementation, in which case [gdcm::Directory](#) does not make much sense.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [DecompressImageMultiframe.cs](#), [DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [GenerateDICOMDIR.cs](#), [GenerateRTSTRUCT.cxx](#), [ReadUTF8QtDir.cxx](#), [ScanDirectory.cs](#), [SortImage.cxx](#), [StandardizeFiles.cs](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), [reslicesphere.cxx](#), and [threadgdcm.cxx](#).

## 10.92.2 Member Typedef Documentation

### 10.92.2.1 FilenamesType

```
typedef std::vector<FilenameType> gdcm::Directory::FilenamesType
```

#### Examples

[DiscriminateVolume.cxx](#).

### 10.92.2.2 FilenameType

```
typedef std::string gdcm::Directory::FilenameType
```

## 10.92.3 Constructor & Destructor Documentation

### 10.92.3.1 Directory()

```
gdcm::Directory::Directory ( ) [default]
```

### 10.92.3.2 ~Directory()

```
gdcm::Directory::~~Directory ( ) [default]
```

## 10.92.4 Member Function Documentation

#### 10.92.4.1 Explore()

```
unsigned int gdcM::Directory::Explore (
    FilenameType const & name,
    bool recursive ) [protected]
```

Return number of file found when 'recursive'ly exploring directory name

#### 10.92.4.2 GetDirectories()

```
FilenameType const & gdcM::Directory::GetDirectories ( ) const [inline]
```

Return the Directories traversed.

#### 10.92.4.3 GetFileNames()

```
FilenameType const & gdcM::Directory::GetFileNames ( ) const [inline]
```

Set/Get the file names within the directory.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [DecompressImageMultiframe.cs](#), [DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [GenerateDICOMDIR.cs](#), [GenerateRTSTRUCT.cxx](#), [ReadUTF8QtDir.cxx](#), [ScanDirectory.cs](#), [SortImage.cxx](#), [StandardizeFiles.cs](#), [VolumeSorter.cxx](#), [gdcMorthoplanes.cxx](#), [reslicesphere.cxx](#), and [threadgdcM.cxx](#).

#### 10.92.4.4 GetToplevel()

```
FilenameType const & gdcM::Directory::GetToplevel ( ) const [inline]
```

Get the name of the toplevel directory.



#### 10.92.4.5 Load()

```
unsigned int gdcmm::Directory::Load (
    FilenameType const & name,
    bool recursive = false )
```

construct a list of filenames and subdirectory beneath directory: name

##### Warning

: hidden file and hidden directory are not loaded.

##### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [DecompressImageMultiframe.cs](#), [DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [GenerateDICOmdir.cs](#), [GenerateRTSTRUCT.cxx](#), [ReadUTF8QtDir.cxx](#), [ScanDirectory.cs](#), [SortImage.cxx](#), [StandardizeFiles.cs](#), [VolumeSorter.cxx](#), [gdcmmorthoplanes.cxx](#), [reslicesphere.cxx](#), and [threadgdcmm.cxx](#).

#### 10.92.4.6 Print()

```
void gdcmm::Directory::Print (
    std::ostream & os = std::cout ) const
```

Print.

##### Examples

[SortImage.cxx](#).

### 10.92.5 Friends And Related Function Documentation

#### 10.92.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Directory & d ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmDirectory.h](#)

## 10.93 gdcm::DirectoryHelper Class Reference

[DirectoryHelper](#).

```
#include <gdcmDirectoryHelper.h>
```

### Static Public Member Functions

- static [Directory::FilenamesType](#) [GetCTImageSeriesUIDs](#) (const std::string &inDirectory)
- static [Directory::FilenamesType](#) [GetFileNamesFromSeriesUIDs](#) (const std::string &inDirectory, const std::string &inSeriesUID)
- static std::string [GetFrameOfReference](#) (const std::vector< [DataSet](#) > &inDS)
- static [Directory::FilenamesType](#) [GetMRImageSeriesUIDs](#) (const std::string &inDirectory)
- static [Directory::FilenamesType](#) [GetRTStructSeriesUIDs](#) (const std::string &inDirectory)
- static [Directory::FilenamesType](#) [GetSeriesUIDsBySOPClassUID](#) (const std::string &inDirectory, const std::string &inSOPClassUID)
- static std::string [GetSOPClassUID](#) (const std::vector< [DataSet](#) > &inDS)
- static std::string [GetStringValueFromTag](#) (const [Tag](#) &t, const [DataSet](#) &ds)
- static std::vector< [DataSet](#) > [LoadImageFromFiles](#) (const std::string &inDirectory, const std::string &inSeriesUID)
- static std::string [RetrieveSOPInstanceUIDFromIndex](#) (int inIndex, const std::vector< [DataSet](#) > &inDS)
- static std::string [RetrieveSOPInstanceUIDFromZPosition](#) (double inZPos, const std::vector< [DataSet](#) > &inDS)

### 10.93.1 Detailed Description

[DirectoryHelper](#).

this class is designed to help mitigate some of the commonly performed operations on directories. namely: 1) the ability to determine the number of series in a directory by what type of series is present 2) the ability to find all ct series in a directory 3) the ability to find all mr series in a directory 4) to load a set of DataSets from a series that's already been sorted by the IPP sorter 5) For rtstruct stuff, you need to know the sopinstanceuid of each z plane, so there's a retrieval function for that 6) then a few other functions for rtstruct writeouts

### 10.93.2 Member Function Documentation

#### 10.93.2.1 GetCTImageSeriesUIDs()

```
static Directory::FilenamesType gdcm::DirectoryHelper::GetCTImageSeriesUIDs (
    const std::string & inDirectory ) [static]
```

### 10.93.2.2 GetFileNamesFromSeriesUIDs()

```
static Directory::FileNamesType gdcm::DirectoryHelper::GetFileNamesFromSeriesUIDs (
    const std::string & inDirectory,
    const std::string & inSeriesUID ) [static]
```

### 10.93.2.3 GetFrameOfReference()

```
static std::string gdcm::DirectoryHelper::GetFrameOfReference (
    const std::vector< DataSet > & inDS ) [static]
```

### 10.93.2.4 GetMRImageSeriesUIDs()

```
static Directory::FileNamesType gdcm::DirectoryHelper::GetMRImageSeriesUIDs (
    const std::string & inDirectory ) [static]
```

### 10.93.2.5 GetRTStructSeriesUIDs()

```
static Directory::FileNamesType gdcm::DirectoryHelper::GetRTStructSeriesUIDs (
    const std::string & inDirectory ) [static]
```

### 10.93.2.6 GetSeriesUIDsBySOPClassUID()

```
static Directory::FileNamesType gdcm::DirectoryHelper::GetSeriesUIDsBySOPClassUID (
    const std::string & inDirectory,
    const std::string & inSOPClassUID ) [static]
```

### 10.93.2.7 GetSOPClassUID()

```
static std::string gdcm::DirectoryHelper::GetSOPClassUID (
    const std::vector< DataSet > & inDS ) [static]
```

### 10.93.2.8 GetStringValueFromTag()

```
static std::string gdcM::DirectoryHelper::GetStringValueFromTag (
    const Tag & t,
    const DataSet & ds ) [static]
```

### 10.93.2.9 LoadImageFromFiles()

```
static std::vector< DataSet > gdcM::DirectoryHelper::LoadImageFromFiles (
    const std::string & inDirectory,
    const std::string & inSeriesUID ) [static]
```

### 10.93.2.10 RetrieveSOPInstanceUIDFromIndex()

```
static std::string gdcM::DirectoryHelper::RetrieveSOPInstanceUIDFromIndex (
    int inIndex,
    const std::vector< DataSet > & inDS ) [static]
```

### 10.93.2.11 RetrieveSOPInstanceUIDFromZPosition()

```
static std::string gdcM::DirectoryHelper::RetrieveSOPInstanceUIDFromZPosition (
    double inZPos,
    const std::vector< DataSet > & inDS ) [static]
```

The documentation for this class was generated from the following file:

- [gdcMDirectoryHelper.h](#)

## 10.94 gdcM::DPath Class Reference

class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation [https://groups.google.com/g/comp.↵ protocols.dicom/c/IyIH0IOBMPA](https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA)

```
#include <gdcMDPath.h>
```

## Public Member Functions

- [DPath](#) ()
- [~DPath](#) ()
- bool [ConstructFromString](#) (const char \*path)
- bool [Match](#) ([DPath](#) const &other) const  
*Return whether or not 'other' match the template [DPath](#).*
- bool [operator<](#) (const [DPath](#) &rhs) const
- void [Print](#) (std::ostream &) const

## Static Public Member Functions

- static bool [IsValid](#) (const char \*path)  
*Return if path is valid or not.*

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [DPath](#) &\_val)

### 10.94.1 Detailed Description

class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation [https://groups.google.com/g/comp.↵protocols.dicom/c/IyIH0IOBMPA](https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA)

#### Examples

[Cleaner.cs](#).

### 10.94.2 Constructor & Destructor Documentation

#### 10.94.2.1 DPath()

```
gdcm::DPath::DPath ( )
```

#### 10.94.2.2 ~DPath()

```
gdcm::DPath::~~DPath ( )
```

### 10.94.3 Member Function Documentation

#### 10.94.3.1 ConstructFromString()

```
bool gdcm::DPath::ConstructFromString (
    const char * path )
```

##### Examples

[Cleaner.cs](#).

#### 10.94.3.2 IsValid()

```
static bool gdcm::DPath::IsValid (
    const char * path ) [static]
```

Return if path is valid or not.

#### 10.94.3.3 Match()

```
bool gdcm::DPath::Match (
    DPath const & other ) const
```

Return whether or not 'other' match the template [DPath](#).

#### 10.94.3.4 operator<()

```
bool gdcm::DPath::operator< (
    const DPath & rhs ) const
```

#### 10.94.3.5 Print()

```
void gdcm::DPath::Print (
    std::ostream & ) const
```

## 10.94.4 Friends And Related Function Documentation

### 10.94.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const DPath & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmDPath.h](#)

## 10.95 gdcm::DummyValueGenerator Class Reference

Class for generating dummy value.

```
#include <gdcmDummyValueGenerator.h>
```

### Static Public Member Functions

- static const char \* [Generate](#) (const char \*input)

### 10.95.1 Detailed Description

Class for generating dummy value.

See also

[Anonymizer](#)

### 10.95.2 Member Function Documentation

### 10.95.2.1 Generate()

```
static const char * gdcm::DummyValueGenerator::Generate (
    const char * input ) [static]
```

Generate a dummy value from an input value. This is guarantee to always return the same output value when input is identical. Return an array of bytes that can be used for anonymization purpose, return NULL on error NOT THREAD SAFE

The documentation for this class was generated from the following file:

- [gdcmDummyValueGenerator.h](#)

## 10.96 gdcm::Dumper Class Reference

[Codec](#) class.

```
#include <gdcmDumper.h>
```

Inheritance diagram for gdcm::Dumper:

Collaboration diagram for gdcm::Dumper:

### Public Member Functions

- [Dumper](#) ()
- [~Dumper](#) ()=default

### Additional Inherited Members

#### 10.96.1 Detailed Description

[Codec](#) class.

#### Note

Use it to simply dump value read from the file. No interpretation is done. But it is real fast ! Almost no overhead

#### 10.96.2 Constructor & Destructor Documentation



### 10.96.2.1 Dumper()

```
gdcm::Dumper::Dumper ( ) [inline]
```

### 10.96.2.2 ~Dumper()

```
gdcm::Dumper::~~Dumper ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmDumper.h](#)

## 10.97 gdcm::Element< TVR, TVM > Class Template Reference

[Element](#) class.

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, TVM >:

Collaboration diagram for gdcm::Element< TVR, TVM >:

### Public Types

- typedef [VRToType](#)< TVR >::Type [Type](#)

### Public Member Functions

- [DataElement](#) [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::Type & [GetValue](#) (unsigned int idx=0) const
- const [VRToType](#)< TVR >::Type \* [GetValues](#) () const
- [VRToType](#)< TVR >::Type [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) ([Value](#) const &v)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetValue](#) (typename [VRToType](#)< TVR >::Type v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const

## Static Public Member Functions

- static [VM GetVM](#) ()
- static [VR GetVR](#) ()

## Public Attributes

- [VRToType](#)< TVR >::Type [Internal](#) [[VMToLength](#)< TVM >::Length]

## Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

### 10.97.1 Detailed Description

```
template<long long TVR, int TVM>
class gdcm::Element< TVR, TVM >
```

[Element](#) class.

#### Note

TODO

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GetSubSequenceData.cxx](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

### 10.97.2 Member Typedef Documentation

#### 10.97.2.1 Type

```
template<long long TVR, int TVM>
typedef VRToType<TVR>::Type gdcm::Element< TVR, TVM >::Type
```

### 10.97.3 Member Function Documentation

### 10.97.3.1 GetAsDataElement()

```
template<long long TVR, int TVM>
DataElement gdcm::Element< TVR, TVM >::GetAsDataElement ( ) const [inline]
```

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), and [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#).

References [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), and [gdcm::DataElement::SetVR\(\)](#).

### 10.97.3.2 GetLength()

```
template<long long TVR, int TVM>
unsigned long gdcm::Element< TVR, TVM >::GetLength ( ) const [inline]
```

#### Examples

[DumpGEMSMovieGroup.cxx](#).

### 10.97.3.3 GetValue() [1/2]

```
template<long long TVR, int TVM>
VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0 ) [inline]
```

### 10.97.3.4 GetValue() [2/2]

```
template<long long TVR, int TVM>
const VRToType< TVR >::Type & gdcm::Element< TVR, TVM >::GetValue (
    unsigned int idx = 0 ) const [inline]
```

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [GetSubSequenceData.cxx](#), and [csa2img.cxx](#).

### 10.97.3.5 GetValues()

```
template<long long TVR, int TVM>
const VRToType< TVR >::Type * gdcM::Element< TVR, TVM >::GetValues ( ) const [inline]
```

### 10.97.3.6 GetVM()

```
template<long long TVR, int TVM>
static VM gdcM::Element< TVR, TVM >::GetVM ( ) [inline], [static]
```

### 10.97.3.7 GetVR()

```
template<long long TVR, int TVM>
static VR gdcM::Element< TVR, TVM >::GetVR ( ) [inline], [static]
```

### 10.97.3.8 operator[]()

```
template<long long TVR, int TVM>
VRToType< TVR >::Type gdcM::Element< TVR, TVM >::operator[] (
    unsigned int idx ) const [inline]
```

### 10.97.3.9 Print()

```
template<long long TVR, int TVM>
void gdcM::Element< TVR, TVM >::Print (
    std::ostream & _os ) const [inline]
```

### Examples

[DumpGEMSMovieGroup.cxx](#).

### 10.97.3.10 Read()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Read (
    std::istream & _is ) [inline]
```

### 10.97.3.11 Set()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::Set (
    Value const & v ) [inline]
```

#### Examples

[csa2img.cxx](#).

References [gdcm::ByteValue::GetLength\(\)](#), and [gdcm::ByteValue::GetPointer\(\)](#).

### 10.97.3.12 SetFromDataElement()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetFromDataElement (
    DataElement< TVR, TVM > const & de ) [inline]
```

#### Examples

[DumpADAC.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [GetSubSequenceData.cxx](#),  
and [iU22tomultisc.cxx](#).

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetValue\(\)](#), and [gdcm::DataElement::GetVR\(\)](#).

### 10.97.3.13 SetNoSwap()

```
template<long long TVR, int TVM>
void gdcm::Element< TVR, TVM >::SetNoSwap (
    Value const & v ) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), and [gdcm::ByteValue::GetPointer\(\)](#).

### 10.97.3.14 SetValue()

```
template<long long TVR, int TVM>
void gdcmm::Element< TVR, TVM >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0 ) [inline]
```

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), and [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#).

### 10.97.3.15 Write()

```
template<long long TVR, int TVM>
void gdcmm::Element< TVR, TVM >::Write (
    std::ostream & _os ) const [inline]
```

## 10.97.4 Member Data Documentation

### 10.97.4.1 Internal

```
template<long long TVR, int TVM>
VRToType<TVR>::Type gdcmm::Element< TVR, TVM >::Internal[VMToLength< TVM >::Length]
```

The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)

## 10.98 gdcmm::Element< TVR, VM::VM1\_2 > Class Template Reference

```
#include <gdcmmElement.h>
```

Inheritance diagram for gdcmm::Element< TVR, VM::VM1\_2 >:

Collaboration diagram for gdcmm::Element< TVR, VM::VM1\_2 >:

### Public Types

- typedef [Element](#)< TVR, [VM::VM1\\_n](#) > [Parent](#)

## Public Member Functions

- void [SetLength](#) (int len)

## Additional Inherited Members

### 10.98.1 Member Typedef Documentation

#### 10.98.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM1_2 >::Parent
```

### 10.98.2 Member Function Documentation

#### 10.98.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_2 >::SetLength (
    int len ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.99 gdcm::Element< TVR, VM::VM1\_n > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for `gdcm::Element< TVR, VM::VM1_n >`:

## Public Types

- typedef [VRToType](#)< TVR >::Type [Type](#)

## Public Member Functions

- [Element](#) ()
- [Element](#) (const [Element](#) &\_val)
- [~Element](#) ()
- [DataElement](#) [GetAsDataElement](#) () const
- unsigned long [GetLength](#) () const
- [VRToType](#)< TVR >::[Type](#) & [GetValue](#) (unsigned int idx=0)
- const [VRToType](#)< TVR >::[Type](#) & [GetValue](#) (unsigned int idx=0) const
- [Element](#) & [operator=](#) (const [Element](#) &\_val)
- [VRToType](#)< TVR >::[Type](#) [operator\[\]](#) (unsigned int idx) const
- void [Print](#) (std::ostream &\_os) const
- void [Read](#) (std::istream &\_is)
- void [Set](#) ([Value](#) const &v)
- void [SetArray](#) (const [Type](#) \*array, unsigned long len, bool save=false)
- void [SetFromDataElement](#) ([DataElement](#) const &de)
- void [SetLength](#) (unsigned long len)
- void [SetValue](#) (typename [VRToType](#)< TVR >::[Type](#) v, unsigned int idx=0)
- void [Write](#) (std::ostream &\_os) const
- void [WriteASCII](#) (std::ostream &os) const

## Static Public Member Functions

- static [VM](#) [GetVM](#) ()
- static [VR](#) [GetVR](#) ()

## Protected Member Functions

- void [SetNoSwap](#) ([Value](#) const &v)

## 10.99.1 Member Typedef Documentation

### 10.99.1.1 Type

```
template<long long TVR>
typedef VRToType<TVR>::Type gdcmm::Element< TVR, VM::VM1\_n >::Type
```

## 10.99.2 Constructor & Destructor Documentation



### 10.99.2.1 Element() [1/2]

```
template<long long TVR>
gdcm::Element< TVR, VM::VM1_n >::Element ( ) [inline], [explicit]
```

### 10.99.2.2 ~Element()

```
template<long long TVR>
gdcm::Element< TVR, VM::VM1_n >::~~Element ( ) [inline]
```

### 10.99.2.3 Element() [2/2]

```
template<long long TVR>
gdcm::Element< TVR, VM::VM1_n >::Element (
    const Element< TVR, VM::VM1_n > & _val ) [inline]
```

## 10.99.3 Member Function Documentation

### 10.99.3.1 GetAsDataElement()

```
template<long long TVR>
DataElement gdcm::Element< TVR, VM::VM1_n >::GetAsDataElement ( ) const [inline]
```

References [gdcm::DataElement::GetVR\(\)](#), [gdcm::DataElement::SetByteValue\(\)](#), and [gdcm::DataElement::SetVR\(\)](#).

### 10.99.3.2 GetLength()

```
template<long long TVR>
unsigned long gdcm::Element< TVR, VM::VM1_n >::GetLength ( ) const [inline]
```

**10.99.3.3 GetValue() [1/2]**

```
template<long long TVR>
VRToType< TVR >::Type & gdcm::Element< TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0 ) [inline]
```

**10.99.3.4 GetValue() [2/2]**

```
template<long long TVR>
const VRToType< TVR >::Type & gdcm::Element< TVR, VM::VM1_n >::GetValue (
    unsigned int idx = 0 ) const [inline]
```

**10.99.3.5 GetVM()**

```
template<long long TVR>
static VM gdcm::Element< TVR, VM::VM1_n >::GetVM ( ) [inline], [static]
```

**10.99.3.6 GetVR()**

```
template<long long TVR>
static VR gdcm::Element< TVR, VM::VM1_n >::GetVR ( ) [inline], [static]
```

**10.99.3.7 operator=()**

```
template<long long TVR>
Element & gdcm::Element< TVR, VM::VM1_n >::operator= (
    const Element< TVR, VM::VM1_n > & _val ) [inline]
```

**10.99.3.8 operator[]()**

```
template<long long TVR>
VRToType< TVR >::Type gdcm::Element< TVR, VM::VM1_n >::operator[] (
    unsigned int idx ) const [inline]
```

### 10.99.3.9 Print()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Print (
    std::ostream & _os ) const [inline]
```

### 10.99.3.10 Read()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Read (
    std::istream & _is ) [inline]
```

### 10.99.3.11 Set()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Set (
    Value const & v ) [inline]
```

References [gdcm::ByteValue::GetLength\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), [gdcm::ByteValue::GetVoidPointer\(\)](#), and [gdcm::VRBINARY](#).

### 10.99.3.12 SetArray()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetArray (
    const Type * array,
    unsigned long len,
    bool save = false ) [inline]
```

### 10.99.3.13 SetFromDataElement()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetFromDataElement (
    DataElement< TVR, VM::VM1_n > const & de ) [inline]
```

References [gdcm::DataElement::GetByteValue\(\)](#), [gdcm::DataElement::GetValue\(\)](#), and [gdcm::DataElement::GetVR\(\)](#).

#### 10.99.3.14 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetLength (
    unsigned long len ) [inline]
```

#### 10.99.3.15 SetNoSwap()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetNoSwap (
    Value const & v ) [inline], [protected]
```

References [gdcm::ByteValue::GetLength\(\)](#), [gdcm::ByteValue::GetPointer\(\)](#), and [gdcm::VRBINARY](#).

#### 10.99.3.16 SetValue()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::SetValue (
    typename VRToType< TVR >::Type v,
    unsigned int idx = 0 ) [inline]
```

#### 10.99.3.17 Write()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::Write (
    std::ostream & _os ) const [inline]
```

#### 10.99.3.18 WriteASCII()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM1_n >::WriteASCII (
    std::ostream & os ) const [inline]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.100 gdcm::Element< TVR, VM::VM2\_2n > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM2\_2n >:

Collaboration diagram for gdcm::Element< TVR, VM::VM2\_2n >:

### Public Types

- typedef [Element](#)< TVR, [VM::VM2\\_n](#) > [Parent](#)

### Public Member Functions

- void [SetLength](#) (int len)

### Additional Inherited Members

#### 10.100.1 Member Typedef Documentation

##### 10.100.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM2\_n> gdcm::Element< TVR, VM::VM2\_2n >::Parent
```

#### 10.100.2 Member Function Documentation

##### 10.100.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM2\_2n >::SetLength (
    int len ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.101 `gdcmm::Element< TVR, VM::VM2_n >` Class Template Reference

```
#include <gdcmmElement.h>
```

Inheritance diagram for `gdcmm::Element< TVR, VM::VM2_n >`:

Collaboration diagram for `gdcmm::Element< TVR, VM::VM2_n >`:

### Public Types

- typedef [Element< TVR, VM::VM1\\_n >](#) [Parent](#)

### Public Member Functions

- void [SetLength](#) (int len)

### Additional Inherited Members

#### 10.101.1 Member Typedef Documentation

##### 10.101.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1\_n> gdcmm::Element< TVR, VM::VM2\_n >::Parent
```

#### 10.101.2 Member Function Documentation

##### 10.101.2.1 SetLength()

```
template<long long TVR>
void gdcmm::Element< TVR, VM::VM2\_n >::SetLength (
    int len ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)

## 10.102 gdcm::Element< TVR, VM::VM3\_3n > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM3\_3n >:

Collaboration diagram for gdcm::Element< TVR, VM::VM3\_3n >:

### Public Types

- typedef [Element](#)< TVR, [VM::VM3\\_n](#) > [Parent](#)

### Public Member Functions

- void [SetLength](#) (int len)

### Additional Inherited Members

#### 10.102.1 Member Typedef Documentation

##### 10.102.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM3\_n> gdcm::Element< TVR, VM::VM3\_3n >::Parent
```

#### 10.102.2 Member Function Documentation

##### 10.102.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3\_3n >::SetLength (
    int len ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.103 `gdcm::Element< TVR, VM::VM3_4 >` Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for `gdcm::Element< TVR, VM::VM3_4 >`:

Collaboration diagram for `gdcm::Element< TVR, VM::VM3_4 >`:

### Public Types

- typedef `Element< TVR, VM::VM1_n >` `Parent`

### Public Member Functions

- void `SetLength` (int len)

### Additional Inherited Members

## 10.103.1 Member Typedef Documentation

### 10.103.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1_n> gdcm::Element< TVR, VM::VM3_4 >::Parent
```

## 10.103.2 Member Function Documentation

### 10.103.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3_4 >::SetLength (
    int len ) [inline]
```

The documentation for this class was generated from the following file:

- `gdcmElement.h`



## 10.104 gdcm::Element< TVR, VM::VM3\_n > Class Template Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< TVR, VM::VM3\_n >:

Collaboration diagram for gdcm::Element< TVR, VM::VM3\_n >:

### Public Types

- typedef [Element](#)< TVR, [VM::VM1\\_n](#) > [Parent](#)

### Public Member Functions

- void [SetLength](#) (int len)

### Additional Inherited Members

#### 10.104.1 Member Typedef Documentation

##### 10.104.1.1 Parent

```
template<long long TVR>
typedef Element<TVR, VM::VM1\_n> gdcm::Element< TVR, VM::VM3\_n >::Parent
```

#### 10.104.2 Member Function Documentation

##### 10.104.2.1 SetLength()

```
template<long long TVR>
void gdcm::Element< TVR, VM::VM3\_n >::SetLength (
    int len ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.105 `gdcmm::Element< VR::AS, VM::VM5 >` Class Reference

```
#include <gdcmElement.h>
```

### Public Member Functions

- unsigned long `GetLength` () const
- void `Print` (std::ostream &\_os) const

### Public Attributes

- char `Internal` [`VMToLength< VM::VM5 >::Length` \*sizeof(`VRToType< VR::AS >::Type`)]

### 10.105.1 Member Function Documentation

#### 10.105.1.1 `GetLength()`

```
unsigned long gdcmm::Element< VR::AS, VM::VM5 >::GetLength ( ) const [inline]
```

#### 10.105.1.2 `Print()`

```
void gdcmm::Element< VR::AS, VM::VM5 >::Print (
    std::ostream &_os ) const [inline]
```

### 10.105.2 Member Data Documentation

#### 10.105.2.1 `Internal`

```
char gdcmm::Element< VR::AS, VM::VM5 >::Internal[VMToLength< VM::VM5 >::Length *sizeof(VRToType<
VR::AS >::Type)]
```

The documentation for this class was generated from the following file:

- `gdcmElement.h`

## 10.106 gdcm::Element< VR::OB, VM::VM1 > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< VR::OB, VM::VM1 >:

Collaboration diagram for gdcm::Element< VR::OB, VM::VM1 >:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.107 gdcm::Element< VR::OW, VM::VM1 > Class Reference

```
#include <gdcmElement.h>
```

Inheritance diagram for gdcm::Element< VR::OW, VM::VM1 >:

Collaboration diagram for gdcm::Element< VR::OW, VM::VM1 >:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.108 gdcm::ElementDisableCombinations< TVR, TVM > Class Template Reference

A class which is used to produce compile errors for an invalid combination of template parameters.

```
#include <gdcmElement.h>
```

### 10.108.1 Detailed Description

```
template<long long TVR, int TVM>
class gdcm::ElementDisableCombinations< TVR, TVM >
```

A class which is used to produce compile errors for an invalid combination of template parameters.

Invalid combinations have specialized declarations with no definition.

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

### 10.109 gdcm::ElementDisableCombinations< VR::OB, VM::VM1\_n > Class Reference

```
#include <gdcmElement.h>
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

### 10.110 gdcm::ElementDisableCombinations< VR::OW, VM::VM1\_n > Class Reference

```
#include <gdcmElement.h>
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

### 10.111 gdcm::EmptyMaskGenerator Class Reference

[EmptyMaskGenerator](#) Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.

```
#include <gdcmEmptyMaskGenerator.h>
```

## Public Types

- enum [SOPClassUIDMode](#) {  
    [UseOriginalSOPClassUID](#) = 0 ,  
    [UseGrayscaleSecondaryImageStorage](#) }

## Public Member Functions

- [EmptyMaskGenerator](#) ()
- [~EmptyMaskGenerator](#) ()
- bool [Execute](#) ()  
    *Main loop.*
- void [SetInputDirectory](#) (const char \*dirname)  
    *Specify input directory.*
- void [SetOutputDirectory](#) (const char \*dirname)  
    *Specify output directory.*
- void [SetSOPClassUIDMode](#) ([SOPClassUIDMode](#) mode)

### 10.111.1 Detailed Description

[EmptyMaskGenerator](#) Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.

The class allow two mode of operations:

- [UseOriginalSOPClassUID](#)
- [UseGrayscaleSecondaryImageStorage](#)

[UseOriginalSOPClassUID](#) is the mode where original attributes are copied from the original DICOM instance.

[UseGrayscaleSecondaryImageStorage](#) is the mode where attributes are generated so as to create a Multiframe↔GrayscaleByteSecondaryCaptureImageStorage (MultiframeGrayscaleWordSecondaryCaptureImageStorage) instance.

In both mode:

- the [Study](#) references (StudyInstanceUID and StudyID) are preserved.
- the PatientID reference is preserved.
- the [Image Type](#) attribute will be setup so that the fourth element is set to 'MASK'.
- a new [Series](#) Instance UID is generated. It is thus required to run the process over all files using the same input [Series](#) Instance UID so that a proper mapping from the old [Series](#) UID is done to the new one. Since a new [Series](#) Instance UID is generated, there is no sense to preserve the original Frame of Reference UID, although it would have made sense here.

## Examples

[EmptyMask.cxx](#).

## 10.111.2 Member Enumeration Documentation

### 10.111.2.1 SOPClassUIDMode

enum `gdcm::EmptyMaskGenerator::SOPClassUIDMode`

Enumerator

UseOriginalSOPClassUID	
UseGrayscaleSecondaryImageStorage	

## 10.111.3 Constructor & Destructor Documentation

### 10.111.3.1 EmptyMaskGenerator()

`gdcm::EmptyMaskGenerator::EmptyMaskGenerator ( )`

### 10.111.3.2 ~EmptyMaskGenerator()

`gdcm::EmptyMaskGenerator::~~EmptyMaskGenerator ( )`

## 10.111.4 Member Function Documentation

### 10.111.4.1 Execute()

`bool gdcm::EmptyMaskGenerator::Execute ( )`

Main loop.

Examples

[EmptyMask.cxx](#).

#### 10.111.4.2 SetInputDirectory()

```
void gdcm::EmptyMaskGenerator::SetInputDirectory (
    const char * dirname )
```

Specify input directory.

##### Examples

[EmptyMask.cxx](#).

#### 10.111.4.3 SetOutputDirectory()

```
void gdcm::EmptyMaskGenerator::SetOutputDirectory (
    const char * dirname )
```

Specify output directory.

##### Examples

[EmptyMask.cxx](#).

#### 10.111.4.4 SetSOPClassUIDMode()

```
void gdcm::EmptyMaskGenerator::SetSOPClassUIDMode (
    SOPClassUIDMode mode )
```

Select generation of SOP Class UID method: Default is UseOriginalSOPClassUID

##### Examples

[EmptyMask.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmEmptyMaskGenerator.h](#)

## 10.112 gdcm::EncapsulatedDocument Class Reference

[EncapsulatedDocument](#).

```
#include <gdcmEncapsulatedDocument.h>
```

## Public Member Functions

- [EncapsulatedDocument](#) ()=default

### 10.112.1 Detailed Description

[EncapsulatedDocument](#).

### 10.112.2 Constructor & Destructor Documentation

#### 10.112.2.1 EncapsulatedDocument()

```
gdcmm::EncapsulatedDocument::EncapsulatedDocument ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmmEncapsulatedDocument.h](#)

## 10.113 gdcmm::EncodingImplementation< T > Class Template Reference

[EncodingImplementation](#).

### 10.113.1 Detailed Description

```
template<long long T>
class gdcmm::EncodingImplementation< T >
```

[EncodingImplementation](#).

Note

TODO

The documentation for this class was generated from the following file:

- [gdcmmElement.h](#)



## 10.114 gdcm::EncodingImplementation< VR::VRASCII > Class Reference

```
#include <gdcmElement.h>
```

### Public Member Functions

- template<> void [Write](#) (const double \*data, unsigned long length, std::ostream &\_os)

### Static Public Member Functions

- template<typename T >  
static void [Read](#) (T \*data, unsigned long length, std::istream &\_is)
- template<typename T >  
static void [ReadComputeLength](#) (T \*data, unsigned int &length, std::istream &\_is)
- template<typename T >  
static void [ReadNoSwap](#) (T \*data, unsigned long length, std::istream &\_is)
- template<typename T >  
static void [Write](#) (const T \*data, unsigned long length, std::ostream &\_os)

### 10.114.1 Member Function Documentation

#### 10.114.1.1 Read()

```
template<typename T >  
static void gdcm::EncodingImplementation< VR::VRASCII >::Read (  
    T * data,  
    unsigned long length,  
    std::istream & _is ) [inline], [static]
```

#### 10.114.1.2 ReadComputeLength()

```
template<typename T >  
static void gdcm::EncodingImplementation< VR::VRASCII >::ReadComputeLength (  
    T * data,  
    unsigned int & length,  
    std::istream & _is ) [inline], [static]
```

References [gdcm::backslash\(\)](#).

### 10.114.1.3 ReadNoSwap()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRASCII >::ReadNoSwap (
    T * data,
    unsigned long length,
    std::istream & _is ) [inline], [static]
```

### 10.114.1.4 Write() [1/2]

```
template<>
void gdcm::EncodingImplementation< VR::VRASCII >::Write (
    const double * data,
    unsigned long length,
    std::ostream & _os ) [inline]
```

References [gdcm::x16printf\(\)](#).

### 10.114.1.5 Write() [2/2]

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRASCII >::Write (
    const T * data,
    unsigned long length,
    std::ostream & _os ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.115 gdcm::EncodingImplementation< VR::VRBINARY > Class Reference

```
#include <gdcmElement.h>
```

### Static Public Member Functions

- template<typename T >  
static void [Read](#) (T \*data, unsigned long length, std::istream &\_is)
- template<typename T >  
static void [ReadComputeLength](#) (T \*data, unsigned int &length, std::istream &\_is)
- template<typename T >  
static void [ReadNoSwap](#) (T \*data, unsigned long length, std::istream &\_is)
- template<typename T >  
static void [Write](#) (const T \*data, unsigned long length, std::ostream &\_os)

## 10.115.1 Member Function Documentation

### 10.115.1.1 Read()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::Read (
    T * data,
    unsigned long length,
    std::istream & _is ) [inline], [static]
```

### 10.115.1.2 ReadComputeLength()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::ReadComputeLength (
    T * data,
    unsigned int & length,
    std::istream & _is ) [inline], [static]
```

### 10.115.1.3 ReadNoSwap()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::ReadNoSwap (
    T * data,
    unsigned long length,
    std::istream & _is ) [inline], [static]
```

### 10.115.1.4 Write()

```
template<typename T >
static void gdcm::EncodingImplementation< VR::VRBINARY >::Write (
    const T * data,
    unsigned long length,
    std::ostream & _os ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmElement.h](#)

## 10.116 gdcm::EndEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::EndEvent:

Collaboration diagram for gdcm::EndEvent:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.117 gdcm::EnumeratedValues Class Reference

**Element.** A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

```
#include <gdcmEnumeratedValues.h>
```

### Public Member Functions

- [EnumeratedValues](#) ()=default

#### 10.117.1 Detailed Description

**Element.** A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

1. [Patient](#) Sex (0010, 0040) is an example of a Data [Element](#) having Enumerated Values. It is defined to have a [Value](#) that is either "M", "F", or "O" (see PS 3.3). No other [Value](#) shall be given to this Data [Element](#).
2. Future modifications of this standard may add to the set of allowed values for Data Elements with Enumerated Values. Such additions by themselves may or may not require a change in SOP Class [UIDs](#), depending on the semantics of the Data [Element](#).

#### 10.117.2 Constructor & Destructor Documentation

### 10.117.2.1 EnumeratedValues()

```
gdcm::EnumeratedValues::EnumeratedValues ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmEnumeratedValues.h](#)

## 10.118 gdcm::EquipmentManufacturer Class Reference

```
#include <gdcmEquipmentManufacturer.h>
```

### Public Types

- enum [Type](#) {  
    UNKNOWN = 0 ,  
    FUJI ,  
    GEMS ,  
    HITACHI ,  
    KODAK ,  
    MARCONI ,  
    PMS ,  
    SIEMENS ,  
    TOSHIBA ,  
    AGFA ,  
    SAMSUNG ,  
    UIH }

### Static Public Member Functions

- static [Type Compute](#) ([DataSet](#) const &ds)
- static const char \* [TypeToString](#) ([Type](#) type)

### 10.118.1 Detailed Description

The intent is for private tags handling. This class is not meant to handle all possible vendors in the world, simply those well known where we intend to read private tags afterwards (typically SIEMENS+CSA, GEMS+PDB ...)

### 10.118.2 Member Enumeration Documentation

#### 10.118.2.1 Type

```
enum gdcm::EquipmentManufacturer::Type
```

## Enumerator

UNKNOWN	
FUJI	
GEMS	
HITACHI	
KODAK	
MARCONI	
PMS	
SIEMENS	
TOSHIBA	
AGFA	
SAMSUNG	
UIH	

### 10.118.3 Member Function Documentation

#### 10.118.3.1 Compute()

```
static Type gdcM::EquipmentManufacturer::Compute (
    DataSet const & ds ) [static]
```

#### 10.118.3.2 TypeToString()

```
static const char * gdcM::EquipmentManufacturer::TypeToString (
    Type type ) [static]
```

The documentation for this class was generated from the following file:

- [gdcMEquipmentManufacturer.h](#)

## 10.119 gdcM::Event Class Reference

superclass for callback/observer methods

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::Event:

## Public Member Functions

- [Event](#) ()
- [Event](#) (const [Event](#) &)
- virtual [~Event](#) ()
- virtual bool [CheckEvent](#) (const [Event](#) \*) const =0
- virtual const char \* [GetEventName](#) () const =0
- virtual [Event](#) \* [MakeObject](#) () const =0
- void [operator=](#) (const [Event](#) &)=delete
- virtual void [Print](#) (std::ostream &os) const

### 10.119.1 Detailed Description

superclass for callback/observer methods

See also

[Command Subject](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 10.119.2 Constructor & Destructor Documentation

#### 10.119.2.1 [Event\(\)](#) [1/2]

```
gdcm::Event::Event ( )
```

#### 10.119.2.2 [~Event\(\)](#)

```
virtual gdcm::Event::~~Event ( ) [virtual]
```

#### 10.119.2.3 [Event\(\)](#) [2/2]

```
gdcm::Event::Event (
    const Event & )
```

### 10.119.3 Member Function Documentation

#### 10.119.3.1 CheckEvent()

```
virtual bool gdcm::Event::CheckEvent (
    const Event * ) const [pure virtual]
```

Check if given event matches or derives from this event.

#### 10.119.3.2 GetEventName()

```
virtual const char * gdcm::Event::GetEventName ( ) const [pure virtual]
```

Return the StringName associated with the event.

Implemented in [gdcm::DataEvent](#), [gdcm::FileNameEvent](#), [gdcm::ProgressEvent](#), [gdcm::DataSetEvent](#), and [gdcm::AnonymizeEvent](#).

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), and [ScanDirectory.cs](#).

#### 10.119.3.3 MakeObject()

```
virtual Event * gdcm::Event::MakeObject ( ) const [pure virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implemented in [gdcm::DataEvent](#), [gdcm::FileNameEvent](#), [gdcm::ProgressEvent](#), [gdcm::DataSetEvent](#), and [gdcm::AnonymizeEvent](#).

#### 10.119.3.4 operator=()

```
void gdcm::Event::operator= (
    const Event & ) [delete]
```



### 10.119.3.5 Print()

```
virtual void gdcm::Event::Print (
    std::ostream & os ) const [virtual]
```

Print [Event](#) information. This method can be overridden by specific [Event](#) subtypes. The default is to print out the type of the event.

Referenced by [gdcm::operator<<\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.120 gdcm::Exception Class Reference

[Exception](#).

```
#include <gdcmException.h>
```

Inheritance diagram for `gdcm::Exception`:

Collaboration diagram for `gdcm::Exception`:

### Public Member Functions

- [Exception](#) (const char \*desc="None", const char \*file=\_\_FILE\_\_, unsigned int lineNumber=\_\_LINE\_\_, const char \*func="")
- [~Exception](#) () override throw ()
- const char \* [GetDescription](#) () const  
*Return the Description.*
- const char \* [what](#) () const override throw ()  
*what implementation*

### 10.120.1 Detailed Description

[Exception](#).

Standard exception handling object.

#### Note

Its copy-constructor and assignment operator are generated by the compiler.

#### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

## 10.120.2 Constructor & Destructor Documentation

### 10.120.2.1 Exception()

```
gdcm::Exception::Exception (
    const char * desc = "None",
    const char * file = __FILE__,
    unsigned int lineNumber = __LINE__,
    const char * func = "" ) [inline], [explicit]
```

Explicit constructor, initializing the description and the text returned by [what\(\)](#).

#### Note

The last parameter is ignored for the time being. It may be used to specify the function where the exception was thrown.

### 10.120.2.2 ~Exception()

```
gdcm::Exception::~~Exception ( ) throw ( ) [inline], [override]
```

## 10.120.3 Member Function Documentation

### 10.120.3.1 GetDescription()

```
const char * gdcm::Exception::GetDescription ( ) const [inline]
```

Return the Description.

Referenced by [gdcm::SequenceOfItems::Read\(\)](#).

### 10.120.3.2 what()

```
const char * gdcm::Exception::what ( ) const throw ( )    [inline], [override]
```

what implementation

Referenced by [gdcm::SequenceOfFragments::ReadValue\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmException.h](#)

## 10.121 gdcm::ExitEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::ExitEvent:

Collaboration diagram for gdcm::ExitEvent:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.122 gdcm::ExplicitDataElement Class Reference

Class to read/write a [DataElement](#) as Explicit Data [Element](#).

```
#include <gdcmExplicitDataElement.h>
```

Inheritance diagram for gdcm::ExplicitDataElement:

Collaboration diagram for gdcm::ExplicitDataElement:

### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)
- template<typename TSwap >  
const std::ostream & [Write](#) (std::ostream &os) const

## Additional Inherited Members

### 10.122.1 Detailed Description

Class to read/write a [DataElement](#) as Explicit Data [Element](#).

#### Note

bla

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), and [ReadAndDumpDICOMDIR2.cxx](#).

### 10.122.2 Member Function Documentation

#### 10.122.2.1 GetLength()

```
VL gdcmm::ExplicitDataElement::GetLength ( ) const
```

#### 10.122.2.2 Read()

```
template<typename TSwap >  
std::istream & gdcmm::ExplicitDataElement::Read (  
    std::istream & is )
```

#### 10.122.2.3 ReadPreValue()

```
template<typename TSwap >  
std::istream & gdcmm::ExplicitDataElement::ReadPreValue (  
    std::istream & is )
```

#### 10.122.2.4 ReadValue()

```
template<typename TSwap >
std::istream & gdcm::ExplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true )
```

#### 10.122.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream & gdcm::ExplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length )
```

#### 10.122.2.6 Write()

```
template<typename TSwap >
const std::ostream & gdcm::ExplicitDataElement::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmExplicitDataElement.h](#)

## 10.123 gdcm::ExplicitImplicitDataElement Class Reference

Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

```
#include <gdcmExplicitImplicitDataElement.h>
```

Inheritance diagram for gdcm::ExplicitImplicitDataElement:

Collaboration diagram for gdcm::ExplicitImplicitDataElement:

### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)

## Additional Inherited Members

### 10.123.1 Detailed Description

Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

#### Note

This only happen for some Philips images Should I derive from [ExplicitDataElement](#) instead ? This is the class that is the closest the GDCM1.x parser. At each element we try first to read it as explicit, if this fails, then we try again as an implicit element.

### 10.123.2 Member Function Documentation

#### 10.123.2.1 GetLength()

```
VL gdcmm::ExplicitImplicitDataElement::GetLength ( ) const
```

#### 10.123.2.2 Read()

```
template<typename TSwap >  
std::istream & gdcmm::ExplicitImplicitDataElement::Read (  
    std::istream & is )
```

#### 10.123.2.3 ReadPreValue()

```
template<typename TSwap >  
std::istream & gdcmm::ExplicitImplicitDataElement::ReadPreValue (  
    std::istream & is )
```

#### 10.123.2.4 ReadValue()

```
template<typename TSwap >  
std::istream & gdcmm::ExplicitImplicitDataElement::ReadValue (  
    std::istream & is,  
    bool readvalues = true )
```

### 10.123.2.5 ReadWithLength()

```
template<typename TSwap >
std::istream & gdcm::ExplicitImplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmExplicitImplicitDataElement.h](#)

## 10.124 gdcm::Fiducials Class Reference

[Fiducials.](#)

```
#include <gdcmFiducials.h>
```

### Public Member Functions

- [Fiducials](#) ()=default

### 10.124.1 Detailed Description

[Fiducials.](#)

### 10.124.2 Constructor & Destructor Documentation

#### 10.124.2.1 Fiducials()

```
gdcm::Fiducials::Fiducials ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmFiducials.h](#)

## 10.125 gdcm::File Class Reference

a DICOM [File](#)

```
#include <gdcmFile.h>
```

Inheritance diagram for gdcm::File:

Collaboration diagram for gdcm::File:

### Public Member Functions

- [File](#) ()
- [~File](#) () override
- [DataSet](#) & [GetDataSet](#) ()  
*Get Data Set.*
- const [DataSet](#) & [GetDataSet](#) () const  
*Get Data Set.*
- [FileMetaInformation](#) & [GetHeader](#) ()  
*Get File Meta Information.*
- const [FileMetaInformation](#) & [GetHeader](#) () const  
*Get File Meta Information.*
- std::istream & [Read](#) (std::istream &is)  
*Read.*
- void [SetDataSet](#) (const [DataSet](#) &ds)  
*Set Data Set.*
- void [SetHeader](#) (const [FileMetaInformation](#) &fmi)  
*Set File Meta Information.*
- std::ostream const & [Write](#) (std::ostream &os) const  
*Write.*

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [File](#) &val)

### Additional Inherited Members

#### 10.125.1 Detailed Description

a DICOM [File](#)

See PS 3.10 [File](#): A [File](#) is an ordered string of zero or more bytes, where the first byte is at the beginning of the file and the last byte at the end of the [File](#). Files are identified by a unique [File](#) ID and may be written, read and/or deleted.



See also

[Reader Writer](#)

Examples

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpCSA.cs](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and [iU22tomultisc.cxx](#).

## 10.125.2 Constructor & Destructor Documentation

### 10.125.2.1 File()

```
gdcm::File::File ( )
```

### 10.125.2.2 ~File()

```
gdcm::File::~~File ( ) [override]
```

## 10.125.3 Member Function Documentation

### 10.125.3.1 GetDataSet() [1/2]

```
DataSet & gdcm::File::GetDataSet ( ) [inline]
```

Get Data Set.

**10.125.3.2 GetDataSet() [2/2]**

```
const DataSet & gdcm::File::GetDataSet ( ) const [inline]
```

Get Data Set.

**Examples**

[ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [SimplePrint.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

**10.125.3.3 GetHeader() [1/2]**

```
FileMetaInformation & gdcm::File::GetHeader ( ) [inline]
```

Get [File](#) Meta Information.

**10.125.3.4 GetHeader() [2/2]**

```
const FileMetaInformation & gdcm::File::GetHeader ( ) const [inline]
```

Get [File](#) Meta Information.

**Examples**

[CreateJPIPDataSet.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetJPEGSamplePrecision.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [StreamImageReaderTest.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.125.3.5 Read()

```
std::istream & gdcm::File::Read (
    std::istream & is )
```

Read.

### 10.125.3.6 SetDataSet()

```
void gdcm::File::SetDataSet (
    const DataSet & ds ) [inline]
```

Set Data Set.

### 10.125.3.7 SetHeader()

```
void gdcm::File::SetHeader (
    const FileMetaInformation & fmi ) [inline]
```

Set [File](#) Meta Information.

### 10.125.3.8 Write()

```
std::ostream const & gdcm::File::Write (
    std::ostream & os ) const
```

Write.

## 10.125.4 Friends And Related Function Documentation

### 10.125.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const File & val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmFile.h](#)

## 10.126 gdcm::FileAnonymizer Class Reference

[FileAnonymizer](#).

```
#include <gdcmFileAnonymizer.h>
```

Inheritance diagram for gdcm::FileAnonymizer:

Collaboration diagram for gdcm::FileAnonymizer:

### Public Member Functions

- [FileAnonymizer](#) ()
- [~FileAnonymizer](#) () override
- void [Empty](#) ([Tag](#) const &t)
- void [Remove](#) ([Tag](#) const &t)  
*remove a tag (even a SQ can be removed)*
- void [Replace](#) ([Tag](#) const &t, const char \*value\_data, [VL](#) const &vl)
- void [Replace](#) ([Tag](#) const &t, const char \*value\_str)
- void [SetInputFileName](#) (const char \*filename\_native)  
*Set input filename.*
- void [SetOutputFileName](#) (const char \*filename\_native)  
*Set output filename.*
- bool [Write](#) ()  
*Write the output file.*

### Additional Inherited Members

#### 10.126.1 Detailed Description

[FileAnonymizer](#).

This [Anonymizer](#) is a file-based [Anonymizer](#). It requires a valid DICOM file and will use the [Value](#) Length to skip over any information.

It will not load the DICOM dataset taken from [SetInputFileName\(\)](#) into memory and should consume much less memory than [Anonymizer](#).

#### Warning

: Each time you call [Replace\(\)](#) with a value. This value will be copied, and stored in memory. The behavior is not ideal for extremely large data (larger than memory size). This class is really meant to take a large DICOM input file and then only change some small attribute.

#### caveats:

- This class will NOT work with unordered attributes in a DICOM [File](#),
- This class does neither recompute nor update the Group Length element,
- This class currently does not update the [File](#) Meta Information header.
- Only strict inplace Replace operation is supported when input and output file are the same.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

## 10.126.2 Constructor & Destructor Documentation

### 10.126.2.1 FileAnonymizer()

```
gdcm::FileAnonymizer::FileAnonymizer ( )
```

### 10.126.2.2 ~FileAnonymizer()

```
gdcm::FileAnonymizer::~~FileAnonymizer ( ) [override]
```

## 10.126.3 Member Function Documentation

### 10.126.3.1 Empty()

```
void gdcm::FileAnonymizer::Empty (
    Tag const & t )
```

Make [Tag](#) t empty Warning: does not handle SQ element

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

### 10.126.3.2 Remove()

```
void gdcm::FileAnonymizer::Remove (
    Tag const & t )
```

remove a tag (even a SQ can be removed)

#### Examples

[FileAnonymize.cs](#).

### 10.126.3.3 Replace() [1/2]

```
void gdcM::FileAnonymizer::Replace (
    Tag const & t,
    const char * value_data,
    VL const & vl )
```

when the value contains \0, it is a good idea to specify the length. This function is required when dealing with VRBINARY tag

### 10.126.3.4 Replace() [2/2]

```
void gdcM::FileAnonymizer::Replace (
    Tag const & t,
    const char * value_str )
```

Replace tag with another value, if tag is not found it will be created: WARNING: this function can only execute if tag is a VRASCII WARNING: Do not ever try to write a value in a SQ Data [Element](#) !

#### Examples

[FileAnonymize.cs](#).

### 10.126.3.5 SetInputFileName()

```
void gdcM::FileAnonymizer::SetInputFileName (
    const char * filename_native )
```

Set input filename.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

### 10.126.3.6 SetOutputFileName()

```
void gdcM::FileAnonymizer::SetOutputFileName (
    const char * filename_native )
```

Set output filename.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

### 10.126.3.7 Write()

```
bool gdcm::FileAnonymizer::Write ( )
```

Write the output file.

#### Examples

[FileAnonymize.cs](#), and [MakeTemplate.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmFileAnonymizer.h](#)

## 10.127 gdcm::FileChangeTransferSyntax Class Reference

[FileChangeTransferSyntax](#).

```
#include <gdcmFileChangeTransferSyntax.h>
```

Inheritance diagram for gdcm::FileChangeTransferSyntax:

Collaboration diagram for gdcm::FileChangeTransferSyntax:

### Public Member Functions

- [FileChangeTransferSyntax](#) ()
- [~FileChangeTransferSyntax](#) () override
- bool [Change](#) ()  
*Change the transfer syntax.*
- [ImageCodec](#) \* [GetCodec](#) ()
- void [SetInputFileName](#) (const char \*filename\_native)  
*Set input filename (raw DICOM)*
- void [SetOutputFileName](#) (const char \*filename\_native)  
*Set output filename (target compressed DICOM)*
- void [SetTransferSyntax](#) ([TransferSyntax](#) const &ts)  
*Specify the Target Transfer Syntax.*

### Static Public Member Functions

- static [SmartPointer](#)< [FileChangeTransferSyntax](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

### 10.127.1 Detailed Description

[FileChangeTransferSyntax](#).

This class is a file-based (limited) replacement of the in-memory [ImageChangeTransferSyntax](#).

This class provide a file-based compression-only mechanism. It will take in an uncompressed DICOM image file (Pixel Data element). Then produced as output a compressed DICOM file (Transfer Syntax will be updated).

Currently it supports the following transfer syntax:

- JPEGLosslessProcess14\_1

Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 10.127.2 Constructor & Destructor Documentation

#### 10.127.2.1 FileChangeTransferSyntax()

```
gdcm::FileChangeTransferSyntax::FileChangeTransferSyntax ( )
```

#### 10.127.2.2 ~FileChangeTransferSyntax()

```
gdcm::FileChangeTransferSyntax::~~FileChangeTransferSyntax ( ) [override]
```

### 10.127.3 Member Function Documentation

#### 10.127.3.1 Change()

```
bool gdcm::FileChangeTransferSyntax::Change ( )
```

Change the transfer syntax.

Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).



### 10.127.3.2 GetCodec()

```
ImageCodec * gdcm::FileChangeTransferSyntax::GetCodec ( )
```

Retrieve the actual codec (valid after calling SetTransferSyntax) Only advanced users should call this function.

#### Examples

[FileChangeTSLossy.cs](#).

### 10.127.3.3 New()

```
static SmartPointer< FileChangeTransferSyntax > gdcm::FileChangeTransferSyntax::New ( ) [inline],  
[static]
```

for wrapped language: instantiate a reference counted object

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 10.127.3.4 SetInputFileName()

```
void gdcm::FileChangeTransferSyntax::SetInputFileName (   
    const char * filename_native )
```

Set input filename (raw DICOM)

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 10.127.3.5 SetOutputFileName()

```
void gdcm::FileChangeTransferSyntax::SetOutputFileName (   
    const char * filename_native )
```

Set output filename (target compressed DICOM)

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

### 10.127.3.6 SetTransferSyntax()

```
void gdcM::FileChangeTransferSyntax::SetTransferSyntax (
    TransferSyntax const & ts )
```

Specify the Target Transfer Syntax.

#### Examples

[FileChangeTS.cs](#), and [FileChangeTSLossy.cs](#).

The documentation for this class was generated from the following file:

- [gdcMFileChangeTransferSyntax.h](#)

## 10.128 gdcM::FileDecompressLookupTable Class Reference

[FileDecompressLookupTable](#) class.

```
#include <gdcMFileDecompressLookupTable.h>
```

Inheritance diagram for gdcM::FileDecompressLookupTable:

Collaboration diagram for gdcM::FileDecompressLookupTable:

### Public Member Functions

- [FileDecompressLookupTable](#) ()=default
- [~FileDecompressLookupTable](#) () override=default
- bool [Change](#) ()  
*Decompress.*
- [File](#) & [GetFile](#) ()
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const
- void [SetFile](#) (const [File](#) &f)  
*Set/Get File.*
- void [SetPixmap](#) ([Pixmap](#) const &img)

### Additional Inherited Members

#### 10.128.1 Detailed Description

[FileDecompressLookupTable](#) class.

It decompress the segmented LUT into linearized one (only PALETTE\_COLOR images) Output will be a [PhotometricInterpretation](#)=RGB image

## 10.128.2 Constructor & Destructor Documentation

### 10.128.2.1 FileDecompressLookupTable()

```
gdcm::FileDecompressLookupTable::FileDecompressLookupTable ( ) [default]
```

### 10.128.2.2 ~FileDecompressLookupTable()

```
gdcm::FileDecompressLookupTable::~~FileDecompressLookupTable ( ) [override], [default]
```

## 10.128.3 Member Function Documentation

### 10.128.3.1 Change()

```
bool gdcm::FileDecompressLookupTable::Change ( )
```

Decompress.

### 10.128.3.2 GetFile()

```
File & gdcm::FileDecompressLookupTable::GetFile ( ) [inline]
```

### 10.128.3.3 GetPixmap() [1/2]

```
Pixmap & gdcm::FileDecompressLookupTable::GetPixmap ( ) [inline]
```

### 10.128.3.4 GetPixmap() [2/2]

```
const Pixmap & gdcm::FileDecompressLookupTable::GetPixmap ( ) const [inline]
```

### 10.128.3.5 SetFile()

```
void gdcM::FileDecompressLookupTable::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

### 10.128.3.6 SetPixmap()

```
void gdcM::FileDecompressLookupTable::SetPixmap (
    Pixmap const & img ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcMFileDecompressLookupTable.h](#)

## 10.129 gdcM::FileDerivation Class Reference

[FileDerivation](#) class.

```
#include <gdcMFileDerivation.h>
```

### Public Member Functions

- [FileDerivation](#) ()
- [~FileDerivation](#) ()
- bool [AddReference](#) (const char \*referencedsopclassuid, const char \*referencedsopinstanceuid)
- bool [Derive](#) ()  
*Change.*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- void [SetAppendDerivationHistory](#) (bool b)
- void [SetDerivationCodeSequenceCodeValue](#) (unsigned int codevalue)  
*Specify the Derivation Code Sequence Code Value. Eg 113040.*
- void [SetDerivationDescription](#) (const char \*dd)  
*Specify the Derivation Description. Eg "lossy conversion".*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get File.*
- void [SetPurposeOfReferenceCodeSequenceCodeValue](#) (unsigned int codevalue)  
*Specify the Purpose Of Reference Code Value. Eg. 121320.*

## Protected Member Functions

- bool [AddDerivationDescription](#) ()
- bool [AddPurposeOfReferenceCodeSequence](#) (DataSet &ds)
- bool [AddSourceImageSequence](#) ()

### 10.129.1 Detailed Description

[FileDerivation](#) class.

See PS 3.16 - 2008 For the list of Code [Value](#) that can be used for in Derivation Code Sequence

URL: [http://medical.nema.org/medical/dicom/2008/08\\_16pu.pdf](http://medical.nema.org/medical/dicom/2008/08_16pu.pdf)

DICOM Part 16 has two Context Groups CID 7202 and CID 7203 which contain a set of codes defining reason for a source image reference (ie. reason code for referenced image sequence) and a coded description of the derivation applied to the new image data from the original. Both these context groups are extensible.

[File](#) Derivation is compulsory when creating a lossy derived image.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 10.129.2 Constructor & Destructor Documentation

#### 10.129.2.1 FileDerivation()

```
gdcm::FileDerivation::FileDerivation ( )
```

#### 10.129.2.2 ~FileDerivation()

```
gdcm::FileDerivation::~~FileDerivation ( )
```

### 10.129.3 Member Function Documentation

### 10.129.3.1 AddDerivationDescription()

```
bool gdcm::FileDerivation::AddDerivationDescription ( ) [protected]
```

### 10.129.3.2 AddPurposeOfReferenceCodeSequence()

```
bool gdcm::FileDerivation::AddPurposeOfReferenceCodeSequence (
    DataSet & ds ) [protected]
```

### 10.129.3.3 AddReference()

```
bool gdcm::FileDerivation::AddReference (
    const char * referencedsopclassuid,
    const char * referencedsopinstanceuid )
```

Create the proper reference. Need to pass the original SOP Class UID and the original SOP Instance UID, so that those value can be used as Reference.

#### Warning

referencedsopclassuid and referencedsopinstanceuid needs to be \0 padded. This is not compatible with how ByteValue->GetPointer works.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 10.129.3.4 AddSourceImageSequence()

```
bool gdcm::FileDerivation::AddSourceImageSequence ( ) [protected]
```

### 10.129.3.5 Derive()

```
bool gdcm::FileDerivation::Derive ( )
```

Change.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 10.129.3.6 GetFile() [1/2]

```
File & gdcmm::FileDerivation::GetFile ( ) [inline]
```

#### Examples

[GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 10.129.3.7 GetFile() [2/2]

```
const File & gdcmm::FileDerivation::GetFile ( ) const [inline]
```

### 10.129.3.8 SetAppendDerivationHistory()

```
void gdcmm::FileDerivation::SetAppendDerivationHistory (
    bool b )
```

Specify if Derivation history should be appended (default false) When false, this is an error if input already has a derivation history When true, both Purpose of Reference Code [Value](#) and Derivation Code Sequence Code [Value](#) can have their history appended.

### 10.129.3.9 SetDerivationCodeSequenceCodeValue()

```
void gdcmm::FileDerivation::SetDerivationCodeSequenceCodeValue (
    unsigned int codevalue )
```

Specify the Derivation Code Sequence Code [Value](#). Eg 113040.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 10.129.3.10 SetDerivationDescription()

```
void gdcmm::FileDerivation::SetDerivationDescription (
    const char * dd )
```

Specify the Derivation Description. Eg "lossy conversion".

### 10.129.3.11 SetFile()

```
void gdcmm::FileDerivation::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

### 10.129.3.12 SetPurposeOfReferenceCodeSequenceCodeValue()

```
void gdcmm::FileDerivation::SetPurposeOfReferenceCodeSequenceCodeValue (
    unsigned int codevalue )
```

Specify the Purpose Of Reference Code [Value](#). Eg. 121320.

#### Examples

[DeriveSeries.cxx](#), [GenFakelImage.cxx](#), and [ReformatFile.cs](#).

The documentation for this class was generated from the following file:

- [gdcmmFileDerivation.h](#)

## 10.130 gdcmm::FileExplicitFilter Class Reference

[FileExplicitFilter](#) class.

```
#include <gdcmmFileExplicitFilter.h>
```

### Public Member Functions

- [FileExplicitFilter](#) ()
- [~FileExplicitFilter](#) ()=default
- bool [Change](#) ()  
*Set FMI Transfer Syntax.*
- [File](#) & [GetFile](#) ()
- void [SetChangePrivateTags](#) (bool b)  
*Decide whether or not to [VR](#)'ify private tags.*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get [File](#).*
- void [SetRecomputeItemLength](#) (bool b)  
*By default set Sequence & [Item](#) length to Undefined to avoid recomputing length:*
- void [SetRecomputeSequenceLength](#) (bool b)
- void [SetUseVRUN](#) (bool b)  
*When [VR](#)=16bits in explicit but Implicit has a 32bits length, use [VR](#)=UN.*



## Protected Member Functions

- bool [ChangeFMI](#) ()
- bool [ProcessDataSet](#) ([DataSet](#) &ds, [Dicts](#) const &dicts)

### 10.130.1 Detailed Description

[FileExplicitFilter](#) class.

After changing a file from Implicit to Explicit representation (see [ImageChangeTransferSyntax](#)) one operation is to make sure the [VR](#) of each DICOM attribute are accurate and do match the one from PS 3.6. Indeed when a file is written in Implicit representation, the [VR](#) is not stored directly in the file.

#### Warning

changing an implicit dataset to an explicit dataset is NOT a trivial task of simply changing the [VR](#) to the dict one:

- One has to make sure SQ is properly set
- One has to recompute the explicit length SQ
- One has to make sure that [VR](#) is valid for the encoding
- One has to make sure that [VR](#) 16bits can store the original value length

#### Examples

[GenAllVR.cxx](#), and [LargeVRDSExplicit.cxx](#).

### 10.130.2 Constructor & Destructor Documentation

#### 10.130.2.1 FileExplicitFilter()

```
gdcm::FileExplicitFilter::FileExplicitFilter ( ) [inline]
```

#### 10.130.2.2 ~FileExplicitFilter()

```
gdcm::FileExplicitFilter::~~FileExplicitFilter ( ) [default]
```

### 10.130.3 Member Function Documentation

### 10.130.3.1 Change()

```
bool gdcm::FileExplicitFilter::Change ( )
```

Set FMI Transfer Syntax.

Change

Examples

[GenAIIVR.cxx](#), and [LargeVRDSExplicit.cxx](#).

### 10.130.3.2 ChangeFMI()

```
bool gdcm::FileExplicitFilter::ChangeFMI ( ) [protected]
```

### 10.130.3.3 GetFile()

```
File & gdcm::FileExplicitFilter::GetFile ( ) [inline]
```

### 10.130.3.4 ProcessDataSet()

```
bool gdcm::FileExplicitFilter::ProcessDataSet (
    DataSet & ds,
    Dicts const & dicts ) [protected]
```

### 10.130.3.5 SetChangePrivateTags()

```
void gdcm::FileExplicitFilter::SetChangePrivateTags (
    bool b ) [inline]
```

Decide whether or not to [VR](#)ify private tags.

### 10.130.3.6 SetFile()

```
void gdcm::FileExplicitFilter::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

#### Examples

[GenAllVR.cxx](#), and [LargeVRDSExplicit.cxx](#).

### 10.130.3.7 SetRecomputeItemLength()

```
void gdcm::FileExplicitFilter::SetRecomputeItemLength (
    bool b )
```

By default set Sequence & [Item](#) length to Undefined to avoid recomputing length:

### 10.130.3.8 SetRecomputeSequenceLength()

```
void gdcm::FileExplicitFilter::SetRecomputeSequenceLength (
    bool b )
```

### 10.130.3.9 SetUseVRUN()

```
void gdcm::FileExplicitFilter::SetUseVRUN (
    bool b ) [inline]
```

When [VR](#)=16bits in explicit but Implicit has a 32bits length, use [VR](#)=UN.

The documentation for this class was generated from the following file:

- [gdcmFileExplicitFilter.h](#)

## 10.131 gdcm::FileMetaInformation Class Reference

Class to represent a [File](#) Meta Information.

```
#include <gdcmFileMetaInformation.h>
```

Inheritance diagram for gdcm::FileMetaInformation:

Collaboration diagram for gdcm::FileMetaInformation:

## Public Member Functions

- [FileMetalInformation](#) ()
- [FileMetalInformation](#) ([FileMetalInformation](#) const &fmi)
- [~FileMetalInformation](#) ()
- void [FillFromDataSet](#) ([DataSet](#) const &ds)  
*Construct a [FileMetalInformation](#) from an already existing [DataSet](#):*
- const [TransferSyntax](#) & [GetDataSetTransferSyntax](#) () const
- [VL](#) [GetFullLength](#) () const
- [MediaStorage](#) [GetMediaStorage](#) () const
- std::string [GetMediaStorageAsString](#) () const
- [TransferSyntax::NegociatedType](#) [GetMetalInformationTS](#) () const
- [Preamble](#) & [GetPreamble](#) ()
- const [Preamble](#) & [GetPreamble](#) () const  
*Get [Preamble](#).*
- void [Insert](#) (const [DataElement](#) &de)
- bool [IsValid](#) () const
- [FileMetalInformation](#) & [operator=](#) (const [FileMetalInformation](#) &fmi)
- std::istream & [Read](#) (std::istream &is)  
*Read.*
- std::istream & [ReadCompat](#) (std::istream &is)
- void [Replace](#) (const [DataElement](#) &de)
- void [SetDataSetTransferSyntax](#) (const [TransferSyntax](#) &ts)
- void [SetPreamble](#) (const [Preamble](#) &p)
- std::ostream & [Write](#) (std::ostream &os) const  
*Write.*

## Static Public Member Functions

- static void [AppendImplementationClassUID](#) (const char \*imp)
- static const char \* [GetImplementationClassUID](#) ()
- static const char \* [GetImplementationVersionName](#) ()
- static const char \* [GetSourceApplicationEntityTitle](#) ()
- static void [SetImplementationClassUID](#) (const char \*imp)  
*Override the GDCM default values:*
- static void [SetImplementationVersionName](#) (const char \*version)
- static void [SetSourceApplicationEntityTitle](#) (const char \*title)

## Protected Member Functions

- void [ComputeDataSetMediaStorageSOPClass](#) ()
- void [ComputeDataSetTransferSyntax](#) ()
- void [Default](#) ()
- template<typename TSwap >  
std::istream & [ReadCompatInternal](#) (std::istream &is)

## Static Protected Member Functions

- static const char \* [GetFileMetaInformationVersion](#) ()
- static const char \* [GetGDCMImplementationClassUID](#) ()
- static const char \* [GetGDCMImplementationVersionName](#) ()
- static const char \* [GetGDCMSourceApplicationEntityTitle](#) ()

## Protected Attributes

- [MediaStorage::MSType](#) DataSetMS
- [TransferSyntax](#) DataSetTS
- [TransferSyntax::NegociatedType](#) MetaInformationTS

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [FileMetaInformation](#) &\_val)

## Additional Inherited Members

### 10.131.1 Detailed Description

Class to represent a [File](#) Meta Information.

[FileMetaInformation](#) is a Explicit Structured Set. Whenever the file contains an [ImplicitDataElement DataSet](#), a conversion will take place.

Definition: The [File](#) Meta Information includes identifying information on the encapsulated Data Set. This header consists of a 128 byte [File Preamble](#), followed by a 4 byte DICOM prefix, followed by the [File](#) Meta Elements shown in [Table 7.1-1](#). This header shall be present in every DICOM file.

See also

[Writer Reader](#)

Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReformatFile.cs](#), and [StandardizeFiles.cs](#).

### 10.131.2 Constructor & Destructor Documentation

#### 10.131.2.1 FileMetaInformation() [1/2]

```
gdcM::FileMetaInformation::FileMetaInformation ( )
```

#### 10.131.2.2 ~FileMetaInformation()

```
gdcM::FileMetaInformation::~~FileMetaInformation ( )
```

#### 10.131.2.3 FileMetaInformation() [2/2]

```
gdcM::FileMetaInformation::FileMetaInformation (
    FileMetaInformation const & fmi ) [inline]
```

References [DataSetMS](#), [DataSetTS](#), and [MetaInformationTS](#).

### 10.131.3 Member Function Documentation

#### 10.131.3.1 AppendImplementationClassUID()

```
static void gdcM::FileMetaInformation::AppendImplementationClassUID (
    const char * imp ) [static]
```

#### 10.131.3.2 ComputeDataSetMediaStorageSOPClass()

```
void gdcM::FileMetaInformation::ComputeDataSetMediaStorageSOPClass ( ) [protected]
```

#### 10.131.3.3 ComputeDataSetTransferSyntax()

```
void gdcM::FileMetaInformation::ComputeDataSetTransferSyntax ( ) [protected]
```

#### 10.131.3.4 Default()

```
void gdcm::FileMetaInformation::Default ( ) [protected]
```

#### 10.131.3.5 FillFromDataSet()

```
void gdcm::FileMetaInformation::FillFromDataSet (
    DataSet const & ds )
```

Construct a [FileMetaInformation](#) from an already existing [DataSet](#):

#### 10.131.3.6 GetDataSetTransferSyntax()

```
const TransferSyntax & gdcm::FileMetaInformation::GetDataSetTransferSyntax ( ) const [inline]
```

#### Examples

[GetJPEGSamplePrecision.cxx](#), and [MergeTwoFiles.cxx](#).

#### 10.131.3.7 GetFileMetaInformationVersion()

```
static const char * gdcm::FileMetaInformation::GetFileMetaInformationVersion ( ) [static], [protected]
```

#### 10.131.3.8 GetFullLength()

```
VL gdcm::FileMetaInformation::GetFullLength ( ) const [inline]
```

References [gdcm::VL::GetLength\(\)](#).

#### 10.131.3.9 GetGDCMImplementationClassUID()

```
static const char * gdcm::FileMetaInformation::GetGDCMImplementationClassUID ( ) [static], [protected]
```

**10.131.3.10 GetGDCMImplementationVersionName()**

```
static const char * gdcM::FileMetaInformation::GetGDCMImplementationVersionName ( ) [static],  
[protected]
```

**10.131.3.11 GetGDCMSourceApplicationEntityTitle()**

```
static const char * gdcM::FileMetaInformation::GetGDCMSourceApplicationEntityTitle ( ) [static],  
[protected]
```

**10.131.3.12 GetImplementationClassUID()**

```
static const char * gdcM::FileMetaInformation::GetImplementationClassUID ( ) [static]
```

**10.131.3.13 GetImplementationVersionName()**

```
static const char * gdcM::FileMetaInformation::GetImplementationVersionName ( ) [static]
```

**10.131.3.14 GetMediaStorage()**

```
MediaStorage gdcM::FileMetaInformation::GetMediaStorage ( ) const
```

**10.131.3.15 GetMediaStorageAsString()**

```
std::string gdcM::FileMetaInformation::GetMediaStorageAsString ( ) const
```

**10.131.3.16 GetMetaInformationTS()**

```
TransferSyntax::NegociatedType gdcM::FileMetaInformation::GetMetaInformationTS ( ) const [inline]
```



**10.131.3.17 GetPreamble() [1/2]**

```
Preamble & gdcm::FileMetaInformation::GetPreamble ( ) [inline]
```

**10.131.3.18 GetPreamble() [2/2]**

```
const Preamble & gdcm::FileMetaInformation::GetPreamble ( ) const [inline]
```

Get [Preamble](#).

**10.131.3.19 GetSourceApplicationEntityTitle()**

```
static const char * gdcm::FileMetaInformation::GetSourceApplicationEntityTitle ( ) [static]
```

**10.131.3.20 Insert()**

```
void gdcm::FileMetaInformation::Insert (
    const DataElement & de ) [inline]
```

References [gdcmErrorMacro](#), [gdcm::Tag::GetGroup\(\)](#), and [gdcm::DataElement::GetTag\(\)](#).

**10.131.3.21 IsValid()**

```
bool gdcm::FileMetaInformation::IsValid ( ) const [inline]
```

**10.131.3.22 operator=()**

```
FileMetaInformation & gdcm::FileMetaInformation::operator= (
    const FileMetaInformation & fmi ) [inline]
```

References [DataSetMS](#), [DataSetTS](#), and [MetaInformationTS](#).

### 10.131.3.23 Read()

```
std::istream & gdcM::FileMetaInformation::Read (
    std::istream & is )
```

Read.

### 10.131.3.24 ReadCompat()

```
std::istream & gdcM::FileMetaInformation::ReadCompat (
    std::istream & is )
```

### 10.131.3.25 ReadCompatInternal()

```
template<typename TSwap >
std::istream & gdcM::FileMetaInformation::ReadCompatInternal (
    std::istream & is ) [protected]
```

### 10.131.3.26 Replace()

```
void gdcM::FileMetaInformation::Replace (
    const DataElement & de ) [inline]
```

#### Examples

[LargeVRDSExplicit.cxx](#).

References [gdcM::DataElement::GetTag\(\)](#).

### 10.131.3.27 SetDataSetTransferSyntax()

```
void gdcM::FileMetaInformation::SetDataSetTransferSyntax (
    const TransferSyntax & ts )
```

#### Examples

[CreateJPIPDataSet.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAIIVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MpegVideoInfo.cs](#), [QIDO-RS.cxx](#), [StreamImageReaderTest.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.131.3.28 SetImplementationClassUID()

```
static void gdcm::FileMetaInformation::SetImplementationClassUID (
    const char * imp ) [static]
```

Override the GDCM default values:

### 10.131.3.29 SetImplementationVersionName()

```
static void gdcm::FileMetaInformation::SetImplementationVersionName (
    const char * version ) [static]
```

### 10.131.3.30 SetPreamble()

```
void gdcm::FileMetaInformation::SetPreamble (
    const Preamble & p ) [inline]
```

### 10.131.3.31 SetSourceApplicationEntityTitle()

```
static void gdcm::FileMetaInformation::SetSourceApplicationEntityTitle (
    const char * title ) [static]
```

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [FixJAIBugJPEGLS.cxx](#), [GenerateDICOMDIR.cs](#), [ReformatFile.cs](#), and [StandardizeFiles.cs](#).

### 10.131.3.32 Write()

```
std::ostream & gdcm::FileMetaInformation::Write (
    std::ostream & os ) const
```

Write.

## 10.131.4 Friends And Related Function Documentation

#### 10.131.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const FileMetaInformation & _val ) [friend]
```

### 10.131.5 Member Data Documentation

#### 10.131.5.1 DataSetMS

[MediaStorage::MSType](#) `gdcm::FileMetaInformation::DataSetMS` [protected]

Referenced by [FileMetaInformation\(\)](#), and [operator=\(\)](#).

#### 10.131.5.2 DataSetTS

[TransferSyntax](#) `gdcm::FileMetaInformation::DataSetTS` [protected]

Referenced by [FileMetaInformation\(\)](#), and [operator=\(\)](#).

#### 10.131.5.3 MetaInformationTS

[TransferSyntax::NegociatedType](#) `gdcm::FileMetaInformation::MetaInformationTS` [protected]

Referenced by [FileMetaInformation\(\)](#), and [operator=\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmFileMetaInformation.h](#)

## 10.132 gdcm::Filename Class Reference

Class to manipulate file name's.

```
#include <gdcmFilename.h>
```

## Public Member Functions

- [Filename](#) (const char \*filename="")
- bool [EndWith](#) (const char ending[]) const  
*Does the filename ends with a particular string ?*
- const char \* [GetExtension](#) ()  
*return only the extension part of a filename*
- const char \* [GetFileName](#) () const  
*Return the full filename.*
- const char \* [GetName](#) ()  
*return only the name part of a filename*
- const char \* [GetPath](#) ()  
*Return only the path component of a filename.*
- bool [IsEmpty](#) () const  
*return whether the filename is empty*
- bool [IsIdentical](#) ([Filename](#) const &fn) const
- operator const char \* () const
- const char \* [ToUnixSlashes](#) ()  
*Convert backslash (windows style) to UNIX style slash.*
- const char \* [ToWindowsSlashes](#) ()  
*Convert forward slash (UNIX style) to windows style slash.*

## Static Public Member Functions

- static const char \* [Join](#) (const char \*path, const char \*filename)

### 10.132.1 Detailed Description

Class to manipulate file name's.

#### Note

OS independent representation of a filename (to query path, name and extension from a filename)

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#).

### 10.132.2 Constructor & Destructor Documentation

#### 10.132.2.1 Filename()

```
gdcm::Filename::Filename (
    const char * filename = "" ) [inline]
```

### 10.132.3 Member Function Documentation

#### 10.132.3.1 EndWith()

```
bool gdcm::Filename::EndWith (
    const char ending[] ) const
```

Does the filename ends with a particular string ?

#### 10.132.3.2 GetExtension()

```
const char * gdcm::Filename::GetExtension ( )
```

return only the extension part of a filename

#### 10.132.3.3 GetFileName()

```
const char * gdcm::Filename::GetFileName ( ) const [inline]
```

Return the full filename.

#### 10.132.3.4 GetName()

```
const char * gdcm::Filename::GetName ( )
```

return only the name part of a filename

#### 10.132.3.5 GetPath()

```
const char * gdcm::Filename::GetPath ( )
```

Return only the path component of a filename.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#).

### 10.132.3.6 IsEmpty()

```
bool gdcm::Filename::IsEmpty ( ) const [inline]
```

return whether the filename is empty

### 10.132.3.7 IsIdentical()

```
bool gdcm::Filename::IsIdentical (
    Filename const & fn ) const
```

### 10.132.3.8 Join()

```
static const char * gdcm::Filename::Join (
    const char * path,
    const char * filename ) [static]
```

Join two paths NOT THREAD SAFE

#### Examples

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

### 10.132.3.9 operator const char \*()

```
gdcm::Filename::operator const char * ( ) const [inline]
```

Simple operator to allow `Filename myfilename( "...")`; `const char * s = myfilename`;

### 10.132.3.10 ToUnixSlashes()

```
const char * gdcm::Filename::ToUnixSlashes ( )
```

Convert backslash (windows style) to UNIX style slash.

### 10.132.3.11 ToWindowsSlashes()

```
const char * gdcM::Filename::ToWindowsSlashes ( )
```

Convert forward slash (UNIX style) to windows style slash.

The documentation for this class was generated from the following file:

- [gdcMFilename.h](#)

## 10.133 gdcM::FileNameEvent Class Reference

[FileNameEvent](#).

```
#include <gdcMFileNameEvent.h>
```

Inheritance diagram for gdcM::FileNameEvent:

Collaboration diagram for gdcM::FileNameEvent:

### Public Types

- typedef [FileNameEvent](#) Self
- typedef [AnyEvent](#) Superclass

### Public Member Functions

- [FileNameEvent](#) (const char \*s="")
- [FileNameEvent](#) (const [Self](#) &s)
- [~FileNameEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcM::Event](#) \*e) const override
- const char \* [GetEventName](#) () const override
- const char \* [GetFileName](#) () const
- [::gdcM::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetFileName](#) (const char \*f)

### 10.133.1 Detailed Description

[FileNameEvent](#).

Special type of event triggered during processing of [FileSet](#)

See also

[AnyEvent](#)

Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).



## 10.133.2 Member Typedef Documentation

### 10.133.2.1 Self

```
typedef FileNameEvent gdcm::FileNameEvent::Self
```

### 10.133.2.2 Superclass

```
typedef AnyEvent gdcm::FileNameEvent::Superclass
```

## 10.133.3 Constructor & Destructor Documentation

### 10.133.3.1 [FileNameEvent\(\)](#) [1/2]

```
gdcm::FileNameEvent::FileNameEvent (
    const char * s = "" ) [inline]
```

### 10.133.3.2 [~FileNameEvent\(\)](#)

```
gdcm::FileNameEvent::~~FileNameEvent ( ) [override], [default]
```

### 10.133.3.3 [FileNameEvent\(\)](#) [2/2]

```
gdcm::FileNameEvent::FileNameEvent (
    const Self & s ) [inline]
```

## 10.133.4 Member Function Documentation

#### 10.133.4.1 CheckEvent()

```
bool gdcM::FileNameEvent::CheckEvent (
    const ::gdcM::Event * e ) const [inline], [override]
```

#### 10.133.4.2 GetEventName()

```
const char * gdcM::FileNameEvent::GetEventName ( ) const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcM::Event](#).

#### 10.133.4.3 GetFileName()

```
const char * gdcM::FileNameEvent::GetFileName ( ) const [inline]
```

#### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

#### 10.133.4.4 MakeObject()

```
::gdcM::Event * gdcM::FileNameEvent::MakeObject ( ) const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcM::Event](#).

#### 10.133.4.5 operator=()

```
void gdcM::FileNameEvent::operator= (
    const Self & ) [delete]
```

#### 10.133.4.6 SetFileName()

```
void gdcm::FileNameEvent::SetFileName (
    const char * f ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmFileNameEvent.h](#)

## 10.134 gdcm::FilenameGenerator Class Reference

[FilenameGenerator](#).

```
#include <gdcmFilenameGenerator.h>
```

### Public Types

- typedef std::vector< [FilenameType](#) > [FilenamesType](#)
- typedef std::string [FilenameType](#)
- typedef FilenamesType::size\_type [SizeType](#)

### Public Member Functions

- [FilenameGenerator](#) ()
- [~FilenameGenerator](#) ()=default
- bool [Generate](#) ()  
*Generate (return success)*
- const char \* [GetFilename](#) ([SizeType](#) n) const  
*Get a particular filename (call after Generate)*
- [FilenamesType](#) const & [GetFilenames](#) () const  
*Return all filenames.*
- [SizeType](#) [GetNumberOfFilenames](#) () const
- const char \* [GetPattern](#) () const
- const char \* [GetPrefix](#) () const
- void [SetNumberOfFilenames](#) ([SizeType](#) nfiles)  
*Set/Get the number of filenames to generate.*
- void [SetPattern](#) (const char \*pattern)  
*Set/Get pattern.*
- void [SetPrefix](#) (const char \*prefix)  
*Set/Get prefix.*

### 10.134.1 Detailed Description

[FilenameGenerator](#).

class to generate filenames based on a pattern (C-style)

Output will be:

for  $i = 0$ , number of filenames: `outfilename[i] = prefix + (pattern % i)`

where `pattern % i` means C-style `sprintf` of `Pattern` using value `'i'`

#### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

### 10.134.2 Member Typedef Documentation

#### 10.134.2.1 FilenamesType

```
typedef std::vector<FilenameType> gdcm::FilenameGenerator::FilenamesType
```

#### 10.134.2.2 FilenameType

```
typedef std::string gdcm::FilenameGenerator::FilenameType
```

#### 10.134.2.3 SizeType

```
typedef FilenamesType::size\_type gdcm::FilenameGenerator::SizeType
```

### 10.134.3 Constructor & Destructor Documentation

### 10.134.3.1 FilenameGenerator()

```
gdcm::FilenameGenerator::FilenameGenerator ( ) [inline]
```

### 10.134.3.2 ~FilenameGenerator()

```
gdcm::FilenameGenerator::~~FilenameGenerator ( ) [default]
```

## 10.134.4 Member Function Documentation

### 10.134.4.1 Generate()

```
bool gdcm::FilenameGenerator::Generate ( )
```

Generate (return success)

#### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

### 10.134.4.2 GetFilename()

```
const char * gdcm::FilenameGenerator::GetFilename (
    SizeType n ) const
```

Get a particular filename (call after Generate)

#### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

### 10.134.4.3 GetFileNames()

```
FilenameType const & gdcm::FilenameGenerator::GetFileNames ( ) const [inline]
```

Return all filenames.

#### 10.134.4.4 GetNumberOfFileNames()

```
SizeType gdcM::FilenameGenerator::GetNumberOfFileNames ( ) const
```

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 10.134.4.5 GetPattern()

```
const char * gdcM::FilenameGenerator::GetPattern ( ) const [inline]
```

#### 10.134.4.6 GetPrefix()

```
const char * gdcM::FilenameGenerator::GetPrefix ( ) const [inline]
```

#### 10.134.4.7 SetNumberOfFileNames()

```
void gdcM::FilenameGenerator::SetNumberOfFileNames (
    SizeType nfiles )
```

Set/Get the number of filenames to generate.

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 10.134.4.8 SetPattern()

```
void gdcM::FilenameGenerator::SetPattern (
    const char * pattern ) [inline]
```

Set/Get pattern.

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 10.134.4.9 SetPrefix()

```
void gdcm::FilenameGenerator::SetPrefix (
    const char * prefix ) [inline]
```

Set/Get prefix.

The documentation for this class was generated from the following file:

- [gdcmFilenameGenerator.h](#)

## 10.135 gdcm::FileSet Class Reference

```
#include <gdcmFileSet.h>
```

### Public Types

- typedef std::vector< [FileType](#) > [FilesType](#)
- typedef std::string [FileType](#)

### Public Member Functions

- [FileSet](#) ()
- bool [AddFile](#) (const char \*filename)
- void [AddFile](#) ([File](#) const &)
- [FilesType](#) const & [GetFiles](#) () const
- void [SetFiles](#) ([FilesType](#) const &files)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [FileSet](#) &d)

#### 10.135.1 Detailed Description

File-set: A File-set is a collection of DICOM Files (and possibly non-DICOM Files) that share a common naming space within which [File](#) IDs are unique.

#### 10.135.2 Member Typedef Documentation

### 10.135.2.1 FileType

```
typedef std::vector<FileType> gdcm::FileSet::FileType
```

### 10.135.2.2 FileType

```
typedef std::string gdcm::FileSet::FileType
```

## 10.135.3 Constructor & Destructor Documentation

### 10.135.3.1 FileSet()

```
gdcm::FileSet::FileSet ( ) [inline]
```

## 10.135.4 Member Function Documentation

### 10.135.4.1 AddFile() [1/2]

```
bool gdcm::FileSet::AddFile (
    const char * filename )
```

Add a file 'filename' to the list of files. Return true on success, false in case filename could not be found on system.

### 10.135.4.2 AddFile() [2/2]

```
void gdcm::FileSet::AddFile (
    File const & ) [inline]
```

**Deprecated** . Does nothing



#### 10.135.4.3 GetFiles()

```
FileType const & gdcm::FileSet::GetFiles ( ) const [inline]
```

#### 10.135.4.4 SetFiles()

```
void gdcm::FileSet::SetFiles (
    FileType const & files )
```

### 10.135.5 Friends And Related Function Documentation

#### 10.135.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const FileSet & d ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmFileSet.h](#)

## 10.136 gdcm::FileStreamer Class Reference

[FileStreamer](#).

```
#include <gdcmFileStreamer.h>
```

Inheritance diagram for gdcm::FileStreamer:

Collaboration diagram for gdcm::FileStreamer:

## Public Member Functions

- [FileStreamer](#) ()
- [~FileStreamer](#) () override
- bool [AppendToDataElement](#) (const [Tag](#) &t, const char \*array, size\_t len)  
*Append to previously started [Tag](#) t.*
- bool [AppendToGroupDataElement](#) (const [PrivateTag](#) &pt, const char \*array, size\_t len)  
*Append to previously started private creator.*
- bool [CheckDataElement](#) (const [Tag](#) &t)
- void [CheckTemplateFileName](#) (bool check)
- bool [ReserveDataElement](#) (size\_t len)
- bool [ReserveGroupDataElement](#) (unsigned short ndataelement)
- void [SetOutputFileName](#) (const char \*filename\_native)  
*Set output filename (target file)*
- void [SetTemplateFileName](#) (const char \*filename\_native)  
*Set input DICOM template filename.*
- bool [StartDataElement](#) (const [Tag](#) &t)
- bool [StartGroupDataElement](#) (const [PrivateTag](#) &pt, size\_t maxsize=0, uint8\_t startoffset=0)
- bool [StopDataElement](#) (const [Tag](#) &t)  
*Stop appending to tag t. This will compute the proper attribute length.*
- bool [StopGroupDataElement](#) (const [PrivateTag](#) &pt)  
*Stop appending to private creator.*

## Static Public Member Functions

- static [SmartPointer](#)< [FileStreamer](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

### 10.136.1 Detailed Description

[FileStreamer](#).

This class let a user create a massive DICOM [DataSet](#) from a template DICOM file, by appending chunks of data.

This class support two mode of operation:

1. Creating a single [DataElement](#) by appending chunk after chunk of data.
2. Creating a set of [DataElement](#) within the same group, using a private creator for start. New [DataElement](#) are added any time the user defined maximum size for data element is reached.

#### Warning

any existing [DataElement](#) is removed, pick carefully which [DataElement](#) to add.

#### Examples

[FileStreaming.cs](#).

## 10.136.2 Constructor & Destructor Documentation

### 10.136.2.1 FileStreamer()

```
gdcm::FileStreamer::FileStreamer ( )
```

### 10.136.2.2 ~FileStreamer()

```
gdcm::FileStreamer::~~FileStreamer ( ) [override]
```

## 10.136.3 Member Function Documentation

### 10.136.3.1 AppendToDataElement()

```
bool gdcm::FileStreamer::AppendToDataElement (
    const Tag & t,
    const char * array,
    size_t len )
```

Append to previously started [Tag](#) t.

### 10.136.3.2 AppendToGroupDataElement()

```
bool gdcm::FileStreamer::AppendToGroupDataElement (
    const PrivateTag & pt,
    const char * array,
    size_t len )
```

Append to previously started private creator.

### Examples

[FileStreaming.cs](#).

### 10.136.3.3 CheckDataElement()

```
bool gdcM::FileStreamer::CheckDataElement (
    const Tag & t )
```

Decide to check the Data Element to be written (default: off) The implementation has default strategy for checking validity of DataElement. Currently it only support checking for the following tags:

- (7fe0,0010) Pixel Data

### 10.136.3.4 CheckTemplateFileName()

```
void gdcM::FileStreamer::CheckTemplateFileName (
    bool check )
```

Instead of simply blindly copying the input DICOM Template file, GDCM will be used to check the input file, and correct any issues recognized within the file. Only use if you do not have control over the input template file.

### 10.136.3.5 New()

```
static SmartPointer< FileStreamer > gdcM::FileStreamer::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

### 10.136.3.6 ReserveDataElement()

```
bool gdcM::FileStreamer::ReserveDataElement (
    size_t len )
```

Add a hint on the final size of the dataelement. When optimally chosen, this reduce the number of file in-place copying. Should be called before StartDataElement

### 10.136.3.7 ReserveGroupDataElement()

```
bool gdcM::FileStreamer::ReserveGroupDataElement (
    unsigned short ndataelement )
```

Optimisation: pre-allocate the number of dataelement within the private group (ndataelement <= 256). Should be called before StartGroupDataElement

### 10.136.3.8 SetOutputFileName()

```
void gdcm::FileStreamer::SetOutputFileName (
    const char * filename_native )
```

Set output filename (target file)

#### Examples

[FileStreaming.cs](#).

### 10.136.3.9 SetTemplateFileName()

```
void gdcm::FileStreamer::SetTemplateFileName (
    const char * filename_native )
```

Set input DICOM template filename.

#### Examples

[FileStreaming.cs](#).

### 10.136.3.10 StartDataElement()

```
bool gdcm::FileStreamer::StartDataElement (
    const Tag & t )
```

Start Single Data [Element](#) Operation This will delete any existing [Tag](#) t. Need to call it only once.

### 10.136.3.11 StartGroupDataElement()

```
bool gdcm::FileStreamer::StartGroupDataElement (
    const PrivateTag & pt,
    size_t maxsize = 0,
    uint8_t startoffset = 0 )
```

Start Private Group (multiple [DataElement](#)) Operation. Each newly added [DataElement](#) will have a length lower than

## Parameters

<i>maxsize</i>	. When not specified, maxsize is set to maximum size allowed by DICOM ( $= 2^{32}$ ). startoffset can be used to specify the very first element you want to start with (instead of the first possible). <a href="#">Value</a> should be in [0x0, 0xff] This will find the first available private creator.
----------------	--

**Bug** maxsize should be a value lower than the actual total size of the buffer to be copied

## Examples

[FileStreaming.cs](#).

**10.136.3.12 StopDataElement()**

```
bool gdcM::FileStreamer::StopDataElement (
    const Tag & t )
```

Stop appending to tag t. This will compute the proper attribute length.

**10.136.3.13 StopGroupDataElement()**

```
bool gdcM::FileStreamer::StopGroupDataElement (
    const PrivateTag & pt )
```

Stop appending to private creator.

## Examples

[FileStreaming.cs](#).

The documentation for this class was generated from the following file:

- [gdcMFileStreamer.h](#)

**10.137 gdcM::FileWithName Class Reference**

[FileWithName](#).

```
#include <gdcMSerieHelper.h>
```

Inheritance diagram for gdcM::FileWithName:

Collaboration diagram for gdcM::FileWithName:

## Public Member Functions

- [FileWithName](#) ([File](#) &*f*)

## Public Attributes

- `std::string` [filename](#)

## Additional Inherited Members

### 10.137.1 Detailed Description

[FileWithName](#).

Backward only class do not use in newer code

### 10.137.2 Constructor & Destructor Documentation

#### 10.137.2.1 FileWithName()

```
gdcm::FileWithName::FileWithName (
    File & f ) [inline]
```

### 10.137.3 Member Data Documentation

#### 10.137.3.1 filename

```
std::string gdcm::FileWithName::filename
```

The documentation for this class was generated from the following file:

- [gdcmSerieHelper.h](#)

## 10.138 gdcm::FindPatientRootQuery Class Reference

PatientRootQuery.

```
#include <gdcmFindPatientRootQuery.h>
```

Inheritance diagram for gdcm::FindPatientRootQuery:

Collaboration diagram for gdcm::FindPatientRootQuery:

### Public Member Functions

- [FindPatientRootQuery](#) ()
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [std::vector< Tag > GetTagListByLevel](#) (const [EQueryLevel](#) &inQueryLevel) override
- [void InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- [bool ValidateQuery](#) (bool inStrict=true) const override

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

#### 10.138.1 Detailed Description

PatientRootQuery.

contains: the class which will produce a dataset for c-find with patient root

#### 10.138.2 Constructor & Destructor Documentation

##### 10.138.2.1 FindPatientRootQuery()

```
gdcm::FindPatientRootQuery::FindPatientRootQuery ( )
```

#### 10.138.3 Member Function Documentation



### 10.138.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::FindPatientRootQuery::GetAbstractSyntaxUID ( ) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 10.138.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::FindPatientRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 10.138.3.3 InitializeDataSet()

```
void gdcm::FindPatientRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcm4k

Implements [gdcm::BaseRootQuery](#).

### 10.138.3.4 ValidateQuery()

```
bool gdcm::FindPatientRootQuery::ValidateQuery (
    bool inStrict = true ) const [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseRootQuery](#).

## 10.138.4 Friends And Related Function Documentation

### 10.138.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

The documentation for this class was generated from the following file:

- [gdcmFindPatientRootQuery.h](#)

## 10.139 gdcm::FindStudyRootQuery Class Reference

[FindStudyRootQuery](#).

```
#include <gdcmFindStudyRootQuery.h>
```

Inheritance diagram for `gdcm::FindStudyRootQuery`:

Collaboration diagram for `gdcm::FindStudyRootQuery`:

### Public Member Functions

- [FindStudyRootQuery](#) ()
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- `std::vector< Tag > GetTagListByLevel` (const [EQueryLevel](#) &inQueryLevel) override
- void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

## 10.139.1 Detailed Description

[FindStudyRootQuery](#).

contains: the class which will produce a dataset for C-FIND with study root

## 10.139.2 Constructor & Destructor Documentation

### 10.139.2.1 FindStudyRootQuery()

```
gdcm::FindStudyRootQuery::FindStudyRootQuery ( )
```

## 10.139.3 Member Function Documentation

### 10.139.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::FindStudyRootQuery::GetAbstractSyntaxUID ( ) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 10.139.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::FindStudyRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 10.139.3.3 InitializeDataSet()

```
void gdcm::FindStudyRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmtk

Implements [gdcm::BaseRootQuery](#).

### 10.139.3.4 ValidateQuery()

```
bool gdcM::FindStudyRootQuery::ValidateQuery (
    bool inStrict = true ) const [override], [virtual]
```

have to be able to ensure that (0008,0052) is set that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional)

Implements [gdcM::BaseRootQuery](#).

## 10.139.4 Friends And Related Function Documentation

### 10.139.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

The documentation for this class was generated from the following file:

- [gdcMFindStudyRootQuery.h](#)

## 10.140 gdcM::Fragment Class Reference

Class to represent a [Fragment](#).

```
#include <gdcMFragment.h>
```

Inheritance diagram for gdcM::Fragment:

Collaboration diagram for gdcM::Fragment:

### Public Member Functions

- [Fragment](#) ()
- [VL ComputeLength](#) () const
- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadBacktrack](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is)
- template<typename TSwap >  
std::ostream & [Write](#) (std::ostream &os) const

## Friends

- `std::ostream & operator<< (std::ostream &os, const Fragment &val)`

## Additional Inherited Members

### 10.140.1 Detailed Description

Class to represent a [Fragment](#).

#### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), and [MpegVideoInfo.cs](#).

### 10.140.2 Constructor & Destructor Documentation

#### 10.140.2.1 [Fragment\(\)](#)

```
gdcm::Fragment::Fragment ( ) [inline]
```

### 10.140.3 Member Function Documentation

#### 10.140.3.1 [ComputeLength\(\)](#)

```
VL gdcm::Fragment::ComputeLength ( ) const
```

#### 10.140.3.2 [GetLength\(\)](#)

```
VL gdcm::Fragment::GetLength ( ) const
```

### 10.140.3.3 Read()

```
template<typename TSwap >
std::istream & gdcmm::Fragment::Read (
    std::istream & is ) [inline]
```

Referenced by [gdcmm::SequenceOfFragments::ReadValue\(\)](#).

### 10.140.3.4 ReadBacktrack()

```
template<typename TSwap >
std::istream & gdcmm::Fragment::ReadBacktrack (
    std::istream & is ) [inline]
```

References [gdcmmErrorMacro](#), [gdcmmWarningMacro](#), and [gdcmm::ParseException::SetLastElement\(\)](#).

Referenced by [gdcmm::SequenceOfFragments::ReadValue\(\)](#).

### 10.140.3.5 ReadPreValue()

```
template<typename TSwap >
std::istream & gdcmm::Fragment::ReadPreValue (
    std::istream & is ) [inline]
```

### 10.140.3.6 ReadValue()

```
template<typename TSwap >
std::istream & gdcmm::Fragment::ReadValue (
    std::istream & is ) [inline]
```

References [gdcmmWarningMacro](#), and [gdcmm::ParseException::SetLastElement\(\)](#).

### 10.140.3.7 Write()

```
template<typename TSwap >
std::ostream & gdcmm::Fragment::Write (
    std::ostream & os ) const [inline]
```

References [gdcmm::ByteValue::ComputeLength\(\)](#), [gdcmm::ByteValue::GetLength\(\)](#), [gdcmm::ByteValue::Write\(\)](#), and [gdcmm::VL::Write\(\)](#).

## 10.140.4 Friends And Related Function Documentation

### 10.140.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Fragment & val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmFragment.h](#)

## 10.141 gdcm::Global Class Reference

[Global](#).

```
#include <gdcmGlobal.h>
```

### Public Member Functions

- [Global](#) ()
- [Global](#) (const [Global](#) &\_val)=delete
- [~Global](#) ()
- bool [Append](#) (const char \*path)
- [Defs](#) const & [GetDefs](#) () const
- [Dicts](#) & [GetDicts](#) ()
- [Dicts](#) const & [GetDicts](#) () const
- bool [LoadResourcesFiles](#) ()
- [Global](#) & [operator=](#) (const [Global](#) &\_val)=delete
- bool [Prepend](#) (const char \*path)

### Static Public Member Functions

- static [Global](#) & [GetInstance](#) ()  
*return the singleton instance*

### Protected Member Functions

- const char \* [Locate](#) (const char \*resfile) const  
*Locate a resource file.*

## Friends

- `std::ostream & operator<< (std::ostream &_os, const Global &g)`

### 10.141.1 Detailed Description

[Global](#).

#### Note

[Global](#) should be included in any translation unit that will use [Dict](#) or that implements the singleton pattern. It makes sure that the [Dict](#) singleton is created before and destroyed after all other singletons in GDCM.

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenerateStandardSOPClasses.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

### 10.141.2 Constructor & Destructor Documentation

#### 10.141.2.1 Global() [1/2]

```
gdcmm::Global::Global ( )
```

#### 10.141.2.2 ~Global()

```
gdcmm::Global::~~Global ( )
```

#### 10.141.2.3 Global() [2/2]

```
gdcmm::Global::Global (
    const Global &_val ) [delete]
```

### 10.141.3 Member Function Documentation



### 10.141.3.1 Append()

```
bool gdcm::Global::Append (
    const char * path )
```

Append path at the end of the path list

#### Warning

not thread safe !

### 10.141.3.2 GetDefs()

```
Defs const & gdcm::Global::GetDefs ( ) const
```

retrieve the default/internal (Part 3) You need to explicitly call LoadResourcesFiles before

#### Examples

[GenerateStandardSOPClasses.cxx](#), and [TraverseModules.cxx](#).

### 10.141.3.3 GetDicts() [1/2]

```
Dicts & gdcm::Global::GetDicts ( )
```

### 10.141.3.4 GetDicts() [2/2]

```
Dicts const & gdcm::Global::GetDicts ( ) const
```

retrieve the default/internal dicts (Part 6) This dict is filled up at load time

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [MrProtocol.cxx](#), [PublicDict.cxx](#), [ReadAndPrintAttributes.cxx](#), and [TraverseModules.cxx](#).

### 10.141.3.5 GetInstance()

```
static Global & gdcM::Global::GetInstance ( ) [static]
```

return the singleton instance

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenerateStandardSOPClasses.cxx](#), [MrProtocol.cxx](#), [PublicDict.cxx](#), and [ReadAndPrintAttributes.cxx](#).

### 10.141.3.6 LoadResourcesFiles()

```
bool gdcM::Global::LoadResourcesFiles ( )
```

Load all internal XML files, resource path need to have been set before calling this member function (see [Append/↔](#) Prepend members func)

#### Warning

not thread safe !

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [GenerateStandardSOPClasses.cxx](#), and [TraverseModules.cxx](#).

### 10.141.3.7 Locate()

```
const char * gdcM::Global::Locate (
    const char * resfile ) const [protected]
```

Locate a resource file.

### 10.141.3.8 operator=()

```
Global & gdcM::Global::operator= (
    const Global & _val ) [delete]
```

### 10.141.3.9 Prepend()

```
bool gdcm::Global::Prepend (
    const char * path )
```

Prepend path at the beginning of the path list

#### Warning

not thread safe !

## 10.141.4 Friends And Related Function Documentation

### 10.141.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Global & g ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmGlobal.h](#)

## 10.142 gdcm::GroupDict Class Reference

Class to represent the mapping from group number to its abbreviation and name.

```
#include <gdcmGroupDict.h>
```

### Public Types

- typedef std::vector< std::string > [GroupStringVector](#)

### Public Member Functions

- [GroupDict](#) ()
- [~GroupDict](#) ()=default
- std::string const & [GetAbbreviation](#) (uint16\_t num) const
- std::string const & [GetName](#) (uint16\_t num) const
- size\_t [Size](#) () const

## Protected Member Functions

- void [Add](#) (std::string const &abbreviation, std::string const &name)
- void [Insert](#) (uint16\_t num, std::string const &abbreviation, std::string const &name)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [GroupDict](#) &\_val)

### 10.142.1 Detailed Description

Class to represent the mapping from group number to its abbreviation and name.

#### Note

Should I rewrite this class to use a std::map instead of std::vector for problem of memory consumption ?

### 10.142.2 Member Typedef Documentation

#### 10.142.2.1 GroupStringVector

```
typedef std::vector<std::string> gdc::GroupDict::GroupStringVector
```

### 10.142.3 Constructor & Destructor Documentation

#### 10.142.3.1 GroupDict()

```
gdc::GroupDict::GroupDict ( ) [inline]
```

#### 10.142.3.2 ~GroupDict()

```
gdc::GroupDict::~~GroupDict ( ) [default]
```

## 10.142.4 Member Function Documentation

### 10.142.4.1 Add()

```
void gdcm::GroupDict::Add (
    std::string const & abbreviation,
    std::string const & name ) [protected]
```

### 10.142.4.2 GetAbbreviation()

```
std::string const & gdcm::GroupDict::GetAbbreviation (
    uint16_t num ) const
```

### 10.142.4.3 GetName()

```
std::string const & gdcm::GroupDict::GetName (
    uint16_t num ) const
```

### 10.142.4.4 Insert()

```
void gdcm::GroupDict::Insert (
    uint16_t num,
    std::string const & abbreviation,
    std::string const & name ) [protected]
```

### 10.142.4.5 Size()

```
size_t gdcm::GroupDict::Size ( ) const [inline]
```

## 10.142.5 Friends And Related Function Documentation

### 10.142.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const GroupDict & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmlGroupDict.h](#)

## 10.143 gdcmlIconImageFilter Class Reference

[IconImageFilter](#).

```
#include <gdcmlIconImageFilter.h>
```

### Public Member Functions

- [IconImageFilter](#) ()
- [~IconImageFilter](#) ()
- bool [Extract](#) ()  
*Extract all Icon found in File.*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- [IconImage](#) & [GetIconImage](#) (unsigned int i) const
- unsigned int [GetNumberOfIconImages](#) () const  
*Retrieve extract IconImage (need to call Extract first)*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get File.*

### Protected Member Functions

- void [ExtractIconImages](#) ()
- void [ExtractVeprolIconImages](#) ()

### 10.143.1 Detailed Description

[IconImageFilter](#).

This filter will extract icons from a [File](#) This filter will loop over all known sequence (public and private) that may contains an IconImage and retrieve them. The filter will fails with a value of false if no icon can be found Since it handle both public and private icon type, one should not assume the icon is in uncompress form, some private vendor store private icon in JPEG8/JPEG12

Implementation details: This filter supports the following Icons:

- (0088,0200) Icon [Image](#) Sequence
- (0009,10,GEIIS) GE IIS Thumbnail Sequence
- (6003,10,GEMS\_Ultrasound\_ImageGroup\_001) GEMS [Image](#) Thumbnail Sequence
- (0055,30,VEPRO VIF 3.0 DATA) Icon Data
- (0055,30,VEPRO VIM 5.0 DATA) ICONDATA2

#### Warning

the icon stored in those private attribute do not conform to definition of Icon [Image](#) Sequence (do not simply copy/paste). For example some private icon can be expressed as 12bits pixel, while the DICOM standard only allow 8bits icons.

#### See also

[ImageReader](#)

#### Examples

[ExtractIconFromFile.cxx](#).

### 10.143.2 Constructor & Destructor Documentation

#### 10.143.2.1 IconImageFilter()

```
gdcm::IconImageFilter::IconImageFilter ( )
```

#### 10.143.2.2 ~IconImageFilter()

```
gdcm::IconImageFilter::~~IconImageFilter ( )
```

### 10.143.3 Member Function Documentation

#### 10.143.3.1 Extract()

```
bool gdcM::IconImageFilter::Extract ( )
```

Extract all Icon found in [File](#).

#### Examples

[ExtractIconFromFile.cxx](#).

#### 10.143.3.2 ExtractIconImages()

```
void gdcM::IconImageFilter::ExtractIconImages ( ) [protected]
```

#### 10.143.3.3 ExtractVeprolIconImages()

```
void gdcM::IconImageFilter::ExtractVeproIconImages ( ) [protected]
```

#### 10.143.3.4 GetFile() [1/2]

```
File & gdcM::IconImageFilter::GetFile ( ) [inline]
```

#### 10.143.3.5 GetFile() [2/2]

```
const File & gdcM::IconImageFilter::GetFile ( ) const [inline]
```



### 10.143.3.6 GetIconImage()

```
IconImage & gdcm::IconImageFilter::GetIconImage (
    unsigned int i ) const
```

#### Examples

[ExtractIconFromFile.cxx](#).

### 10.143.3.7 GetNumberOfIconImages()

```
unsigned int gdcm::IconImageFilter::GetNumberOfIconImages ( ) const
```

Retrieve extract IconImage (need to call Extract first)

#### Examples

[ExtractIconFromFile.cxx](#).

### 10.143.3.8 SetFile()

```
void gdcm::IconImageFilter::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

#### Examples

[ExtractIconFromFile.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmIconImageFilter.h](#)

## 10.144 gdcm::IconImageGenerator Class Reference

[IconImageGenerator](#).

```
#include <gdcmIconImageGenerator.h>
```

## Public Member Functions

- [IconImageGenerator](#) ()
- [~IconImageGenerator](#) ()
- void [AutoPixelMinMax](#) (bool b)
- void [ConvertRGBToPaletteColor](#) (bool b)
- bool [Generate](#) ()  
*Generate Icon.*
- const [IconImage](#) & [GetIconImage](#) () const  
*Retrieve generated Icon.*
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const
- void [SetOutputDimensions](#) (const unsigned int dims[2])  
*Set Target dimension of output Icon.*
- void [SetOutsideValuePixel](#) (double v)
- void [SetPixelMinMax](#) (double min, double max)
- void [SetPixmap](#) (const [Pixmap](#) &p)  
*Set/Get File.*

### 10.144.1 Detailed Description

[IconImageGenerator](#).

This filter will generate a valid Icon from the Pixel Data element (an instance of [Pixmap](#)). To generate a valid Icon, one is only allowed the following Photometric Interpretation:

- MONOCHROME1
- MONOCHROME2
- PALETTE\_COLOR

The Pixel Bits Allocated is restricted to 8bits, therefore 16 bits image needs to be rescaled. By default the filter will use the full scalar range of 16bits image to rescale to unsigned 8bits. This may not be ideal for some situation, in which case the API [SetPixelMinMax](#) can be used to overwrite the default min,max interval used.

See also

[ImageReader](#)

Examples

[ExtractIconFromFile.cxx](#).

### 10.144.2 Constructor & Destructor Documentation

### 10.144.2.1 IconImageGenerator()

```
gdcm::IconImageGenerator::IconImageGenerator ( )
```

### 10.144.2.2 ~IconImageGenerator()

```
gdcm::IconImageGenerator::~~IconImageGenerator ( )
```

## 10.144.3 Member Function Documentation

### 10.144.3.1 AutoPixelMinMax()

```
void gdcm::IconImageGenerator::AutoPixelMinMax (
    bool b )
```

Instead of explicitly specifying the min/max value for the rescale operation, let the internal mechanism compute the min/max of icon and rescale to best appropriate.

#### Examples

[ExtractIconFromFile.cxx](#).

### 10.144.3.2 ConvertRGBToPaletteColor()

```
void gdcm::IconImageGenerator::ConvertRGBToPaletteColor (
    bool b )
```

Converting from RGB to PALETTE\_COLOR can be a slow operation. However DICOM standard requires that color icon be described as palette. Set this boolean to false only if you understand the consequences. default value is true, false generates invalid Icon [Image](#) Sequence

### 10.144.3.3 Generate()

```
bool gdcm::IconImageGenerator::Generate ( )
```

Generate Icon.

#### Examples

[ExtractIconFromFile.cxx](#).

#### 10.144.3.4 GetIconImage()

```
const IconImage & gdcm::IconImageGenerator::GetIconImage ( ) const [inline]
```

Retrieve generated Icon.

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.144.3.5 GetPixmap() [1/2]

```
Pixmap & gdcm::IconImageGenerator::GetPixmap ( ) [inline]
```

#### 10.144.3.6 GetPixmap() [2/2]

```
const Pixmap & gdcm::IconImageGenerator::GetPixmap ( ) const [inline]
```

#### 10.144.3.7 SetOutputDimensions()

```
void gdcm::IconImageGenerator::SetOutputDimensions (
    const unsigned int dims[2] )
```

Set Target dimension of output Icon.

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.144.3.8 SetOutsideValuePixel()

```
void gdcm::IconImageGenerator::SetOutsideValuePixel (
    double v )
```

Set a pixel value that should be discarded. This happen typically for CT image, where a pixel has been used to pad outside the image (see Pixel Padding [Value](#)). Requires `AutoPixelMinMax(true)`

### 10.144.3.9 SetPixelMinMax()

```
void gdcm::IconImageGenerator::SetPixelMinMax (
    double min,
    double max )
```

Override default min/max to compute best rescale for 16bits -> 8bits downscale. Typically those value can be read from the SmallestImagePixelValue LargestImagePixelValue DICOM attribute.

### 10.144.3.10 SetPixmap()

```
void gdcm::IconImageGenerator::SetPixmap (
    const Pixmap & p ) [inline]
```

Set/Get [File](#).

#### Examples

[ExtractIconFromFile.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmIconImageGenerator.h](#)

## 10.145 gdcm::ignore\_char Struct Reference

```
#include <gdcmElement.h>
```

### Public Member Functions

- [ignore\\_char](#) (char *c*)

### Public Attributes

- char [m\\_char](#)

### 10.145.1 Constructor & Destructor Documentation

### 10.145.1.1 ignore\_char()

```
gdcm::ignore_char::ignore_char (
    char c ) [inline]
```

## 10.145.2 Member Data Documentation

### 10.145.2.1 m\_char

```
char gdcm::ignore_char::m_char
```

Referenced by [gdcm::operator>>\(\)](#).

The documentation for this struct was generated from the following file:

- [gdcmElement.h](#)

## 10.146 gdcm::Image Class Reference

[Image](#).

```
#include <gdcmImage.h>
```

Inheritance diagram for gdcm::Image:

Collaboration diagram for gdcm::Image:

### Public Member Functions

- [Image](#) ()
- [~Image](#) () override=default
- const double \* [GetDirectionCosines](#) () const
- double [GetDirectionCosines](#) (unsigned int idx) const
- double [GetIntercept](#) () const
- const double \* [GetOrigin](#) () const
- double [GetOrigin](#) (unsigned int idx) const
- double [GetSlope](#) () const
- const double \* [GetSpacing](#) () const
- double [GetSpacing](#) (unsigned int idx) const
- void [Print](#) (std::ostream &os) const override
- *print*
- void [SetDirectionCosines](#) (const double dircos[6])

- void [SetDirectionCosines](#) (const float dircos[6])
- void [SetDirectionCosines](#) (unsigned int idx, double dircos)
- void [SetIntercept](#) (double intercept)  
*intercept*
- void [SetOrigin](#) (const double origin[3])
- void [SetOrigin](#) (const float origin[3])
- void [SetOrigin](#) (unsigned int idx, double ori)
- void [SetSlope](#) (double slope)  
*slope*
- void [SetSpacing](#) (const double spacing[3])
- void [SetSpacing](#) (unsigned int idx, double spacing)

## Additional Inherited Members

### 10.146.1 Detailed Description

[Image](#).

This is the container for an [Image](#) in the general sense. From this container you should be able to request information like:

- Origin
- Dimension
- [PixelFormat](#) ... But also to retrieve the image as a raw buffer (char \*) Since we have to deal with both RAW data and JPEG stream (which internally encode all the above information) this API might seems redundant. One way to solve that would be to subclass [Image](#) with JPEGImage which would from the stream extract the header info and fill it to please [Image](#)...well except origin for instance

Basically you can see it as a storage for the Pixel Data element (7fe0,0010).

#### Warning

This class does some heuristics to guess the [Spacing](#) but is not compatible with DICOM CP-586. In case of doubt use [PixmapReader](#) instead

#### See also

[ImageReader](#) [PixmapReader](#)

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [ExtractIconFromFile.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenFakeImage.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MpegVideoInfo.cs](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), and [threadgdcm.cxx](#).

## 10.146.2 Constructor & Destructor Documentation

### 10.146.2.1 Image()

```
gdcm::Image::Image ( ) [inline]
```

### 10.146.2.2 ~Image()

```
gdcm::Image::~Image ( ) [override], [default]
```

## 10.146.3 Member Function Documentation

### 10.146.3.1 GetDirectionCosines() [1/2]

```
const double * gdcm::Image::GetDirectionCosines ( ) const
```

Return a 6-tuples specifying the direction cosines A default value of (1,0,0,0,1,0) will be return when the direction cosines was not specified.

### 10.146.3.2 GetDirectionCosines() [2/2]

```
double gdcm::Image::GetDirectionCosines (
    unsigned int idx ) const
```

### 10.146.3.3 GetIntercept()

```
double gdcm::Image::GetIntercept ( ) const [inline]
```



#### 10.146.3.4 GetOrigin() [1/2]

```
const double * gdcm::Image::GetOrigin ( ) const
```

Return a 3-tuples specifying the origin Will return (0,0,0) if the origin was not specified.

##### Examples

[HelloVizWorld.cxx](#).

#### 10.146.3.5 GetOrigin() [2/2]

```
double gdcm::Image::GetOrigin (
    unsigned int idx ) const
```

#### 10.146.3.6 GetSlope()

```
double gdcm::Image::GetSlope ( ) const [inline]
```

#### 10.146.3.7 GetSpacing() [1/2]

```
const double * gdcm::Image::GetSpacing ( ) const
```

Return a 3-tuples specifying the spacing NOTE: 3rd value can be an arbitrary 1 value when the spacing was not specified (ex. 2D image). WARNING: when the spacing is not specifier, a default value of 1 will be returned

#### 10.146.3.8 GetSpacing() [2/2]

```
double gdcm::Image::GetSpacing (
    unsigned int idx ) const
```

### 10.146.3.9 Print()

```
void gdcm::Image::Print (
    std::ostream & os ) const [override], [virtual]
```

print

Reimplemented from [gdcm::Bitmap](#).

#### Examples

[CompressImage.cxx](#), and [PatchFile.cxx](#).

### 10.146.3.10 SetDirectionCosines() [1/3]

```
void gdcm::Image::SetDirectionCosines (
    const double dircos[6] )
```

### 10.146.3.11 SetDirectionCosines() [2/3]

```
void gdcm::Image::SetDirectionCosines (
    const float dircos[6] )
```

### 10.146.3.12 SetDirectionCosines() [3/3]

```
void gdcm::Image::SetDirectionCosines (
    unsigned int idx,
    double dircos )
```

### 10.146.3.13 SetIntercept()

```
void gdcm::Image::SetIntercept (
    double intercept ) [inline]
```

intercept

#### Examples

[TemplateEmptyImage.cxx](#).

**10.146.3.14 SetOrigin() [1/3]**

```
void gdcm::Image::SetOrigin (
    const double origin[3] )
```

**10.146.3.15 SetOrigin() [2/3]**

```
void gdcm::Image::SetOrigin (
    const float origin[3] )
```

**10.146.3.16 SetOrigin() [3/3]**

```
void gdcm::Image::SetOrigin (
    unsigned int idx,
    double ori )
```

**10.146.3.17 SetSlope()**

```
void gdcm::Image::SetSlope (
    double slope ) [inline]
```

*slope*

**Examples**

[TemplateEmptyImage.cxx](#).

**10.146.3.18 SetSpacing() [1/2]**

```
void gdcm::Image::SetSpacing (
    const double spacing[3] )
```

**Examples**

[csa2img.cxx](#), and [iU22tomultisc.cxx](#).

### 10.146.3.19 SetSpacing() [2/2]

```
void gdcM::Image::SetSpacing (
    unsigned int idx,
    double spacing )
```

The documentation for this class was generated from the following file:

- [gdcMImage.h](#)

## 10.147 gdcM::ImageApplyLookupTable Class Reference

[ImageApplyLookupTable](#) class.

```
#include <gdcMImageApplyLookupTable.h>
```

Inheritance diagram for gdcM::ImageApplyLookupTable:

Collaboration diagram for gdcM::ImageApplyLookupTable:

### Public Member Functions

- [ImageApplyLookupTable](#) ()
- [~ImageApplyLookupTable](#) ()
- bool [Apply](#) ()  
*Apply.*
- void [SetRGB8](#) (bool b)  
*RGB8 ?*

### Additional Inherited Members

#### 10.147.1 Detailed Description

[ImageApplyLookupTable](#) class.

It applies the LUT the PixelData (only PALETTE\_COLOR images) Output will be a [PhotometricInterpretation=RGB](#) image

#### 10.147.2 Constructor & Destructor Documentation

### 10.147.2.1 ImageApplyLookupTable()

```
gdcm::ImageApplyLookupTable::ImageApplyLookupTable ( )
```

### 10.147.2.2 ~ImageApplyLookupTable()

```
gdcm::ImageApplyLookupTable::~~ImageApplyLookupTable ( )
```

## 10.147.3 Member Function Documentation

### 10.147.3.1 Apply()

```
bool gdcm::ImageApplyLookupTable::Apply ( )
```

Apply.

### 10.147.3.2 SetRGB8()

```
void gdcm::ImageApplyLookupTable::SetRGB8 (
    bool b )
```

RGB8 ?

The documentation for this class was generated from the following file:

- [gdcmImageApplyLookupTable.h](#)

## 10.148 gdcm::ImageChangePhotometricInterpretation Class Reference

[ImageChangePhotometricInterpretation](#) class.

```
#include <gdcmImageChangePhotometricInterpretation.h>
```

Inheritance diagram for gdcm::ImageChangePhotometricInterpretation:

Collaboration diagram for gdcm::ImageChangePhotometricInterpretation:

## Public Member Functions

- [ImageChangePhotometricInterpretation](#) ()
- [~ImageChangePhotometricInterpretation](#) ()=default
- bool [Change](#) ()  
*Change.*
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)  
*Set/Get requested [PhotometricInterpretation](#).*

## Static Public Member Functions

- template<typename T >  
static void [RGB2YBR](#) (T ybr[3], const T rgb[3], unsigned short storedbits=8)
- template<typename T >  
static void [YBR2RGB](#) (T rgb[3], const T ybr[3], unsigned short storedbits=8)

## Protected Member Functions

- bool [ChangeMonochrome](#) ()
- bool [ChangeRGB2YBR](#) ()
- bool [ChangeYBR2RGB](#) ()

## Additional Inherited Members

### 10.148.1 Detailed Description

[ImageChangePhotometricInterpretation](#) class.

Class to change the Photometric Interpretation of an input DICOM

### 10.148.2 Constructor & Destructor Documentation

#### 10.148.2.1 [ImageChangePhotometricInterpretation](#)()

```
gdcm::ImageChangePhotometricInterpretation::ImageChangePhotometricInterpretation ( ) [inline]
```

### 10.148.2.2 ~ImageChangePhotometricInterpretation()

```
gdcm::ImageChangePhotometricInterpretation::~~ImageChangePhotometricInterpretation ( ) [default]
```

## 10.148.3 Member Function Documentation

### 10.148.3.1 Change()

```
bool gdcm::ImageChangePhotometricInterpretation::Change ( )
```

Change.

### 10.148.3.2 ChangeMonochrome()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeMonochrome ( ) [protected]
```

### 10.148.3.3 ChangeRGB2YBR()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeRGB2YBR ( ) [protected]
```

### 10.148.3.4 ChangeYBR2RGB()

```
bool gdcm::ImageChangePhotometricInterpretation::ChangeYBR2RGB ( ) [protected]
```

### 10.148.3.5 GetPhotometricInterpretation()

```
const PhotometricInterpretation & gdcm::ImageChangePhotometricInterpretation::GetPhotometric↵  
Interpretation ( ) const [inline]
```

### 10.148.3.6 RGB2YBR()

```
template<typename T >
void gdcmm::ImageChangePhotometricInterpretation::RGB2YBR (
    T ybr[3],
    const T rgb[3],
    unsigned short storedbits = 8 ) [static]
```

colorspace conversion (based on CCIR Recommendation 601-2) -> T.871

References [gdcmm::Round\(\)](#).

### 10.148.3.7 SetPhotometricInterpretation()

```
void gdcmm::ImageChangePhotometricInterpretation::SetPhotometricInterpretation (
    PhotometricInterpretation const & pi ) [inline]
```

Set/Get requested [PhotometricInterpretation](#).

### 10.148.3.8 YBR2RGB()

```
template<typename T >
void gdcmm::ImageChangePhotometricInterpretation::YBR2RGB (
    T rgb[3],
    const T ybr[3],
    unsigned short storedbits = 8 ) [static]
```

References [gdcmm::Round\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmmImageChangePhotometricInterpretation.h](#)

## 10.149 gdcmm::ImageChangePlanarConfiguration Class Reference

[ImageChangePlanarConfiguration](#) class.

```
#include <gdcmmImageChangePlanarConfiguration.h>
```

Inheritance diagram for gdcmm::ImageChangePlanarConfiguration:

Collaboration diagram for gdcmm::ImageChangePlanarConfiguration:



## Public Member Functions

- [ImageChangePlanarConfiguration](#) ()
- [~ImageChangePlanarConfiguration](#) ()=default
- bool [Change](#) ()  
*Change.*
- unsigned int [GetPlanarConfiguration](#) () const
- void [SetPlanarConfiguration](#) (unsigned int pc)  
*Set/Get requested PlanarConfiguration.*

## Static Public Member Functions

- template<typename T >  
static size\_t [RGBPixelsToRGBPlanes](#) (T \*r, T \*g, T \*b, const T \*rgb, size\_t s)
- template<typename T >  
static size\_t [RGBPlanesToRGBPixels](#) (T \*out, const T \*r, const T \*g, const T \*b, size\_t s)

## Additional Inherited Members

### 10.149.1 Detailed Description

[ImageChangePlanarConfiguration](#) class.

Class to change the Planar configuration of an input DICOM By default it will change into the more usual representation: PlanarConfiguration = 0

### 10.149.2 Constructor & Destructor Documentation

#### 10.149.2.1 ImageChangePlanarConfiguration()

```
gdcm::ImageChangePlanarConfiguration::ImageChangePlanarConfiguration ( ) [inline]
```

#### 10.149.2.2 ~ImageChangePlanarConfiguration()

```
gdcm::ImageChangePlanarConfiguration::~~ImageChangePlanarConfiguration ( ) [default]
```

### 10.149.3 Member Function Documentation

### 10.149.3.1 Change()

```
bool gdcm::ImageChangePlanarConfiguration::Change ( )
```

Change.

### 10.149.3.2 GetPlanarConfiguration()

```
unsigned int gdcm::ImageChangePlanarConfiguration::GetPlanarConfiguration ( ) const [inline]
```

### 10.149.3.3 RGBPixelsToRGBPlanes()

```
template<typename T >
size_t gdcm::ImageChangePlanarConfiguration::RGBPixelsToRGBPlanes (
    T * r,
    T * g,
    T * b,
    const T * rgb,
    size_t s ) [static]
```

Convert a regular RGB pixel image (R,G,B,R,G,B...) into a planar R,G,B image (R,R...,G,G...B,B)

#### Warning

this works on a frame basis, you need to loop over all frames in multiple frames image to apply this function

### 10.149.3.4 RGBPlanesToRGBPixels()

```
template<typename T >
size_t gdcm::ImageChangePlanarConfiguration::RGBPlanesToRGBPixels (
    T * out,
    const T * r,
    const T * g,
    const T * b,
    size_t s ) [static]
```

s is the size of one plane (r,g or b). Thus the output buffer needs to be at least 3\*s bytes long s can be seen as the number of RGB pixels in the output

### 10.149.3.5 SetPlanarConfiguration()

```
void gdcm::ImageChangePlanarConfiguration::SetPlanarConfiguration (
    unsigned int pc ) [inline]
```

Set/Get requested PlanarConfiguration.

The documentation for this class was generated from the following file:

- [gdcmImageChangePlanarConfiguration.h](#)

## 10.150 gdcm::ImageChangeTransferSyntax Class Reference

[ImageChangeTransferSyntax](#) class.

```
#include <gdcmImageChangeTransferSyntax.h>
```

Inheritance diagram for gdcm::ImageChangeTransferSyntax:

Collaboration diagram for gdcm::ImageChangeTransferSyntax:

### Public Member Functions

- [ImageChangeTransferSyntax](#) ()
- [~ImageChangeTransferSyntax](#) ()=default
- bool [Change](#) ()  
*Change.*
- const [TransferSyntax](#) & [GetTransferSyntax](#) () const  
*Get Transfer Syntax.*
- void [SetCompressIconImage](#) (bool b)
- void [SetForce](#) (bool f)
- void [SetTransferSyntax](#) (const [TransferSyntax](#) &ts)  
*Set target Transfer Syntax.*
- void [SetUserCodec](#) ([ImageCodec](#) \*ic)

### Protected Member Functions

- bool [TryJPEG2000Codec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryJPEGCodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryJPEGLSCodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryRAWCodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)
- bool [TryRLECodec](#) (const [DataElement](#) &pixelde, [Bitmap](#) const &input, [Bitmap](#) &output)

## Additional Inherited Members

### 10.150.1 Detailed Description

[ImageChangeTransferSyntax](#) class.

Class to change the transfer syntax of an input DICOM

If only Force param is set but no input [TransferSyntax](#) is set, it is assumed that user only wants to inspect encapsulated stream (advanced dev. option).

When using UserCodec it is very important that the [TransferSyntax](#) (as set in SetTransferSyntax) is actually understood by UserCodec (ie. UserCodec->CanCode( TransferSyntax ) ). Otherwise the behavior is to use a default codec.

See also

[JPEGCodec](#) [JPEGLSCodec](#) [JPEG2000Codec](#)

Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

### 10.150.2 Constructor & Destructor Documentation

#### 10.150.2.1 ImageChangeTransferSyntax()

```
gdcm::ImageChangeTransferSyntax::ImageChangeTransferSyntax ( ) [inline]
```

#### 10.150.2.2 ~ImageChangeTransferSyntax()

```
gdcm::ImageChangeTransferSyntax::~~ImageChangeTransferSyntax ( ) [default]
```

### 10.150.3 Member Function Documentation

### 10.150.3.1 Change()

```
bool gdcm::ImageChangeTransferSyntax::Change ( )
```

Change.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

### 10.150.3.2 GetTransferSyntax()

```
const TransferSyntax & gdcm::ImageChangeTransferSyntax::GetTransferSyntax ( ) const [inline]
```

Get Transfer Syntax.

### 10.150.3.3 SetCompressIconImage()

```
void gdcm::ImageChangeTransferSyntax::SetCompressIconImage (
    bool b ) [inline]
```

Decide whether or not to also compress the Icon [Image](#) using the same Transfer Syntax. Default is to simply decompress icon image

#### Examples

[StandardizeFiles.cs](#).

### 10.150.3.4 SetForce()

```
void gdcm::ImageChangeTransferSyntax::SetForce (
    bool f ) [inline]
```

When target Transfer Syntax is identical to input target syntax, no operation is actually done. This is an issue when someone wants to re-compress using GDCM internal implementation a JPEG (for example) image

#### Examples

[StandardizeFiles.cs](#).

### 10.150.3.5 SetTransferSyntax()

```
void gdcm::ImageChangeTransferSyntax::SetTransferSyntax (
    const TransferSyntax & ts ) [inline]
```

Set target Transfer Syntax.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), and [StandardizeFiles.cs](#).

### 10.150.3.6 SetUserCodec()

```
void gdcm::ImageChangeTransferSyntax::SetUserCodec (
    ImageCodec * ic ) [inline]
```

Allow user to specify exactly which codec to use. this is needed to specify special qualities or compression option.

#### Warning

if the codec 'ic' is not compatible with the [TransferSyntax](#) requested, it will not be used. It is the user responsibility to check that `UserCodec->CanCode( TransferSyntax )`

#### Examples

[CompressLossyJPEG.cs](#).

### 10.150.3.7 TryJPEG2000Codec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEG2000Codec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output ) [protected]
```

### 10.150.3.8 TryJPEGCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEGCodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output ) [protected]
```

### 10.150.3.9 TryJPEGLSCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryJPEGLSCodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output ) [protected]
```

### 10.150.3.10 TryRAWCodec()

```
bool gdcm::ImageChangeTransferSyntax::TryRAWCodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output ) [protected]
```

### 10.150.3.11 TryRLECodec()

```
bool gdcm::ImageChangeTransferSyntax::TryRLECodec (
    const DataElement & pixelde,
    Bitmap const & input,
    Bitmap & output ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmImageChangeTransferSyntax.h](#)

## 10.151 gdcm::ImageCodec Class Reference

[ImageCodec](#).

```
#include <gdcmImageCodec.h>
```

Inheritance diagram for gdcm::ImageCodec:

Collaboration diagram for gdcm::ImageCodec:

## Public Member Functions

- [ImageCodec](#) ()
- [~ImageCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- bool [CleanupUnusedBits](#) (char \*data, size\_t datalen)
- virtual [ImageCodec](#) \* [Clone](#) () const =0
- bool [Decode](#) ([DataElement](#) const &is\_, [DataElement](#) &os) override  
*Decode.*
- const unsigned int \* [GetDimensions](#) () const
- virtual bool [GetHeaderInfo](#) (std::istream &is\_, [TransferSyntax](#) &ts)
- bool [GetLossyFlag](#) () const
- const [LookupTable](#) & [GetLUT](#) () const
- bool [GetNeedByteSwap](#) () const
- unsigned int [GetNumberOfDimensions](#) () const
- const [PhotometricInterpretation](#) & [GetPhotometricInterpretation](#) () const
- [PixelFormat](#) & [GetPixelFormat](#) ()
- const [PixelFormat](#) & [GetPixelFormat](#) () const
- unsigned int [GetPlanarConfiguration](#) () const
- bool [IsLossy](#) () const
- void [SetDimensions](#) (const std::vector< unsigned int > &d)
- void [SetDimensions](#) (const unsigned int d[3])
- void [SetLossyFlag](#) (bool l)
- void [SetLUT](#) ([LookupTable](#) const &lut)
- void [SetNeedByteSwap](#) (bool b)
- void [SetNeedOverlayCleanup](#) (bool b)
- void [SetNumberOfDimensions](#) (unsigned int dim)
- void [SetPhotometricInterpretation](#) ([PhotometricInterpretation](#) const &pi)
- virtual void [SetPixelFormat](#) ([PixelFormat](#) const &pf)
- void [SetPlanarConfiguration](#) (unsigned int pc)

## Protected Types

- typedef [SmartPointer](#)< [LookupTable](#) > [LUTPtr](#)

## Protected Member Functions

- virtual bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- virtual bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen)
- bool [DecodeByStreams](#) (std::istream &is\_, std::ostream &os) override
- bool [DoByteSwap](#) (std::istream &is\_, std::ostream &os)
- bool [DoInvertMonochrome](#) (std::istream &is\_, std::ostream &os)
- bool [DoOverlayCleanup](#) (std::istream &is\_, std::ostream &os)
- bool [DoPaddedCompositePixelCode](#) (std::istream &is\_, std::ostream &os)
- bool [DoPlanarConfiguration](#) (std::istream &is\_, std::ostream &os)



- bool [DoSimpleCopy](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBR](#) (std::istream &is\_, std::ostream &os)
- bool [DoYBRFull422](#) (std::istream &is\_, std::ostream &os)
- virtual bool [IsFrameEncoder](#) ()
- virtual bool [IsRowEncoder](#) ()
- virtual bool [IsValid](#) ([PhotometricInterpretation](#) const &pi)
- virtual bool [StartEncode](#) (std::ostream &os)
- virtual bool [StopEncode](#) (std::ostream &os)

## Protected Attributes

- unsigned int [Dimensions](#) [3]
- bool [LossyFlag](#)
- [LUTPtr](#) LUT
- bool [NeedByteSwap](#)
- bool [NeedOverlayCleanup](#)
- unsigned int [NumberOfDimensions](#)
- [PixelFormat](#) PF
- [PhotometricInterpretation](#) PI
- unsigned int [PlanarConfiguration](#)
- bool [RequestPaddedCompositePixelCode](#)
- bool [RequestPlanarConfiguration](#)

## Friends

- class [FileChangeTransferSyntax](#)
- class [ImageChangePhotometricInterpretation](#)

### 10.151.1 Detailed Description

[ImageCodec](#).

#### Note

Main codec, this is a central place for all implementation

#### Examples

[FileChangeTSLossy.cs](#).

### 10.151.2 Member Typedef Documentation

### 10.151.2.1 LUTPtr

```
typedef SmartPointer<LookupTable> gdcM::ImageCodec::LUTPtr [protected]
```

## 10.151.3 Constructor & Destructor Documentation

### 10.151.3.1 ImageCodec()

```
gdcM::ImageCodec::ImageCodec ( )
```

### 10.151.3.2 ~ImageCodec()

```
gdcM::ImageCodec::~~ImageCodec ( ) [override]
```

## 10.151.4 Member Function Documentation

### 10.151.4.1 AppendFrameEncode()

```
virtual bool gdcM::ImageCodec::AppendFrameEncode (  
    std::ostream & out,  
    const char * data,  
    size_t datalen ) [protected], [virtual]
```

Reimplemented in [gdcM::JPEG2000Codec](#), [gdcM::JPEGCodec](#), [gdcM::JPEGLSCodec](#), and [gdcM::RLECodec](#).

### 10.151.4.2 AppendRowEncode()

```
virtual bool gdcM::ImageCodec::AppendRowEncode (  
    std::ostream & out,  
    const char * data,  
    size_t datalen ) [protected], [virtual]
```

Reimplemented in [gdcM::JPEG2000Codec](#), [gdcM::JPEGCodec](#), [gdcM::JPEGLSCodec](#), and [gdcM::RLECodec](#).

#### 10.151.4.3 CanCode()

```
bool gdcm::ImageCodec::CanCode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implements [gdcm::Coder](#).

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.4 CanDecode()

```
bool gdcm::ImageCodec::CanDecode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implements [gdcm::Decoder](#).

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.5 CleanupUnusedBits()

```
bool gdcm::ImageCodec::CleanupUnusedBits (
    char * data,
    size_t datalen )
```

#### 10.151.4.6 Clone()

```
virtual ImageCodec * gdcm::ImageCodec::Clone ( ) const [pure virtual]
```

Implemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PGXCodec](#), [gdcm::PNMCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.7 Decode()

```
bool gdcm::ImageCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::Decoder](#).

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), [gdcm::KAKADUCodec](#), [gdcm::PVRGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.8 DecodeByStreams()

```
bool gdcm::ImageCodec::DecodeByStreams (
    std::istream & is_,
    std::ostream & os ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::Decoder](#).

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), [gdcm::JPEG2000Codec](#), [gdcm::JPEG8Codec](#), [gdcm::JPEGCodec](#), [gdcm::RAWCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.9 DoByteSwap()

```
bool gdcm::ImageCodec::DoByteSwap (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.10 DoInvertMonochrome()

```
bool gdcm::ImageCodec::DoInvertMonochrome (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.11 DoOverlayCleanup()

```
bool gdcm::ImageCodec::DoOverlayCleanup (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.12 DoPaddedCompositePixelCode()

```
bool gdcm::ImageCodec::DoPaddedCompositePixelCode (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.13 DoPlanarConfiguration()

```
bool gdcm::ImageCodec::DoPlanarConfiguration (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.14 DoSimpleCopy()

```
bool gdcm::ImageCodec::DoSimpleCopy (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.15 DoYBR()

```
bool gdcm::ImageCodec::DoYBR (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.16 DoYBRFull422()

```
bool gdcm::ImageCodec::DoYBRFull422 (
    std::istream & is_,
    std::ostream & os ) [protected]
```

#### 10.151.4.17 GetDimensions()

```
const unsigned int * gdcM::ImageCodec::GetDimensions ( ) const [inline]
```

#### 10.151.4.18 GetHeaderInfo()

```
virtual bool gdcM::ImageCodec::GetHeaderInfo (
    std::istream & is_,
    TransferSyntax & ts ) [virtual]
```

Reimplemented in [gdcM::JPEG12Codec](#), [gdcM::JPEG16Codec](#), [gdcM::JPEG2000Codec](#), [gdcM::JPEG8Codec](#), [gdcM::JPEGCodec](#), [gdcM::JPEGLSCCodec](#), [gdcM::PGXCodec](#), [gdcM::PNMCodec](#), [gdcM::RAWCodec](#), and [gdcM::RLECodec](#).

#### 10.151.4.19 GetLossyFlag()

```
bool gdcM::ImageCodec::GetLossyFlag ( ) const
```

#### 10.151.4.20 GetLUT()

```
const LookupTable & gdcM::ImageCodec::GetLUT ( ) const [inline]
```

#### 10.151.4.21 GetNeedByteSwap()

```
bool gdcM::ImageCodec::GetNeedByteSwap ( ) const [inline]
```

#### 10.151.4.22 GetNumberOfDimensions()

```
unsigned int gdcM::ImageCodec::GetNumberOfDimensions ( ) const
```

#### 10.151.4.23 GetPhotometricInterpretation()

```
const PhotometricInterpretation & gdcm::ImageCodec::GetPhotometricInterpretation ( ) const
```

#### 10.151.4.24 GetPixelFormat() [1/2]

```
PixelFormat & gdcm::ImageCodec::GetPixelFormat ( ) [inline]
```

##### Examples

[GetJPEGSamplePrecision.cxx](#).

#### 10.151.4.25 GetPixelFormat() [2/2]

```
const PixelFormat & gdcm::ImageCodec::GetPixelFormat ( ) const [inline]
```

#### 10.151.4.26 GetPlanarConfiguration()

```
unsigned int gdcm::ImageCodec::GetPlanarConfiguration ( ) const [inline]
```

#### 10.151.4.27 IsFrameEncoder()

```
virtual bool gdcm::ImageCodec::IsFrameEncoder ( ) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.28 IsLossy()

```
bool gdcm::ImageCodec::IsLossy ( ) const
```

**10.151.4.29 IsRowEncoder()**

```
virtual bool gdcm::ImageCodec::IsRowEncoder ( ) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

**10.151.4.30 IsValid()**

```
virtual bool gdcm::ImageCodec::IsValid (
    PhotometricInterpretation const & pi ) [protected], [virtual]
```

Reimplemented in [gdcm::JPEGCodec](#).

**10.151.4.31 SetDimensions() [1/2]**

```
void gdcm::ImageCodec::SetDimensions (
    const std::vector< unsigned int > & d )
```

**10.151.4.32 SetDimensions() [2/2]**

```
void gdcm::ImageCodec::SetDimensions (
    const unsigned int d[3] )
```

**Examples**

[ExtractIconFromFile.cxx](#).

**10.151.4.33 SetLossyFlag()**

```
void gdcm::ImageCodec::SetLossyFlag (
    bool l )
```



#### 10.151.4.34 SetLUT()

```
void gdcm::ImageCodec::SetLUT (
    LookupTable const & lut ) [inline]
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.151.4.35 SetNeedByteSwap()

```
void gdcm::ImageCodec::SetNeedByteSwap (
    bool b ) [inline]
```

#### 10.151.4.36 SetNeedOverlayCleanup()

```
void gdcm::ImageCodec::SetNeedOverlayCleanup (
    bool b ) [inline]
```

#### 10.151.4.37 SetNumberOfDimensions()

```
void gdcm::ImageCodec::SetNumberOfDimensions (
    unsigned int dim )
```

#### 10.151.4.38 SetPhotometricInterpretation()

```
void gdcm::ImageCodec::SetPhotometricInterpretation (
    PhotometricInterpretation const & pi )
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.151.4.39 SetPixelFormat()

```
virtual void gdcm::ImageCodec::SetPixelFormat (
    PixelFormat const & pf ) [inline], [virtual]
```

Reimplemented in [gdcm::JPEGCodec](#).

#### Examples

[ExtractIconFromFile.cxx](#).

#### 10.151.4.40 SetPlanarConfiguration()

```
void gdcm::ImageCodec::SetPlanarConfiguration (
    unsigned int pc ) [inline]
```

#### 10.151.4.41 StartEncode()

```
virtual bool gdcm::ImageCodec::StartEncode (
    std::ostream & os ) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

#### 10.151.4.42 StopEncode()

```
virtual bool gdcm::ImageCodec::StopEncode (
    std::ostream & os ) [protected], [virtual]
```

Reimplemented in [gdcm::JPEG2000Codec](#), [gdcm::JPEGCodec](#), [gdcm::JPEGLSCodec](#), and [gdcm::RLECodec](#).

### 10.151.5 Friends And Related Function Documentation

### 10.151.5.1 FileChangeTransferSyntax

```
friend class FileChangeTransferSyntax [friend]
```

This is a high level API to encode in a streaming fashion. Each plugin will handle differently the caching mechanism so that a limited memory is used when compressing dataset. [Codec](#) will fall into two categories:

- Full row encoder: only a single scanline (row) of data is needed to be loaded at a time;
- Full frame encoder (default): a complete frame (row x col) is needed to be loaded at a time

### 10.151.5.2 ImageChangePhotometricInterpretation

```
friend class ImageChangePhotometricInterpretation [friend]
```

## 10.151.6 Member Data Documentation

### 10.151.6.1 Dimensions

```
unsigned int gdcm::ImageCodec::Dimensions[3] [protected]
```

### 10.151.6.2 LossyFlag

```
bool gdcm::ImageCodec::LossyFlag [protected]
```

### 10.151.6.3 LUT

```
LUTPtr gdcm::ImageCodec::LUT [protected]
```

### 10.151.6.4 NeedByteSwap

```
bool gdcm::ImageCodec::NeedByteSwap [protected]
```

#### 10.151.6.5 NeedOverlayCleanup

```
bool gdcm::ImageCodec::NeedOverlayCleanup [protected]
```

#### 10.151.6.6 NumberOfDimensions

```
unsigned int gdcm::ImageCodec::NumberOfDimensions [protected]
```

#### 10.151.6.7 PF

```
PixelFormat gdcm::ImageCodec::PF [protected]
```

#### 10.151.6.8 PI

```
PhotometricInterpretation gdcm::ImageCodec::PI [protected]
```

#### 10.151.6.9 PlanarConfiguration

```
unsigned int gdcm::ImageCodec::PlanarConfiguration [protected]
```

#### 10.151.6.10 RequestPaddedCompositePixelCode

```
bool gdcm::ImageCodec::RequestPaddedCompositePixelCode [protected]
```

#### 10.151.6.11 RequestPlanarConfiguration

```
bool gdcm::ImageCodec::RequestPlanarConfiguration [protected]
```

The documentation for this class was generated from the following file:

- [gdcmImageCodec.h](#)

## 10.152 gdcm::ImageConverter Class Reference

[Image](#) Converter.

```
#include <gdcmImageConverter.h>
```

### Public Member Functions

- [ImageConverter](#) ()
- [~ImageConverter](#) ()
- void [Convert](#) ()
- const [Image](#) & [GetOutput](#) () const
- void [SetInput](#) ([Image](#) const &input)

### 10.152.1 Detailed Description

[Image](#) Converter.

#### Note

This is the class used to convert from on [Image](#) to another This is typically used to convert let say YBR JPEG compressed [Image](#) to a RAW RGB [Image](#). So that the buffer can be directly pass to third party application. This filter is application level and not integrated directly in GDCM

### 10.152.2 Constructor & Destructor Documentation

#### 10.152.2.1 ImageConverter()

```
gdcm::ImageConverter::ImageConverter ( )
```

#### 10.152.2.2 ~ImageConverter()

```
gdcm::ImageConverter::~ImageConverter ( )
```

### 10.152.3 Member Function Documentation

### 10.152.3.1 Convert()

```
void gdcm::ImageConverter::Convert ( )
```

### 10.152.3.2 GetOutput()

```
const Image & gdcm::ImageConverter::GetOutput ( ) const
```

### 10.152.3.3 SetInput()

```
void gdcm::ImageConverter::SetInput (
    Image const & input )
```

The documentation for this class was generated from the following file:

- [gdcmImageConverter.h](#)

## 10.153 gdcm::ImageFragmentSplitter Class Reference

[ImageFragmentSplitter](#) class.

```
#include <gdcmImageFragmentSplitter.h>
```

Inheritance diagram for gdcm::ImageFragmentSplitter:

Collaboration diagram for gdcm::ImageFragmentSplitter:

### Public Member Functions

- [ImageFragmentSplitter](#) ()
- [~ImageFragmentSplitter](#) ()=default
- unsigned int [GetFragmentSizeMax](#) () const
- void [SetForce](#) (bool f)
- void [SetFragmentSizeMax](#) (unsigned int fragsize)  
*FragmentSizeMax needs to be an even number.*
- bool [Split](#) ()  
*Split.*

## Additional Inherited Members

### 10.153.1 Detailed Description

[ImageFragmentSplitter](#) class.

For single frame image, DICOM standard allow splitting the frame into multiple fragments

### 10.153.2 Constructor & Destructor Documentation

#### 10.153.2.1 ImageFragmentSplitter()

```
gdcm::ImageFragmentSplitter::ImageFragmentSplitter ( ) [inline]
```

#### 10.153.2.2 ~ImageFragmentSplitter()

```
gdcm::ImageFragmentSplitter::~~ImageFragmentSplitter ( ) [default]
```

### 10.153.3 Member Function Documentation

#### 10.153.3.1 GetFragmentSizeMax()

```
unsigned int gdcm::ImageFragmentSplitter::GetFragmentSizeMax ( ) const [inline]
```

#### 10.153.3.2 SetForce()

```
void gdcm::ImageFragmentSplitter::SetForce (
    bool f ) [inline]
```

When file already has all it's segment < FragmentSizeMax there is not need to run the filter. Unless the user explicitly say 'force' recomputation !

### 10.153.3.3 SetFragmentSizeMax()

```
void gdcmm::ImageFragmentSplitter::SetFragmentSizeMax (
    unsigned int fragsize )
```

FragmentSizeMax needs to be an even number.

### 10.153.3.4 Split()

```
bool gdcmm::ImageFragmentSplitter::Split ( )
```

Split.

The documentation for this class was generated from the following file:

- [gdcmmImageFragmentSplitter.h](#)

## 10.154 gdcmm::ImageHelper Class Reference

[ImageHelper](#) (internal class, not intended for user level)

```
#include <gdcmmImageHelper.h>
```

### Static Public Member Functions

- static [MediaStorage](#) [ComputeMediaStorageFromModality](#) (const char \*modality, unsigned int dimension=2, [PixelFormat](#) const &pf=[PixelFormat](#)(), [PhotometricInterpretation](#) const &pi=[PhotometricInterpretation](#)(), double rescaleintercept=0, double rescaleslope=1)  
*Moved from [MediaStorage](#) here, since we need extra info stored in [PixelFormat](#) & [PhotometricInterpretation](#).*
- static bool [ComputeSpacingFromImagePositionPatient](#) (const std::vector< double > &imageposition, std::vector< double > &spacing)  
*DO NOT USE.*
- static std::vector< unsigned int > [GetDimensionsValue](#) (const [File](#) &f)
- static bool [GetDirectionCosinesFromDataSet](#) ([DataSet](#) const &ds, std::vector< double > &dircos)
- static std::vector< double > [GetDirectionCosinesValue](#) ([File](#) const &f)
- static bool [GetForcePixelSpacing](#) ()
- static bool [GetForceRescaleInterceptSlope](#) ()
- static [SmartPointer< LookupTable >](#) [GetLUT](#) ([File](#) const &f)  
*returns the lookup table of an image file*
- static std::vector< double > [GetOriginValue](#) ([File](#) const &f)  
*Set/Get Origin (IPP) from/to a file.*
- static [PhotometricInterpretation](#) [GetPhotometricInterpretationValue](#) ([File](#) const &f)
- static [PixelFormat](#) [GetPixelFormatValue](#) (const [File](#) &f)
- static unsigned int [GetPlanarConfigurationValue](#) (const [File](#) &f)



- static bool [GetPMSRescaleInterceptSlope](#) ()
- static const [ByteValue](#) \* [GetPointerFromElement](#) ([Tag](#) const &tag, [File](#) const &f)
- static bool [GetRealWorldValueMappingContent](#) ([File](#) const &f, [RealWorldValueMappingContent](#) &rwvmc)
- static std::vector< double > [GetRescaleInterceptSlopeValue](#) ([File](#) const &f)
- static std::vector< double > [GetSpacingValue](#) ([File](#) const &f)
- *Set/Get [Spacing](#) from/to a [File](#).*
- static void [SetDimensionsValue](#) ([File](#) &f, const [Pixmap](#) &img)
- static void [SetDirectionCosinesValue](#) ([DataSet](#) &ds, const std::vector< double > &dircos)
- static void [SetForcePixelSpacing](#) (bool)
- static void [SetForceRescaleInterceptSlope](#) (bool)
- static void [SetOriginValue](#) ([DataSet](#) &ds, const [Image](#) &img)
- static void [SetPMSRescaleInterceptSlope](#) (bool)
- static void [SetRescaleInterceptSlopeValue](#) ([File](#) &f, const [Image](#) &img)
- static void [SetSpacingValue](#) ([DataSet](#) &ds, const std::vector< double > &spacing)

## Static Protected Member Functions

- static [Tag](#) [GetSpacingTagFromMediaStorage](#) ([MediaStorage](#) const &ms)
- static [Tag](#) [GetZSpacingTagFromMediaStorage](#) ([MediaStorage](#) const &ms)

### 10.154.1 Detailed Description

[ImageHelper](#) (internal class, not intended for user level)

Helper for writing World images in DICOM. DICOM has a 'template' approach to image where MR [Image](#) Storage are distinct object from Enhanced MR [Image](#) Storage. For example the Pixel [Spacing](#) in one object is not at the same position (ie [Tag](#)) as in the other this class is the central (read: fragile) place where all the dispatching is done from a unified view of a world image (typically VTK or ITK point of view) down to the low level DICOM point of view.

#### Warning

: do not expect the API of this class to be maintained at any point, since as Modalities are added the API might have to be augmented or behavior changed to cope with new modalities.

#### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [ExtractOneFrame.cs](#).

### 10.154.2 Member Function Documentation

### 10.154.2.1 ComputeMediaStorageFromModality()

```
static MediaStorage gdcm::ImageHelper::ComputeMediaStorageFromModality (
    const char * modality,
    unsigned int dimension = 2,
    PixelFormat const & pf = PixelFormat (),
    PhotometricInterpretation const & pi = PhotometricInterpretation (),
    double rescaleintercept = 0,
    double rescaleslope = 1 ) [static]
```

Moved from [MediaStorage](#) here, since we need extra info stored in [PixelFormat](#) & [PhotometricInterpretation](#).

### 10.154.2.2 ComputeSpacingFromImagePositionPatient()

```
static bool gdcm::ImageHelper::ComputeSpacingFromImagePositionPatient (
    const std::vector< double > & imageposition,
    std::vector< double > & spacing ) [static]
```

DO NOT USE.

### 10.154.2.3 GetDimensionsValue()

```
static std::vector< unsigned int > gdcm::ImageHelper::GetDimensionsValue (
    const File & f ) [static]
```

This function checks tags (0x0028, 0x0010) and (0x0028, 0x0011) for the rows and columns of the image in pixels (as opposed to actual distances). The output is {col , row}

#### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.154.2.4 GetDirectionCosinesFromDataSet()

```
static bool gdcm::ImageHelper::GetDirectionCosinesFromDataSet (
    DataSet const & ds,
    std::vector< double > & dircos ) [static]
```

#### 10.154.2.5 GetDirectionCosinesValue()

```
static std::vector< double > gdcm::ImageHelper::GetDirectionCosinesValue (
    File const & f ) [static]
```

Get Direction Cosines (IOP) from/to a file Requires a file because mediastorage must be known

#### 10.154.2.6 GetForcePixelSpacing()

```
static bool gdcm::ImageHelper::GetForcePixelSpacing ( ) [static]
```

#### 10.154.2.7 GetForceRescaleInterceptSlope()

```
static bool gdcm::ImageHelper::GetForceRescaleInterceptSlope ( ) [static]
```

#### 10.154.2.8 GetLUT()

```
static SmartPointer< LookupTable > gdcm::ImageHelper::GetLUT (
    File const & f ) [static]
```

returns the lookup table of an image file

#### 10.154.2.9 GetOriginValue()

```
static std::vector< double > gdcm::ImageHelper::GetOriginValue (
    File const & f ) [static]
```

Set/Get Origin (IPP) from/to a file.

#### 10.154.2.10 GetPhotometricInterpretationValue()

```
static PhotometricInterpretation gdcm::ImageHelper::GetPhotometricInterpretationValue (
    File const & f ) [static]
```

#### Examples

[ExtractImageRegion.cs](#).

#### 10.154.2.11 GetPixelFormatValue()

```
static PixelFormat gdcm::ImageHelper::GetPixelFormatValue (
    const File & f ) [static]
```

This function returns pixel information about an image from its dataset That includes samples per pixel and bit depth (in that order)

#### 10.154.2.12 GetPlanarConfigurationValue()

```
static unsigned int gdcm::ImageHelper::GetPlanarConfigurationValue (
    const File & f ) [static]
```

#### 10.154.2.13 GetPMSRescaleInterceptSlope()

```
static bool gdcm::ImageHelper::GetPMSRescaleInterceptSlope ( ) [static]
```

#### 10.154.2.14 GetPointerFromElement()

```
static const ByteValue * gdcm::ImageHelper::GetPointerFromElement (
    Tag const & tag,
    File const & f ) [static]
```

#### 10.154.2.15 GetRealWorldValueMappingContent()

```
static bool gdcm::ImageHelper::GetRealWorldValueMappingContent (
    File const & f,
    RealWorldValueMappingContent & rwvmc ) [static]
```

#### 10.154.2.16 GetRescaleInterceptSlopeValue()

```
static std::vector< double > gdcm::ImageHelper::GetRescaleInterceptSlopeValue (
    File const & f ) [static]
```

Set/Get shift/scale from/to a file

##### Warning

this function reads/sets the Slope/Intercept in appropriate class storage, but also Grid Scaling in RT Dose Storage  
Can't take a dataset because the mediastorage of the file must be known

#### 10.154.2.17 GetSpacingTagFromMediaStorage()

```
static Tag gdcm::ImageHelper::GetSpacingTagFromMediaStorage (
    MediaStorage const & ms ) [static], [protected]
```

#### 10.154.2.18 GetSpacingValue()

```
static std::vector< double > gdcm::ImageHelper::GetSpacingValue (
    File const & f ) [static]
```

Set/Get [Spacing](#) from/to a [File](#).

#### 10.154.2.19 GetZSpacingTagFromMediaStorage()

```
static Tag gdcm::ImageHelper::GetZSpacingTagFromMediaStorage (
    MediaStorage const & ms ) [static], [protected]
```

#### 10.154.2.20 SetDimensionsValue()

```
static void gdcm::ImageHelper::SetDimensionsValue (
    File & f,
    const Pixmap & img ) [static]
```

#### 10.154.2.21 SetDirectionCosinesValue()

```
static void gdcm::ImageHelper::SetDirectionCosinesValue (
    DataSet & ds,
    const std::vector< double > & dircos ) [static]
```

Set Direction Cosines (IOP) from/to a file When [IOD](#) does not defines what is IOP (eg. typically Secondary Capture [Image](#) Storage) this call will simply remove the IOP attribute. Else in case of MR/CT image storage, this call will properly lookup the correct attribute to store the IOP.

#### 10.154.2.22 SetForcePixelSpacing()

```
static void gdcm::ImageHelper::SetForcePixelSpacing (
    bool ) [static]
```

GDCM 1.x compatibility issue: When using ReWrite an MR [Image](#) Storage would be rewritten as Secondary Capture [Object](#) while still having a Pixel [Spacing](#) tag (0028,0030). If you have deal with those files, use this very special flag to handle them Unless explicitly set elsewhere by the standard, it will use value from 0028,0030 / 0018,0088 for the Pixel [Spacing](#) of the [Image](#)

#### 10.154.2.23 SetForceRescaleInterceptSlope()

```
static void gdcm::ImageHelper::SetForceRescaleInterceptSlope (
    bool ) [static]
```

GDCM 1.x compatibility issue: Do not use anymore. This hack was used for some MR [Image](#) Storage generated by Philips Modality. When "Combine MR Rescaling" is set to TRUE, rescaling is removed. But when set to FALSE, the Modality LUT was exported. Internally GDCM now handles this gracefully.

#### 10.154.2.24 SetOriginValue()

```
static void gdcm::ImageHelper::SetOriginValue (
    DataSet & ds,
    const Image & img ) [static]
```

#### 10.154.2.25 SetPMSRescaleInterceptSlope()

```
static void gdcm::ImageHelper::SetPMSRescaleInterceptSlope (
    bool ) [static]
```

Since GDCM 2.6.1 Philips Medical [System](#) are read using the Private Field For Rescale Slope/Intercept by default. This mechanism can be deactivated using the following API: This option has no effect when ForceRescaleInterceptSlope is set to true GDCM will only read those private attribute but never write them out.

#### 10.154.2.26 SetRescaleInterceptSlopeValue()

```
static void gdcm::ImageHelper::SetRescaleInterceptSlopeValue (
    File & f,
    const Image & img ) [static]
```

### 10.154.2.27 SetSpacingValue()

```
static void gdcm::ImageHelper::SetSpacingValue (
    DataSet & ds,
    const std::vector< double > & spacing ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmImageHelper.h](#)

## 10.155 gdcm::ImageReader Class Reference

[ImageReader](#).

```
#include <gdcmImageReader.h>
```

Inheritance diagram for gdcm::ImageReader:

Collaboration diagram for gdcm::ImageReader:

### Public Member Functions

- [ImageReader](#) ()
- [~ImageReader](#) () override
- [Image](#) & [GetImage](#) ()
- const [Image](#) & [GetImage](#) () const  
*Return the read image.*
- bool [Read](#) () override

### Protected Member Functions

- bool [ReadACRNEMAIImage](#) () override
- bool [ReadImage](#) ([MediaStorage](#) const &ms) override

### Additional Inherited Members

#### 10.155.1 Detailed Description

[ImageReader](#).

#### Note

its role is to convert the DICOM [DataSet](#) into a [Image](#) representation [Image](#) is different from [Pixmap](#) has it has a position and a direction in Space.

#### See also

[Image](#)

#### Examples

[BasicImageAnonymizer.cs](#), [CheckBigEndianBug.cxx](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), and [threadgdcm.cxx](#).

## 10.155.2 Constructor & Destructor Documentation

### 10.155.2.1 ImageReader()

```
gdcm::ImageReader::ImageReader ( )
```

### 10.155.2.2 ~ImageReader()

```
gdcm::ImageReader::~~ImageReader ( ) [override]
```

## 10.155.3 Member Function Documentation

### 10.155.3.1 GetImage() [1/2]

```
Image & gdcm::ImageReader::GetImage ( )
```

### 10.155.3.2 GetImage() [2/2]

```
const Image & gdcm::ImageReader::GetImage ( ) const
```

Return the read image.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [ExtractImageRegionWithLUT.cs](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), and [threadgdcm.cxx](#).



### 10.155.3.3 Read()

```
bool gdcm::ImageReader::Read ( ) [override], [virtual]
```

Read the DICOM image. There are two reason for failure:

1. The input filename is not DICOM
2. The input DICOM file does not contains an [Image](#).

Reimplemented from [gdcm::Reader](#).

Reimplemented in [gdcm::ImageRegionReader](#).

#### Examples

[BasicImageAnonymizer.cs](#), [CheckBigEndianBug.cxx](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [DecompressImage.cs](#), [ExtractIconFromFile.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [ReadMultiTimesException.cxx](#), [RescaleImage.cs](#), and [threadgdcm.cxx](#).

### 10.155.3.4 ReadACRNEMAIImage()

```
bool gdcm::ImageReader::ReadACRNEMAIImage ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::PixmapReader](#).

### 10.155.3.5 ReadImage()

```
bool gdcm::ImageReader::ReadImage (
    MediaStorage const & ms ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::PixmapReader](#).

The documentation for this class was generated from the following file:

- [gdcmImageReader.h](#)

## 10.156 gdcm::ImageRegionReader Class Reference

[ImageRegionReader](#).

```
#include <gdcmImageRegionReader.h>
```

Inheritance diagram for gdcm::ImageRegionReader:

Collaboration diagram for gdcm::ImageRegionReader:

### Public Member Functions

- [ImageRegionReader](#) ()
- [~ImageRegionReader](#) () override
- [size\\_t ComputeBufferLength](#) () const
- [Region](#) const & [GetRegion](#) () const
- [bool ReadInformation](#) ()
- [bool ReadIntoBuffer](#) (char \*inreadbuffer, [size\\_t](#) buflen)
- [void SetRegion](#) ([Region](#) const &region)

*Set/Get [Region](#) to be read.*

### Protected Member Functions

- [bool Read](#) () override

*To prevent user from calling super class [Read\(\)](#) function.*

### Additional Inherited Members

#### 10.156.1 Detailed Description

[ImageRegionReader](#).

This class is able to read a region from a DICOM file containing an image. This implementation requires that the information stored in the DICOM header are consistent with what is in the encapsulated Pixel Data. This is technically not required by DICOM standard, which makes this implementation illegal with regards to the famous JPEG note: [http://dicom.nema.org/medical/dicom/current/output/chtml/part05/sect\\_8.2.html#para\\_4bcb841e-c6bf-4e26-82a5-3fad3c942da0](http://dicom.nema.org/medical/dicom/current/output/chtml/part05/sect_8.2.html#para_4bcb841e-c6bf-4e26-82a5-3fad3c942da0)

See also

[ImageReader](#)

Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [TemplateEmptyImage.cxx](#).

## 10.156.2 Constructor & Destructor Documentation

### 10.156.2.1 ImageRegionReader()

```
gdcm::ImageRegionReader::ImageRegionReader ( )
```

### 10.156.2.2 ~ImageRegionReader()

```
gdcm::ImageRegionReader::~~ImageRegionReader ( ) [override]
```

## 10.156.3 Member Function Documentation

### 10.156.3.1 ComputeBufferLength()

```
size_t gdcm::ImageRegionReader::ComputeBufferLength ( ) const
```

Explicit call which will compute the minimal buffer length that can hold the whole uncompressed image as defined by [Region](#) region.

#### Returns

0 upon error

### 10.156.3.2 GetRegion()

```
Region const & gdcm::ImageRegionReader::GetRegion ( ) const
```

### 10.156.3.3 Read()

```
bool gdcm::ImageRegionReader::Read ( ) [override], [protected], [virtual]
```

To prevent user from calling super class [Read\(\)](#) function.

Reimplemented from [gdcm::ImageReader](#).

#### 10.156.3.4 ReadInformation()

```
bool gdcm::ImageRegionReader::ReadInformation ( )
```

Read meta information (not Pixel Data) from the DICOM file.

##### Returns

false upon error

##### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), and [TemplateEmptyImage.cxx](#).

#### 10.156.3.5 ReadIntoBuffer()

```
bool gdcm::ImageRegionReader::ReadIntoBuffer (
    char * inreadbuffer,
    size_t buflen )
```

Read into buffer: For Python, the `buflen` param is deduced directly from the input bytearray passed as parameter (function only takes one param).

##### Returns

false upon error

##### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

#### 10.156.3.6 SetRegion()

```
void gdcm::ImageRegionReader::SetRegion (
    Region const & region )
```

Set/Get [Region](#) to be read.

##### Examples

[ExtractImageRegion.cs](#), and [ExtractImageRegionWithLUT.cs](#).

The documentation for this class was generated from the following file:

- [gdcmImageRegionReader.h](#)

## 10.157 gdcm::ImageToImageFilter Class Reference

[ImageToImageFilter](#) class.

```
#include <gdcmImageToImageFilter.h>
```

Inheritance diagram for gdcm::ImageToImageFilter:

Collaboration diagram for gdcm::ImageToImageFilter:

### Public Member Functions

- [ImageToImageFilter](#) ()
- [~ImageToImageFilter](#) ()=default
- [Image](#) & [GetInput](#) ()
- const [Image](#) & [GetOutput](#) () const

*Get Output image.*

### Additional Inherited Members

#### 10.157.1 Detailed Description

[ImageToImageFilter](#) class.

Super class for all filter taking an image and producing an output image

#### 10.157.2 Constructor & Destructor Documentation

##### 10.157.2.1 ImageToImageFilter()

```
gdcm::ImageToImageFilter::ImageToImageFilter ( )
```

##### 10.157.2.2 ~ImageToImageFilter()

```
gdcm::ImageToImageFilter::~~ImageToImageFilter ( ) [default]
```

#### 10.157.3 Member Function Documentation

### 10.157.3.1 GetInput()

[Image](#) & `gdcm::ImageToImageFilter::GetInput ( )`

### 10.157.3.2 GetOutput()

`const Image & gdcm::ImageToImageFilter::GetOutput ( ) const`

Get Output image.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), and [CompressLossyJPEG.cs](#).

The documentation for this class was generated from the following file:

- [gdcmImageToImageFilter.h](#)

## 10.158 gdcm::ImageWriter Class Reference

[ImageWriter](#).

```
#include <gdcmImageWriter.h>
```

Inheritance diagram for `gdcm::ImageWriter`:

Collaboration diagram for `gdcm::ImageWriter`:

### Public Member Functions

- [ImageWriter](#) ()
- [~ImageWriter](#) () override
- [MediaStorage ComputeTargetMediaStorage](#) ()
- `const Image & GetImage ()` const override
- [Image](#) & [GetImage](#) () override
- `bool Write ()` override

*Write.*

## Additional Inherited Members

### 10.158.1 Detailed Description

[ImageWriter](#).

This is an extended version of the [PixmapWriter](#). Pay attention that:

1. It will populate missing attribute for Secondary Capture [Image](#) Storage instances,
2. It may also change an input MR [Image](#) Storage instance into a pseudo Enhanced MR [Image](#) Storage instance whenever Modality LUT is required.
3. Some [DataElement](#) related to [gdcm::Image](#) may be slightly altered.

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

### 10.158.2 Constructor & Destructor Documentation

#### 10.158.2.1 ImageWriter()

```
gdcm::ImageWriter::ImageWriter ( )
```

#### 10.158.2.2 ~ImageWriter()

```
gdcm::ImageWriter::~ImageWriter ( ) [override]
```

### 10.158.3 Member Function Documentation

### 10.158.3.1 ComputeTargetMediaStorage()

`MediaStorage` `gdcm::ImageWriter::ComputeTargetMediaStorage ( )`

internal function used to compute a target `MediaStorage` the most appropriate User may want to call this function ahead of time (before Write)

#### Examples

`TemplateEmptyImage.cxx`.

### 10.158.3.2 GetImage() [1/2]

`const Image & gdcm::ImageWriter::GetImage ( ) const` `[inline]`, `[override]`, `[virtual]`

Set/Get `Image` to be written It will overwrite anything `Image` infos found in `DataSet` (see parent class to see how to pass dataset)

Reimplemented from `gdcm::PixmapWriter`.

#### Examples

`CreateARGBImage.cxx`, `CreateCMYKImage.cxx`, `csa2img.cxx`, and `iU22tomultisc.cxx`.

### 10.158.3.3 GetImage() [2/2]

`Image & gdcm::ImageWriter::GetImage ( )` `[inline]`, `[override]`, `[virtual]`

Reimplemented from `gdcm::PixmapWriter`.

### 10.158.3.4 Write()

`bool gdcm::ImageWriter::Write ( )` `[override]`, `[virtual]`

Write.

Reimplemented from `gdcm::Writer`.

#### Examples

`BasicImageAnonymizer.cs`, `CompressImage.cxx`, `CompressLossyJPEG.cs`, `CreateARGBImage.cxx`, `CreateCMYKImage.cxx`, `DecompressImage.cs`, `GenFakeImage.cxx`, `GetSubSequenceData.cxx`, `HelloVizWorld.cxx`, `MergeTwoFiles.cxx`, `MpegVideoInfo.cs`, `TemplateEmptyImage.cxx`, `csa2img.cxx`, and `iU22tomultisc.cxx`.

The documentation for this class was generated from the following file:

- `gdcmImageWriter.h`



## 10.159 gdcm::network::ImplementationClassUIDSub Class Reference

[ImplementationClassUIDSub.](#)

```
#include <gdcmImplementationClassUIDSub.h>
```

### Public Member Functions

- [ImplementationClassUIDSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.159.1 Detailed Description

[ImplementationClassUIDSub.](#)

PS 3.7 [Table D.3-1](#) IMPLEMENTATION CLASS UID SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 10.159.2 Constructor & Destructor Documentation

#### 10.159.2.1 ImplementationClassUIDSub()

```
gdcm::network::ImplementationClassUIDSub::ImplementationClassUIDSub ( )
```

### 10.159.3 Member Function Documentation

#### 10.159.3.1 Print()

```
void gdcm::network::ImplementationClassUIDSub::Print (
    std::ostream & os ) const
```

### 10.159.3.2 Read()

```
std::istream & gdcmm::network::ImplementationClassUIDSub::Read (
    std::istream & is )
```

### 10.159.3.3 Size()

```
size_t gdcmm::network::ImplementationClassUIDSub::Size ( ) const
```

### 10.159.3.4 Write()

```
const std::ostream & gdcmm::network::ImplementationClassUIDSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmmImplementationClassUIDSub.h](#)

## 10.160 gdcmm::network::ImplementationUIDSub Class Reference

[ImplementationUIDSub](#).

```
#include <gdcmmImplementationUIDSub.h>
```

### Public Member Functions

- [ImplementationUIDSub](#) ()
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.160.1 Detailed Description

[ImplementationUIDSub](#).

[Table D.3-2](#) IMPLEMENTATION UID SUB-ITEM FIELDS (A-ASSOCIATE-AC)

### 10.160.2 Constructor & Destructor Documentation

### 10.160.2.1 ImplementationUIDSub()

```
gdcm::network::ImplementationUIDSub::ImplementationUIDSub ( )
```

## 10.160.3 Member Function Documentation

### 10.160.3.1 Write()

```
const std::ostream & gdcm::network::ImplementationUIDSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmImplementationUIDSub.h](#)

## 10.161 gdcm::network::ImplementationVersionNameSub Class Reference

[ImplementationVersionNameSub.](#)

```
#include <gdcmImplementationVersionNameSub.h>
```

### Public Member Functions

- [ImplementationVersionNameSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.161.1 Detailed Description

[ImplementationVersionNameSub.](#)

[Table](#) D.3-3 IMPLEMENTATION VERSION NAME SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 10.161.2 Constructor & Destructor Documentation

### 10.161.2.1 ImplementationVersionNameSub()

```
gdcmm::network::ImplementationVersionNameSub::ImplementationVersionNameSub ( )
```

## 10.161.3 Member Function Documentation

### 10.161.3.1 Print()

```
void gdcmm::network::ImplementationVersionNameSub::Print (
    std::ostream & os ) const
```

### 10.161.3.2 Read()

```
std::istream & gdcmm::network::ImplementationVersionNameSub::Read (
    std::istream & is )
```

### 10.161.3.3 Size()

```
size_t gdcmm::network::ImplementationVersionNameSub::Size ( ) const
```

### 10.161.3.4 Write()

```
const std::ostream & gdcmm::network::ImplementationVersionNameSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmmImplementationVersionNameSub.h](#)

## 10.162 gdcmm::ImplicitDataElement Class Reference

Class to represent an *Implicit VR Data Element*.

```
#include <gdcmmImplicitDataElement.h>
```

Inheritance diagram for gdcmm::ImplicitDataElement:

Collaboration diagram for gdcmm::ImplicitDataElement:

## Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadValueWithLength](#) (std::istream &is, [VL](#) &length, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length, bool readvalues=true)
- template<typename TSwap >  
const std::ostream & [Write](#) (std::ostream &os) const

## Additional Inherited Members

### 10.162.1 Detailed Description

Class to represent an *Implicit VR* Data Element.

#### Note

bla

#### Examples

[ReadExplicitLengthSQIVR.cxx](#).

### 10.162.2 Member Function Documentation

#### 10.162.2.1 GetLength()

```
VL gdcm::ImplicitDataElement::GetLength ( ) const
```

#### 10.162.2.2 Read()

```
template<typename TSwap >
std::istream & gdcm::ImplicitDataElement::Read (
    std::istream & is )
```

### 10.162.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream & gdcm::ImplicitDataElement::ReadPreValue (
    std::istream & is )
```

### 10.162.2.4 ReadValue()

```
template<typename TSwap >
std::istream & gdcm::ImplicitDataElement::ReadValue (
    std::istream & is,
    bool readvalues = true )
```

### 10.162.2.5 ReadValueWithLength()

```
template<typename TSwap >
std::istream & gdcm::ImplicitDataElement::ReadValueWithLength (
    std::istream & is,
    VL & length,
    bool readvalues = true )
```

### 10.162.2.6 ReadWithLength()

```
template<typename TSwap >
std::istream & gdcm::ImplicitDataElement::ReadWithLength (
    std::istream & is,
    VL & length,
    bool readvalues = true )
```

### 10.162.2.7 Write()

```
template<typename TSwap >
const std::ostream & gdcm::ImplicitDataElement::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmImplicitDataElement.h](#)

## 10.163 gdcm::InitializeEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::InitializeEvent:

Collaboration diagram for gdcm::InitializeEvent:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.164 gdcm::IOD Class Reference

Class for representing a [IOD](#).

```
#include <gdcmIOD.h>
```

### Public Types

- typedef std::vector< [IODEntry](#) > [MapIODEntry](#)
- typedef MapIODEntry::size\_type [SizeType](#)

### Public Member Functions

- [IOD](#) ()=default
- void [AddIODEntry](#) (const [IODEntry](#) &iode)
- void [Clear](#) ()
- const [IODEntry](#) & [GetIODEntry](#) ([SizeType](#) idx) const
- [SizeType](#) [GetNumberOfIODs](#) () const
- [Type](#) [GetTypeFromTag](#) (const [Defs](#) &defs, const [Tag](#) &tag) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [IOD](#) &\_val)

### 10.164.1 Detailed Description

Class for representing a [IOD](#).

#### Note

bla

#### See also

[Dict](#)

#### Examples

[TraverseModules.cxx](#).

### 10.164.2 Member Typedef Documentation

#### 10.164.2.1 MapIODEntry

```
typedef std::vector<IODEntry> gdcm::IOD::MapIODEntry
```

#### 10.164.2.2 SizeType

```
typedef MapIODEntry::size_type gdcm::IOD::SizeType
```

### 10.164.3 Constructor & Destructor Documentation

#### 10.164.3.1 IOD()

```
gdcm::IOD::IOD ( ) [default]
```

### 10.164.4 Member Function Documentation



#### 10.164.4.1 AddIODEntry()

```
void gdcm::IOD::AddIODEntry (
    const IODEntry & iode ) [inline]
```

#### 10.164.4.2 Clear()

```
void gdcm::IOD::Clear ( ) [inline]
```

#### 10.164.4.3 GetIODEntry()

```
const IODEntry & gdcm::IOD::GetIODEntry (
    SizeType idx ) const [inline]
```

##### Examples

[TraverseModules.cxx](#).

#### 10.164.4.4 GetNumberOfIODs()

```
SizeType gdcm::IOD::GetNumberOfIODs ( ) const [inline]
```

##### Examples

[TraverseModules.cxx](#).

#### 10.164.4.5 GetTypeFromTag()

```
Type gdcm::IOD::GetTypeFromTag (
    const Defs & defs,
    const Tag & tag ) const
```

### 10.164.5 Friends And Related Function Documentation

### 10.164.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const IOD & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmIOD.h](#)

## 10.165 gdcm::IODEntry Class Reference

Class for representing a [IODEntry](#).

```
#include <gdcmIODEntry.h>
```

### Public Member Functions

- [IODEntry](#) (const char \*name="", const char \*ref="", const char \*usag="")
- const char \* [GetIE](#) () const
- const char \* [GetName](#) () const
- const char \* [GetRef](#) () const
- const char \* [GetUsage](#) () const
- [Usage::UsageType](#) [GetUsageType](#) () const
- void [SetIE](#) (const char \*ie)
- void [SetName](#) (const char \*name)
- void [SetRef](#) (const char \*ref)
- void [SetUsage](#) (const char \*usag)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODEntry](#) &\_val)

### 10.165.1 Detailed Description

Class for representing a [IODEntry](#).

## Note

A.1.3 [IOD Module Table](#) and Functional Group [Macro Table](#) This Section of each [IOD](#) defines in a tabular form the [Modules](#) comprising the [IOD](#). The following information must be specified for each [Module](#) in the table:

- The name of the [Module](#) or Functional Group
  - A reference to the Section in Annex C which defines the [Module](#) or Functional Group
  - The usage of the [Module](#) or Functional Group; whether it is:
    - Mandatory (see A.1.3.1) , abbreviated M
    - Conditional (see A.1.3.2) , abbreviated C
    - User Option (see A.1.3.3) , abbreviated U
- The [Modules](#) referenced are defined in Annex C. A.1.3.1 MANDATORY MODULES For each [IOD](#), Mandatory [Modules](#) shall be supported per the definitions, semantics and requirements defined in Annex C. PS 3.3 - 2008 Page 96
- A.1.3.2 CONDITIONAL MODULES Conditional [Modules](#) are Mandatory [Modules](#) if specific conditions are met. If the specified conditions are not met, this [Module](#) shall not be supported; that is, no information defined in that [Module](#) shall be sent. A.1.3.3 USER OPTION MODULES User Option [Modules](#) may or may not be supported. If an optional [Module](#) is supported, the [Attribute](#) Types specified in the [Modules](#) in Annex C shall be supported.

## See also

[DictEntry](#)

## Examples

[TraverseModules.cxx](#).

## 10.165.2 Constructor & Destructor Documentation

### 10.165.2.1 IODEntry()

```
gdcm::IODEntry::IODEntry (
    const char * name = "",
    const char * ref = "",
    const char * usag = "" ) [inline]
```

## 10.165.3 Member Function Documentation

### 10.165.3.1 GetIE()

```
const char * gdcm::IODEntry::GetIE ( ) const [inline]
```

### 10.165.3.2 GetName()

```
const char * gdcm::IODEntry::GetName ( ) const [inline]
```

### 10.165.3.3 GetRef()

```
const char * gdcm::IODEntry::GetRef ( ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 10.165.3.4 GetUsage()

```
const char * gdcm::IODEntry::GetUsage ( ) const [inline]
```

### 10.165.3.5 GetUsageType()

```
Usage::UsageType gdcm::IODEntry::GetUsageType ( ) const
```

### 10.165.3.6 SetIE()

```
void gdcm::IODEntry::SetIE (
    const char * ie ) [inline]
```

### 10.165.3.7 SetName()

```
void gdcm::IODEntry::SetName (
    const char * name ) [inline]
```

### 10.165.3.8 SetRef()

```
void gdcm::IODEntry::SetRef (
    const char * ref ) [inline]
```

### 10.165.3.9 SetUsage()

```
void gdcm::IODEntry::SetUsage (
    const char * usag ) [inline]
```

## 10.165.4 Friends And Related Function Documentation

### 10.165.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const IODEntry & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmIODEntry.h](#)

## 10.166 gdcm::IODs Class Reference

Class for representing a [IODs](#).

```
#include <gdcmIODs.h>
```

### Public Types

- typedef std::map< [IODName](#), [IOD](#) > [IODMapType](#)
- typedef IODMapType::const\_iterator [IODMapTypeConstIterator](#)
- typedef std::string [IODName](#)

## Public Member Functions

- [IODs](#) ()=default
- void [AddIOD](#) (const char \*name, const [IOD](#) &module)
- [IODMapTypeConstIterator Begin](#) () const
- void [Clear](#) ()
- [IODMapTypeConstIterator End](#) () const
- const [IOD](#) & [GetIOD](#) (const char \*name) const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [IODs](#) &\_val)

### 10.166.1 Detailed Description

Class for representing a [IODs](#).

#### Note

bla

#### See also

[IOD](#)

#### Examples

[TraverseModules.cxx](#).

### 10.166.2 Member Typedef Documentation

#### 10.166.2.1 IODMapType

```
typedef std::map<IODName, IOD> gdcm::IODs::IODMapType
```

#### 10.166.2.2 IODMapTypeConstIterator

```
typedef IODMapType::const\_iterator gdcm::IODs::IODMapTypeConstIterator
```

### 10.166.2.3 IODName

```
typedef std::string gdcm::IODs::IODName
```

## 10.166.3 Constructor & Destructor Documentation

### 10.166.3.1 IODs()

```
gdcm::IODs::IODs ( ) [default]
```

## 10.166.4 Member Function Documentation

### 10.166.4.1 AddIOD()

```
void gdcm::IODs::AddIOD (
    const char * name,
    const IOD & module ) [inline]
```

### 10.166.4.2 Begin()

```
IODMapTypeConstIterator gdcm::IODs::Begin ( ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 10.166.4.3 Clear()

```
void gdcm::IODs::Clear ( ) [inline]
```

#### 10.166.4.4 End()

```
IODMapTypeConstIterator gdcmm::IODs::End ( ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

#### 10.166.4.5 GetIOD()

```
const IOD & gdcmm::IODs::GetIOD (
    const char * name ) const [inline]
```

### 10.166.5 Friends And Related Function Documentation

#### 10.166.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const IODs & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmIODs.h](#)

## 10.167 gdcmm::IPPSorter Class Reference

[IPPSorter](#).

```
#include <gdcmmIPPSorter.h>
```

Inheritance diagram for gdcmm::IPPSorter:

Collaboration diagram for gdcmm::IPPSorter:



## Public Member Functions

- [IPPSorter](#) ()
- double [GetDirectionCosinesTolerance](#) () const
- double [GetZSpacing](#) () const
- double [GetZSpacingTolerance](#) () const
- void [SetComputeZSpacing](#) (bool b)
- void [SetDirectionCosinesTolerance](#) (double tol)
- void [SetDropDuplicatePositions](#) (bool b)
- void [SetZSpacingTolerance](#) (double tol)
- bool [Sort](#) (std::vector< std::string > const &filenames) override

## Protected Attributes

- bool [ComputeZSpacing](#)
- double [DirCosTolerance](#)
- bool [DropDuplicatePositions](#)
- double [ZSpacing](#)
- double [ZTolerance](#)

## Additional Inherited Members

### 10.167.1 Detailed Description

[IPPSorter](#).

Implement a simple [Image](#) Position ([Patient](#)) sorter, along the [Image Orientation](#) ([Patient](#)) direction. This algorithm does NOT support duplicate and will FAIL in case of duplicate IPP.

#### Warning

See special note for [SetZSpacingTolerance](#) when computing the ZSpacing from the IPP of each DICOM files (default tolerance for consistent spacing is: 1e-6mm)

For more information on [Spacing](#), and how it is defined in DICOM, advanced users may refers to:

[http://gdcm.sourceforge.net/wiki/index.php/Imager\\_Pixel\\_Spacing](http://gdcm.sourceforge.net/wiki/index.php/Imager_Pixel_Spacing)

**Bug** There are currently a couple of bugs in this implementation:

- Gantry Tilt is not considered (always an error)
- Application programmer should only sort valid [DataSet](#) (eg. [MRImageStorage](#), [CTImageStorage](#), [PETImageStorage](#))

#### Examples

[Compute3DSpacing.cxx](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

## 10.167.2 Constructor & Destructor Documentation

### 10.167.2.1 IPPSorter()

```
gdcm::IPPSorter::IPPSorter ( )
```

## 10.167.3 Member Function Documentation

### 10.167.3.1 GetDirectionCosinesTolerance()

```
double gdcm::IPPSorter::GetDirectionCosinesTolerance ( ) const [inline]
```

### 10.167.3.2 GetZSpacing()

```
double gdcm::IPPSorter::GetZSpacing ( ) const [inline]
```

Read-only function to provide access to the computed value for the Z-Spacing The ComputeZSpacing must have been set to true before execution of sort algorithm. Call this function *after* calling [Sort\(\)](#); Z-Spacing will be 0 on 2 occasions:

- Sorting simply failed, potentially duplicate IPP => ZSpacing = 0
- ZSpacing could not be computed (Z-Spacing is not constant, or ZTolerance is too low)

#### Examples

[Compute3DSpacing.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

### 10.167.3.3 GetZSpacingTolerance()

```
double gdcm::IPPSorter::GetZSpacingTolerance ( ) const [inline]
```

### 10.167.3.4 SetComputeZSpacing()

```
void gdcm::IPPSorter::SetComputeZSpacing (
    bool b ) [inline]
```

Functions related to Z-Spacing computation Set to true when sort algorithm should also perform a regular Z-Spacing computation using the [Image](#) Position ([Patient](#)) Potential reason for failure:

1. ALL slices are taken into account, if one slice is missing then ZSpacing will be set to 0 since the spacing will not be found to be regular along the [Series](#)

#### Examples

[Compute3DSpacing.cxx](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

### 10.167.3.5 SetDirectionCosinesTolerance()

```
void gdcm::IPPSorter::SetDirectionCosinesTolerance (
    double tol ) [inline]
```

Sometimes IOP along a series is slightly changing for example: "0.999081\\0.0426953\\0.00369272\\-0.0419025\\0.↵955059\\0.293439", "0.999081\\0.0426953\\0.00369275\\-0.0419025\\0.955059\\0.293439", "0.999081\\0.0426952\\0.↵00369272\\-0.0419025\\0.955059\\0.293439", We need an API to define the tolerance which is allowed. Internally the cross vector of each direction cosines is computed. The tolerance then define the distance in between 1.0 to the dot product of those cross vectors. In a perfect world this dot product is of course 1.0 which imply a [DirectionCosines](#) tolerance of exactly 0.0 (default).

### 10.167.3.6 SetDropDuplicatePositions()

```
void gdcm::IPPSorter::SetDropDuplicatePositions (
    bool b ) [inline]
```

Makes the [IPPSorter](#) ignore multiple images located at the same position. Only the first occurrence will be kept. Drop↵DuplicatePositions defaults to false.

### 10.167.3.7 SetZSpacingTolerance()

```
void gdcm::IPPSorter::SetZSpacingTolerance (
    double tol ) [inline]
```

1. Another reason for failure is that that Z-Spacing is only slightly changing (eg 1e-3) along the series, a human can determine that this is ok and change the tolerance from its default value: 1e-6

#### Examples

[Compute3DSpacing.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

### 10.167.3.8 Sort()

```
bool gdcm::IPPSorter::Sort (
    std::vector< std::string > const & filenames ) [override], [virtual]
```

Main entry point to the sorter. It will execute the filter, option should be set before running this function (SetZSpacing, Tolerance, ...) Return value indicate if sorting could be achieved,. Warning this does *NOT* imply that spacing is consistent, it only means the file are sorted according to IPP You should check if ZSpacing is 0 or not to deduce if file are actually a 3D volume

Reimplemented from [gdcm::Sorter](#).

#### Examples

[Compute3DSpacing.cxx](#), [VolumeSorter.cxx](#), [gdcmorthoplanes.cxx](#), and [reslicesphere.cxx](#).

## 10.167.4 Member Data Documentation

### 10.167.4.1 ComputeZSpacing

```
bool gdcm::IPPSorter::ComputeZSpacing [protected]
```

### 10.167.4.2 DirCosTolerance

```
double gdcm::IPPSorter::DirCosTolerance [protected]
```

### 10.167.4.3 DropDuplicatePositions

```
bool gdcm::IPPSorter::DropDuplicatePositions [protected]
```

### 10.167.4.4 ZSpacing

```
double gdcm::IPPSorter::ZSpacing [protected]
```

#### 10.167.4.5 ZTolerance

```
double gdcm::IPPSorter::ZTolerance [protected]
```

The documentation for this class was generated from the following file:

- [gdcmIPPSorter.h](#)

## 10.168 gdcm::Item Class Reference

Class to represent an [Item](#).

```
#include <gdcmItem.h>
```

Inheritance diagram for gdcm::Item:

Collaboration diagram for gdcm::Item:

### Public Member Functions

- [Item](#) ()
- [Item](#) ([Item](#) const &val)
- void [Clear](#) ()
- bool [FindDataElement](#) (const [Tag](#) &t) const
- const [DataElement](#) & [GetDataElement](#) (const [Tag](#) &t) const
- template<typename TDE >  
  [VL GetLength](#) () const
- [DataSet](#) & [GetNestedDataSet](#) ()
- const [DataSet](#) & [GetNestedDataSet](#) () const
- void [InsertDataElement](#) (const [DataElement](#) &de)
- template<typename TDE , typename TSwap >  
  std::istream & [Read](#) (std::istream &is)
- void [SetNestedDataSet](#) (const [DataSet](#) &nested)
- template<typename TDE , typename TSwap >  
  const std::ostream & [Write](#) (std::ostream &os) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [Item](#) &val)

## Additional Inherited Members

### 10.168.1 Detailed Description

Class to represent an [Item](#).

A component of the value of a Data [Element](#) that is of [Value](#) Representation Sequence of Items. An [Item](#) contains a Data Set . See PS 3.5 7.5.1 [Item](#) Encoding Rules Each [Item](#) of a Data [Element](#) of [VR](#) SQ shall be encoded as a DICOM Standard Data [Element](#) with a specific Data [Element](#) Tag of [Value](#) (FFFE,E000). The [Item](#) Tag is followed by a 4 byte [Item](#) Length field encoded in one of the following two ways Explicit/ Implicit

#### Note

ITEM: A component of the [Value](#) of a Data [Element](#) that is of [Value](#) Representation Sequence of Items. An [Item](#) contains a Data Set.

#### Examples

[ChangeSequenceUltrasound.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [NewSequence.cs](#), [SimplePrint.cs](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

### 10.168.2 Constructor & Destructor Documentation

#### 10.168.2.1 Item() [1/2]

```
gdcm::Item::Item ( ) [inline]
```

#### 10.168.2.2 Item() [2/2]

```
gdcm::Item::Item (
    Item const & val ) [inline]
```

### 10.168.3 Member Function Documentation

### 10.168.3.1 Clear()

```
void gdcm::Item::Clear ( ) [inline]
```

Referenced by [gdcm::SequenceOfItems::Read\(\)](#).

### 10.168.3.2 FindDataElement()

```
bool gdcm::Item::FindDataElement (
    const Tag & t ) const [inline]
```

### 10.168.3.3 GetDataElement()

```
const DataElement & gdcm::Item::GetDataElement (
    const Tag & t ) const [inline]
```

### 10.168.3.4 GetLength()

```
template<typename TDE >
VL gdcm::Item::GetLength ( ) const
```

### 10.168.3.5 GetNestedDataSet() [1/2]

```
DataSet & gdcm::Item::GetNestedDataSet ( ) [inline]
```

### 10.168.3.6 GetNestedDataSet() [2/2]

```
const DataSet & gdcm::Item::GetNestedDataSet ( ) const [inline]
```

#### Examples

[ChangeSequenceUltrasound.cxx](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [NewSequence.cs](#), [SimplePrint.cs](#), [gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

Referenced by [gdcm::SequenceOfItems::Read\(\)](#).

### 10.168.3.7 InsertDataElement()

```
void gdcM::Item::InsertDataElement (
    const DataElement & de ) [inline]
```

### 10.168.3.8 Read()

```
template<typename TDE , typename TSwap >
std::istream & gdcM::Item::Read (
    std::istream & is ) [inline]
```

References [gdcM::ByteSwapFilter::ByteSwap\(\)](#), [gdcM::DataSet::Clear\(\)](#), [gdcMDebugMacro](#), [gdcMErrorMacro](#), [gdcMWarningMacro](#), [gdcM::DataSet::IsEmpty\(\)](#), and [gdcM::ByteSwapFilter::SetByteSwapTag\(\)](#).

Referenced by [gdcM::SequenceOfItems::Read\(\)](#).

### 10.168.3.9 SetNestedDataSet()

```
void gdcM::Item::SetNestedDataSet (
    const DataSet & nested ) [inline]
```

### 10.168.3.10 Write()

```
template<typename TDE , typename TSwap >
const std::ostream & gdcM::Item::Write (
    std::ostream & os ) const [inline]
```

References [gdcMWarningMacro](#), [gdcM::VL::GetLength\(\)](#), [gdcM::Tag::Write\(\)](#), and [gdcM::VL::Write\(\)](#).

## 10.168.4 Friends And Related Function Documentation

### 10.168.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Item & val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMItem.h](#)



## 10.169 gdcm::IterationEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::IterationEvent:

Collaboration diagram for gdcm::IterationEvent:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.170 gdcm::JPEG12Codec Class Reference

Class to do JPEG 12bits (lossy & lossless)

```
#include <gdcmJPEG12Codec.h>
```

Inheritance diagram for gdcm::JPEG12Codec:

Collaboration diagram for gdcm::JPEG12Codec:

### Public Member Functions

- [JPEG12Codec](#) ()
- [~JPEG12Codec](#) () override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [InternalCode](#) (const char \*input, unsigned long len, std::ostream &os) override

### Protected Member Functions

- bool [EncodeBuffer](#) (std::ostream &os, const char \*data, size\_t datalen) override
- bool [IsStateSuspension](#) () const override

### Additional Inherited Members

#### 10.170.1 Detailed Description

Class to do JPEG 12bits (lossy & lossless)

Note

internal class

## 10.170.2 Constructor & Destructor Documentation

### 10.170.2.1 JPEG12Codec()

```
gdcm::JPEG12Codec::JPEG12Codec ( )
```

### 10.170.2.2 ~JPEG12Codec()

```
gdcm::JPEG12Codec::~~JPEG12Codec ( ) [override]
```

## 10.170.3 Member Function Documentation

### 10.170.3.1 DecodeByStreams()

```
bool gdcm::JPEG12Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.170.3.2 EncodeBuffer()

```
bool gdcm::JPEG12Codec::EncodeBuffer (
    std::ostream & os,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

### 10.170.3.3 GetHeaderInfo()

```
bool gdcm::JPEG12Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.170.3.4 InternalCode()

```
bool gdcm::JPEG12Codec::InternalCode (
    const char * input,
    unsigned long len,
    std::ostream & os ) [override], [virtual]
```

Reimplemented from [gdcm::Coder](#).

### 10.170.3.5 IsStateSuspension()

```
bool gdcm::JPEG12Codec::IsStateSuspension ( ) const [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

The documentation for this class was generated from the following file:

- [gdcmJPEG12Codec.h](#)

## 10.171 gdcm::JPEG16Codec Class Reference

Class to do JPEG 16bits (lossless)

```
#include <gdcmJPEG16Codec.h>
```

Inheritance diagram for gdcm::JPEG16Codec:

Collaboration diagram for gdcm::JPEG16Codec:

### Public Member Functions

- [JPEG16Codec](#) ()
- [~JPEG16Codec](#) () override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [InternalCode](#) (const char \*input, unsigned long len, std::ostream &os) override

## Protected Member Functions

- bool [EncodeBuffer](#) (std::ostream &os, const char \*data, size\_t datalen) override
- bool [IsStateSuspension](#) () const override

## Additional Inherited Members

### 10.171.1 Detailed Description

Class to do JPEG 16bits (lossless)

#### Note

internal class

### 10.171.2 Constructor & Destructor Documentation

#### 10.171.2.1 JPEG16Codec()

```
gdcmm::JPEG16Codec::JPEG16Codec ( )
```

#### 10.171.2.2 ~JPEG16Codec()

```
gdcmm::JPEG16Codec::~~JPEG16Codec ( ) [override]
```

### 10.171.3 Member Function Documentation

#### 10.171.3.1 DecodeByStreams()

```
bool gdcmm::JPEG16Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [virtual]
```

Reimplemented from [gdcmm::ImageCodec](#).

### 10.171.3.2 EncodeBuffer()

```
bool gdcm::JPEG16Codec::EncodeBuffer (
    std::ostream & os,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

### 10.171.3.3 GetHeaderInfo()

```
bool gdcm::JPEG16Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.171.3.4 InternalCode()

```
bool gdcm::JPEG16Codec::InternalCode (
    const char * input,
    unsigned long len,
    std::ostream & os ) [override], [virtual]
```

Reimplemented from [gdcm::Coder](#).

### 10.171.3.5 IsStateSuspension()

```
bool gdcm::JPEG16Codec::IsStateSuspension ( ) const [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

The documentation for this class was generated from the following file:

- [gdcmJPEG16Codec.h](#)

## 10.172 gdcm::JPEG2000Codec Class Reference

Class to do JPEG 2000.

```
#include <gdcmJPEG2000Codec.h>
```

Inheritance diagram for gdcm::JPEG2000Codec:

Collaboration diagram for gdcm::JPEG2000Codec:

### Public Member Functions

- [JPEG2000Codec](#) ()
- [~JPEG2000Codec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- double [GetQuality](#) (unsigned int idx=0) const
- double [GetRate](#) (unsigned int idx=0) const
- void [SetMCT](#) (unsigned int mct)
- void [SetNumberOfResolutions](#) (unsigned int nres)
- void [SetNumberOfThreadsForDecompression](#) (int nThreads)
- void [SetQuality](#) (unsigned int idx, double q)
- void [SetRate](#) (unsigned int idx, double rate)
- void [SetReversible](#) (bool res)
- void [SetTileSize](#) (unsigned int tx, unsigned int ty)

### Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

## Friends

- class [Bitmap](#)
- class [ImageRegionReader](#)

## Additional Inherited Members

### 10.172.1 Detailed Description

Class to do JPEG 2000.

#### Note

the class will produce JPC (JPEG 2000 codestream), since some private implementor are using full jp2 file the decoder tolerate jp2 input this is an implementation of an [ImageCodec](#)

### 10.172.2 Constructor & Destructor Documentation

#### 10.172.2.1 JPEG2000Codec()

```
gdcm::JPEG2000Codec::JPEG2000Codec ( )
```

#### 10.172.2.2 ~JPEG2000Codec()

```
gdcm::JPEG2000Codec::~~JPEG2000Codec ( ) [override]
```

### 10.172.3 Member Function Documentation

#### 10.172.3.1 AppendFrameEncode()

```
bool gdcm::JPEG2000Codec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.2 AppendRowEncode()

```
bool gdcm::JPEG2000Codec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.3 CanCode()

```
bool gdcm::JPEG2000Codec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.4 CanDecode()

```
bool gdcm::JPEG2000Codec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.5 Clone()

```
ImageCodec * gdcm::JPEG2000Codec::Clone ( ) const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

### 10.172.3.6 Code()

```
bool gdcm::JPEG2000Codec::Code (
    DataElement const & in_,
    DataElement & out_ ) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).



### 10.172.3.7 Decode()

```
bool gdcm::JPEG2000Codec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.8 DecodeByStreams()

```
bool gdcm::JPEG2000Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.9 DecodeExtent()

```
bool gdcm::JPEG2000Codec::DecodeExtent (
    char * buffer,
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax,
    std::istream & is ) [protected]
```

### 10.172.3.10 GetHeaderInfo()

```
bool gdcm::JPEG2000Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 10.172.3.11 GetQuality()

```
double gdcM::JPEG2000Codec::GetQuality (
    unsigned int idx = 0 ) const
```

#### 10.172.3.12 GetRate()

```
double gdcM::JPEG2000Codec::GetRate (
    unsigned int idx = 0 ) const
```

#### 10.172.3.13 IsFrameEncoder()

```
bool gdcM::JPEG2000Codec::IsFrameEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

#### 10.172.3.14 IsRowEncoder()

```
bool gdcM::JPEG2000Codec::IsRowEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

#### 10.172.3.15 SetMCT()

```
void gdcM::JPEG2000Codec::SetMCT (
    unsigned int mct )
```

#### 10.172.3.16 SetNumberOfResolutions()

```
void gdcM::JPEG2000Codec::SetNumberOfResolutions (
    unsigned int nres )
```

#### 10.172.3.17 SetNumberOfThreadsForDecompression()

```
void gdcM::JPEG2000Codec::SetNumberOfThreadsForDecompression (
    int nThreads )
```

Set Number of threads

## Parameters

<i>nThreads</i>	: number of threads for decompression codec, if 0 or 1 decompression is done in current thread, if negative value is set determine how many virtual threads are available
-----------------	---

**10.172.3.18 SetQuality()**

```
void gdcm::JPEG2000Codec::SetQuality (
    unsigned int idx,
    double q )
```

**10.172.3.19 SetRate()**

```
void gdcm::JPEG2000Codec::SetRate (
    unsigned int idx,
    double rate )
```

**10.172.3.20 SetReversible()**

```
void gdcm::JPEG2000Codec::SetReversible (
    bool res )
```

**10.172.3.21 SetTileSize()**

```
void gdcm::JPEG2000Codec::SetTileSize (
    unsigned int tx,
    unsigned int ty )
```

**10.172.3.22 StartEncode()**

```
bool gdcm::JPEG2000Codec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.172.3.23 StopEncode()

```
bool gdcm::JPEG2000Codec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

## 10.172.4 Friends And Related Function Documentation

### 10.172.4.1 Bitmap

```
friend class Bitmap [friend]
```

### 10.172.4.2 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

The documentation for this class was generated from the following file:

- [gdcmJPEG2000Codec.h](#)

## 10.173 gdcm::JPEG8Codec Class Reference

Class to do JPEG 8bits (lossy & lossless)

```
#include <gdcmJPEG8Codec.h>
```

Inheritance diagram for `gdcm::JPEG8Codec`:

Collaboration diagram for `gdcm::JPEG8Codec`:

### Public Member Functions

- [JPEG8Codec](#) ()
- [~JPEG8Codec](#) () override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [InternalCode](#) (const char \*input, unsigned long len, std::ostream &os) override

## Protected Member Functions

- bool [EncodeBuffer](#) (std::ostream &os, const char \*data, size\_t datalen) override
- bool [IsStateSuspension](#) () const override

## Additional Inherited Members

### 10.173.1 Detailed Description

Class to do JPEG 8bits (lossy & lossless)

#### Note

internal class

### 10.173.2 Constructor & Destructor Documentation

#### 10.173.2.1 JPEG8Codec()

```
gdcm::JPEG8Codec::JPEG8Codec ( )
```

#### 10.173.2.2 ~JPEG8Codec()

```
gdcm::JPEG8Codec::~~JPEG8Codec ( ) [override]
```

### 10.173.3 Member Function Documentation

#### 10.173.3.1 DecodeByStreams()

```
bool gdcm::JPEG8Codec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.173.3.2 EncodeBuffer()

```
bool gdcm::JPEG8Codec::EncodeBuffer (
    std::ostream & os,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

### 10.173.3.3 GetHeaderInfo()

```
bool gdcm::JPEG8Codec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.173.3.4 InternalCode()

```
bool gdcm::JPEG8Codec::InternalCode (
    const char * input,
    unsigned long len,
    std::ostream & os ) [override], [virtual]
```

Reimplemented from [gdcm::Coder](#).

### 10.173.3.5 IsStateSuspension()

```
bool gdcm::JPEG8Codec::IsStateSuspension ( ) const [override], [protected], [virtual]
```

Reimplemented from [gdcm::JPEGCodec](#).

The documentation for this class was generated from the following file:

- [gdcmJPEG8Codec.h](#)

## 10.174 gdcm::JPEGCodec Class Reference

JPEG codec.

```
#include <gdcmJPEGCodec.h>
```

Inheritance diagram for gdcm::JPEGCodec:

Collaboration diagram for gdcm::JPEGCodec:

### Public Member Functions

- [JPEGCodec](#) ()
- [~JPEGCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Compress into JPEG.*
- void [ComputeOffsetTable](#) (bool b)  
*Compute the offset table:*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- virtual bool [EncodeBuffer](#) (std::ostream &out, const char \*inbuffer, size\_t inlen)
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [GetLossless](#) () const
- double [GetQuality](#) () const
- void [SetLossless](#) (bool l)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf) override
- void [SetQuality](#) (double q)

### Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- virtual bool [IsStateSuspension](#) () const
- bool [IsValid](#) ([PhotometricInterpretation](#) const &pi) override
- void [SetBitSample](#) (int bit)
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

## Protected Attributes

- int [BitSample](#)
- int [Quality](#)

## Friends

- class [ImageRegionReader](#)

## Additional Inherited Members

### 10.174.1 Detailed Description

JPEG codec.

Class to do JPEG (8bits, 12bits, 16bits lossy & lossless). It redispach in between the different codec implementation: [JPEG8Codec](#), [JPEG12Codec](#) & [JPEG16Codec](#) It also support inconsistency in between DICOM header and JPEG compressed stream [ImageCodec](#) implementation for the JPEG case

#### Note

Things you should know if you ever want to dive into DICOM/JPEG world (among other):

- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/625e46919f208](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/625e46919f208)
- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/75fdfccc65a62](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/75fdfccc65a62)
- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/2d525ef6a2f09](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/2d525ef6a2f09)
- [http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/6b93af410f8c9](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/6b93af410f8c9)

#### Examples

[CompressLossyJPEG.cs](#), [FileChangeTSLossy.cs](#), and [GetJPEGSamplePrecision.cxx](#).

### 10.174.2 Constructor & Destructor Documentation

#### 10.174.2.1 JPEGCodec()

```
gdcm::JPEGCodec::JPEGCodec ( )
```



### 10.174.2.2 ~JPEGCodec()

```
gdcm::JPEGCodec::~~JPEGCodec ( ) [override]
```

## 10.174.3 Member Function Documentation

### 10.174.3.1 AppendFrameEncode()

```
bool gdcm::JPEGCodec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.174.3.2 AppendRowEncode()

```
bool gdcm::JPEGCodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.174.3.3 CanCode()

```
bool gdcm::JPEGCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

#### Examples

[CompressLossyJPEG.cs](#).

#### 10.174.3.4 CanDecode()

```
bool gdcm::JPEGCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

#### 10.174.3.5 Clone()

```
ImageCodec * gdcm::JPEGCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

#### 10.174.3.6 Code()

```
bool gdcm::JPEGCodec::Code (
    DataElement const & in,
    DataElement & out ) [override], [virtual]
```

Compress into JPEG.

Reimplemented from [gdcm::Coder](#).

#### 10.174.3.7 ComputeOffsetTable()

```
void gdcm::JPEGCodec::ComputeOffsetTable (
    bool b )
```

Compute the offset table:

#### 10.174.3.8 Decode()

```
bool gdcm::JPEGCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 10.174.3.9 DecodeByStreams()

```
bool gdcm::JPEGCodec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.174.3.10 DecodeExtent()

```
bool gdcm::JPEGCodec::DecodeExtent (
    char * buffer,
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax,
    std::istream & is ) [protected]
```

### 10.174.3.11 EncodeBuffer()

```
virtual bool gdcm::JPEGCodec::EncodeBuffer (
    std::ostream & out,
    const char * inbuffer,
    size_t inlen ) [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), and [gdcm::JPEG8Codec](#).

### 10.174.3.12 GetHeaderInfo()

```
bool gdcm::JPEGCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### Examples

[GetJPEGSamplePrecision.cxx](#).

#### 10.174.3.13 GetLossless()

```
bool gdcm::JPEGCodec::GetLossless ( ) const
```

#### 10.174.3.14 GetQuality()

```
double gdcm::JPEGCodec::GetQuality ( ) const
```

#### 10.174.3.15 IsFrameEncoder()

```
bool gdcm::JPEGCodec::IsFrameEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 10.174.3.16 IsRowEncoder()

```
bool gdcm::JPEGCodec::IsRowEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 10.174.3.17 IsStateSuspension()

```
virtual bool gdcm::JPEGCodec::IsStateSuspension ( ) const [protected], [virtual]
```

Reimplemented in [gdcm::JPEG12Codec](#), [gdcm::JPEG16Codec](#), and [gdcm::JPEG8Codec](#).

#### 10.174.3.18 IsValid()

```
bool gdcm::JPEGCodec::IsValid (
    PhotometricInterpretation const & pi ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.174.3.19 SetBitSample()

```
void gdcm::JPEGCodec::SetBitSample (
    int bit ) [protected]
```

### 10.174.3.20 SetLossless()

```
void gdcm::JPEGCodec::SetLossless (
    bool l )
```

#### Examples

[CompressLossyJPEG.cs](#), and [FileChangeTSLossy.cs](#).

### 10.174.3.21 SetPixelFormat()

```
void gdcm::JPEGCodec::SetPixelFormat (
    PixelFormat const & pf ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### Examples

[GetJPEGSamplePrecision.cxx](#).

### 10.174.3.22 SetQuality()

```
void gdcm::JPEGCodec::SetQuality (
    double q )
```

#### Examples

[CompressLossyJPEG.cs](#), and [FileChangeTSLossy.cs](#).

#### 10.174.3.23 StartEncode()

```
bool gdcm::JPEGCodec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 10.174.3.24 StopEncode()

```
bool gdcm::JPEGCodec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.174.4 Friends And Related Function Documentation

#### 10.174.4.1 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

### 10.174.5 Member Data Documentation

#### 10.174.5.1 BitSample

```
int gdcm::JPEGCodec::BitSample [protected]
```

#### 10.174.5.2 Quality

```
int gdcm::JPEGCodec::Quality [protected]
```

The documentation for this class was generated from the following file:

- [gdcmJPEGCodec.h](#)

## 10.175 gdcm::JPEGLSCodec Class Reference

JPEG-LS.

```
#include <gdcmJPEGLSCodec.h>
```

Inheritance diagram for gdcm::JPEGLSCodec:

Collaboration diagram for gdcm::JPEGLSCodec:

### Public Member Functions

- [JPEGLSCodec](#) ()
- [~JPEGLSCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &in, char \*outBuffer, size\_t inBufferLength, uint32\_t inXMin, uint32\_t inXMax, uint32\_t inYMin, uint32\_t inYMax, uint32\_t inZMin, uint32\_t inZMax)
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- unsigned long [GetBufferLength](#) () const
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [GetLossless](#) () const
- void [SetBufferLength](#) (unsigned long l)
- void [SetLossless](#) (bool l)
- void [SetLossyError](#) (int error)  
*[0-3] generally*

### Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int xmin, unsigned int xmax, unsigned int ymin, unsigned int ymax, unsigned int zmin, unsigned int zmax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override

### Friends

- class [ImageRegionReader](#)

## Additional Inherited Members

### 10.175.1 Detailed Description

JPEG-LS.

#### Note

codec that implement the JPEG-LS compression this is an implementation of [ImageCodec](#) for JPEG-LS

It uses the CharLS JPEG-LS implementation <https://github.com/team-charls/charls>

### 10.175.2 Constructor & Destructor Documentation

#### 10.175.2.1 JPEGLSCodec()

```
gdcm::JPEGLSCodec::JPEGLSCodec ( )
```

#### 10.175.2.2 ~JPEGLSCodec()

```
gdcm::JPEGLSCodec::~~JPEGLSCodec ( ) [override]
```

### 10.175.3 Member Function Documentation

#### 10.175.3.1 AppendFrameEncode()

```
bool gdcm::JPEGLSCodec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).



### 10.175.3.2 AppendRowEncode()

```
bool gdcm::JPEGLSCodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.3 CanCode()

```
bool gdcm::JPEGLSCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.4 CanDecode()

```
bool gdcm::JPEGLSCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.5 Clone()

```
ImageCodec * gdcm::JPEGLSCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

### 10.175.3.6 Code()

```
bool gdcm::JPEGLSCodec::Code (
    DataElement const & in_,
    DataElement & out_ ) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 10.175.3.7 Decode() [1/2]

```
bool gdcm::JPEGLSCodec::Decode (
    DataElement const & in,
    char * outBuffer,
    size_t inBufferLength,
    uint32_t inXMin,
    uint32_t inXMax,
    uint32_t inYMin,
    uint32_t inYMax,
    uint32_t inZMin,
    uint32_t inZMax )
```

### 10.175.3.8 Decode() [2/2]

```
bool gdcm::JPEGLSCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.9 DecodeExtent()

```
bool gdcm::JPEGLSCodec::DecodeExtent (
    char * buffer,
    unsigned int xmin,
    unsigned int xmax,
    unsigned int ymin,
    unsigned int ymax,
    unsigned int zmin,
    unsigned int zmax,
    std::istream & is ) [protected]
```

### 10.175.3.10 GetBufferLength()

```
unsigned long gdcm::JPEGLSCodec::GetBufferLength ( ) const [inline]
```

### 10.175.3.11 GetHeaderInfo()

```
bool gdcm::JPEGLSCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.12 GetLossless()

```
bool gdcm::JPEGLSCodec::GetLossless ( ) const
```

### 10.175.3.13 IsFrameEncoder()

```
bool gdcm::JPEGLSCodec::IsFrameEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.14 IsRowEncoder()

```
bool gdcm::JPEGLSCodec::IsRowEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.175.3.15 SetBufferLength()

```
void gdcm::JPEGLSCodec::SetBufferLength (
    unsigned long l ) [inline]
```

### 10.175.3.16 SetLossless()

```
void gdcm::JPEGLSCodec::SetLossless (
    bool l )
```

### 10.175.3.17 SetLossyError()

```
void gdcM::JPEGLSCodec::SetLossyError (
    int error )
```

[0-3] generally

### 10.175.3.18 StartEncode()

```
bool gdcM::JPEGLSCodec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

### 10.175.3.19 StopEncode()

```
bool gdcM::JPEGLSCodec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

## 10.175.4 Friends And Related Function Documentation

### 10.175.4.1 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

The documentation for this class was generated from the following file:

- [gdcMJPEGLSCodec.h](#)

## 10.176 gdcM::JSON Class Reference

```
#include <gdcMJSON.h>
```

## Public Member Functions

- [JSON](#) ()
- [~JSON](#) ()
- bool [Code](#) ([DataSet](#) const &in, std::ostream &os)
- bool [Decode](#) (std::istream &is, [DataSet](#) &out)
- bool [GetPrettyPrint](#) () const
- void [PrettyPrintOff](#) ()
- void [PrettyPrintOn](#) ()
- void [SetPrettyPrint](#) (bool onoff)

### 10.176.1 Detailed Description

#### Examples

[QIDO-RS.cxx](#).

### 10.176.2 Constructor & Destructor Documentation

#### 10.176.2.1 JSON()

```
gdcm::JSON::JSON ( )
```

#### 10.176.2.2 ~JSON()

```
gdcm::JSON::~~JSON ( )
```

### 10.176.3 Member Function Documentation

#### 10.176.3.1 Code()

```
bool gdcm::JSON::Code (
    DataSet const & in,
    std::ostream & os )
```

#### Examples

[QIDO-RS.cxx](#).

### 10.176.3.2 Decode()

```
bool gdcM::JSON::Decode (
    std::istream & is,
    DataSet & out )
```

#### Examples

[QIDO-RS.cxx](#).

### 10.176.3.3 GetPrettyPrint()

```
bool gdcM::JSON::GetPrettyPrint ( ) const
```

### 10.176.3.4 PrettyPrintOff()

```
void gdcM::JSON::PrettyPrintOff ( )
```

### 10.176.3.5 PrettyPrintOn()

```
void gdcM::JSON::PrettyPrintOn ( )
```

#### Examples

[QIDO-RS.cxx](#).

### 10.176.3.6 SetPrettyPrint()

```
void gdcM::JSON::SetPrettyPrint (
    bool onoff )
```

The documentation for this class was generated from the following file:

- [gdcMJSON.h](#)

## 10.177 gdcm::KAKADUCodec Class Reference

[KAKADUCodec](#).

```
#include <gdcmKAKADUCodec.h>
```

Inheritance diagram for gdcm::KAKADUCodec:

Collaboration diagram for gdcm::KAKADUCodec:

### Public Member Functions

- [KAKADUCodec](#) ()
- [~KAKADUCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*

### Additional Inherited Members

#### 10.177.1 Detailed Description

[KAKADUCodec](#).

#### 10.177.2 Constructor & Destructor Documentation

##### 10.177.2.1 KAKADUCodec()

```
gdcm::KAKADUCodec::KAKADUCodec ( )
```

##### 10.177.2.2 ~KAKADUCodec()

```
gdcm::KAKADUCodec::~KAKADUCodec ( ) [override]
```

### 10.177.3 Member Function Documentation

#### 10.177.3.1 CanCode()

```
bool gdcM::KAKADUCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcM::ImageCodec](#).

#### 10.177.3.2 CanDecode()

```
bool gdcM::KAKADUCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcM::ImageCodec](#).

#### 10.177.3.3 Clone()

```
ImageCodec * gdcM::KAKADUCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcM::ImageCodec](#).

#### 10.177.3.4 Code()

```
bool gdcM::KAKADUCodec::Code (
    DataElement const & in_,
    DataElement & out_ ) [override], [virtual]
```

Code.

Reimplemented from [gdcM::Coder](#).



### 10.177.3.5 Decode()

```
bool gdcm::KAKADUCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

The documentation for this class was generated from the following file:

- [gdcmKAKADUCodec.h](#)

## 10.178 gdcm::LO Class Reference

[LO](#).

```
#include <gdcmLO.h>
```

Inheritance diagram for gdcm::LO:

Collaboration diagram for gdcm::LO:

### Public Types

- typedef [Superclass::const\\_iterator](#) const\_iterator
- typedef [Superclass::const\\_reference](#) const\_reference
- typedef [Superclass::const\\_reverse\\_iterator](#) const\_reverse\_iterator
- typedef [Superclass::difference\\_type](#) difference\_type
- typedef [Superclass::iterator](#) iterator
- typedef [Superclass::pointer](#) pointer
- typedef [Superclass::reference](#) reference
- typedef [Superclass::reverse\\_iterator](#) reverse\_iterator
- typedef [Superclass::size\\_type](#) size\_type
- typedef [String<'\', 64 >](#) Superclass
- typedef [Superclass::value\\_type](#) value\_type

### Public Member Functions

- [LO](#) ()
- [LO](#) (const [Superclass](#) &s, [size\\_type](#) pos=0, [size\\_type](#) n=npos)
- [LO](#) (const [value\\_type](#) \*s)
- [LO](#) (const [value\\_type](#) \*s, [size\\_type](#) n)
- bool [IsValid](#) () const

### 10.178.1 Detailed Description

[LO](#).

Note

TODO

### 10.178.2 Member Typedef Documentation

#### 10.178.2.1 `const_iterator`

```
typedef Superclass::const\_iterator gdc::LO::const\_iterator
```

#### 10.178.2.2 `const_reference`

```
typedef Superclass::const\_reference gdc::LO::const\_reference
```

#### 10.178.2.3 `const_reverse_iterator`

```
typedef Superclass::const\_reverse\_iterator gdc::LO::const\_reverse\_iterator
```

#### 10.178.2.4 `difference_type`

```
typedef Superclass::difference\_type gdc::LO::difference\_type
```

#### 10.178.2.5 `iterator`

```
typedef Superclass::iterator gdc::LO::iterator
```

### 10.178.2.6 pointer

```
typedef Superclass::pointer gdcm::LO::pointer
```

### 10.178.2.7 reference

```
typedef Superclass::reference gdcm::LO::reference
```

### 10.178.2.8 reverse\_iterator

```
typedef Superclass::reverse_iterator gdcm::LO::reverse_iterator
```

### 10.178.2.9 size\_type

```
typedef Superclass::size_type gdcm::LO::size_type
```

### 10.178.2.10 Superclass

```
typedef String<'\\', 64> gdcm::LO::Superclass
```

### 10.178.2.11 value\_type

```
typedef Superclass::value_type gdcm::LO::value_type
```

## 10.178.3 Constructor & Destructor Documentation

### 10.178.3.1 LO() [1/4]

```
gdcm::LO::LO ( ) [inline]
```

**10.178.3.2 LO() [2/4]**

```
gdcmm::LO::LO (
    const value\_type * s ) [inline]
```

**10.178.3.3 LO() [3/4]**

```
gdcmm::LO::LO (
    const value\_type * s,
    size\_type n ) [inline]
```

**10.178.3.4 LO() [4/4]**

```
gdcmm::LO::LO (
    const Superclass & s,
    size\_type pos = 0,
    size\_type n = npos ) [inline]
```

**10.178.4 Member Function Documentation****10.178.4.1 IsValid()**

```
bool gdcmm::LO::IsValid ( ) const [inline]
```

References [gdcmm::String< TDelimiter, TMaxLength, TPadChar >::IsValid\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmmLO.h](#)

**10.179 gdcmm::LookupTable Class Reference**

[LookupTable](#) class.

```
#include <gdcmmLookupTable.h>
```

Inheritance diagram for gdcmm::LookupTable:

Collaboration diagram for gdcmm::LookupTable:

## Public Types

- enum [LookupTableType](#) {  
[RED](#) = 0 ,  
[GREEN](#) ,  
[BLUE](#) ,  
[GRAY](#) ,  
[UNKNOWN](#) }

## Public Member Functions

- [LookupTable](#) ()
- [LookupTable](#) ([LookupTable](#) const &lut)
- [~LookupTable](#) () override
- void [Allocate](#) (unsigned short bitsample=8)  
*Allocate the LUT.*
- void [Clear](#) ()  
*Clear the LUT.*
- bool [Decode](#) (char \*outputbuffer, size\_t outlen, const char \*inputbuffer, size\_t inlen) const
- void [Decode](#) (std::istream &is, std::ostream &os) const  
*Decode the LUT.*
- bool [Decode8](#) (char \*outputbuffer, size\_t outlen, const char \*inputbuffer, size\_t inlen) const  
*Decode into RGB 8 bits space.*
- unsigned short [GetBitSample](#) () const  
*return the bit sample*
- bool [GetBufferAsRGBA](#) (unsigned char \*rgba) const  
*return the LUT as RGBA buffer*
- void [GetLUT](#) ([LookupTableType](#) type, unsigned char \*array, unsigned int &length) const
- void [GetLUTDescriptor](#) ([LookupTableType](#) type, unsigned short &length, unsigned short &subscript, unsigned short &bitsize) const
- unsigned int [GetLUTLength](#) ([LookupTableType](#) type) const
- const unsigned char \* [GetPointer](#) () const  
*return a raw pointer to the LUT*
- void [InitializeBlueLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)
- bool [Initialized](#) () const  
*return whether the LUT has been initialized*
- void [InitializeGreenLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)
- void [InitializeLUT](#) ([LookupTableType](#) type, unsigned short length, unsigned short subscript, unsigned short bitsize)  
*Generic interface:*
- void [InitializeRedLUT](#) (unsigned short length, unsigned short subscript, unsigned short bitsize)  
*RED / GREEN / BLUE specific:*
- bool [IsRGB8](#) () const  
*Return whether 16 bits LUT is in RGB 8 bits space.*
- void [Print](#) (std::ostream &) const override
- void [SetBlueLUT](#) (const unsigned char \*blue, unsigned int length)
- void [SetGreenLUT](#) (const unsigned char \*green, unsigned int length)
- virtual void [SetLUT](#) ([LookupTableType](#) type, const unsigned char \*array, unsigned int length)
- void [SetRedLUT](#) (const unsigned char \*red, unsigned int length)
- bool [WriteBufferAsRGBA](#) (const unsigned char \*rgba)  
*Write the LUT as RGBA.*

## Protected Attributes

- unsigned short [BitSample](#)
- bool [IncompleteLUT](#):1
- LookupTableInternal \* [Internal](#)

## Additional Inherited Members

### 10.179.1 Detailed Description

[LookupTable](#) class.

#### Examples

[ExtractImageRegionWithLUT.cs](#), and [PrintLUT.cxx](#).

### 10.179.2 Member Enumeration Documentation

#### 10.179.2.1 LookupTableType

```
enum gdcmm::LookupTable::LookupTableType
```

##### Enumerator

RED	
GREEN	
BLUE	
GRAY	
UNKNOWN	

### 10.179.3 Constructor & Destructor Documentation

#### 10.179.3.1 LookupTable() [1/2]

```
gdcmm::LookupTable::LookupTable ( )
```

### 10.179.3.2 ~LookupTable()

```
gdcm::LookupTable::~~LookupTable ( ) [override]
```

### 10.179.3.3 LookupTable() [2/2]

```
gdcm::LookupTable::LookupTable (
    LookupTable const & lut ) [inline]
```

## 10.179.4 Member Function Documentation

### 10.179.4.1 Allocate()

```
void gdcm::LookupTable::Allocate (
    unsigned short bitsample = 8 )
```

Allocate the LUT.

### 10.179.4.2 Clear()

```
void gdcm::LookupTable::Clear ( )
```

Clear the LUT.

### 10.179.4.3 Decode() [1/2]

```
bool gdcm::LookupTable::Decode (
    char * outputbuffer,
    size_t outlen,
    const char * inputbuffer,
    size_t inlen ) const
```

Decode the LUT outputbuffer will contains the RGB decoded PALETTE COLOR input image of size inlen the outputbuffer should be at least 3 times the size of inlen

#### 10.179.4.4 Decode() [2/2]

```
void gdcM::LookupTable::Decode (
    std::istream & is,
    std::ostream & os ) const
```

Decode the LUT.

##### Examples

[ExtractImageRegionWithLUT.cs](#).

#### 10.179.4.5 Decode8()

```
bool gdcM::LookupTable::Decode8 (
    char * outputbuffer,
    size_t outlen,
    const char * inputbuffer,
    size_t inlen ) const
```

Decode into RGB 8 bits space.

#### 10.179.4.6 GetBitSample()

```
unsigned short gdcM::LookupTable::GetBitSample ( ) const [inline]
```

return the bit sample

#### 10.179.4.7 GetBufferAsRGBA()

```
bool gdcM::LookupTable::GetBufferAsRGBA (
    unsigned char * rgba ) const
```

return the LUT as RGBA buffer



#### 10.179.4.8 GetLUT()

```
void gdcm::LookupTable::GetLUT (
    LookupTableType type,
    unsigned char * array,
    unsigned int & length ) const
```

#### 10.179.4.9 GetLUTDescriptor()

```
void gdcm::LookupTable::GetLUTDescriptor (
    LookupTableType type,
    unsigned short & length,
    unsigned short & subscript,
    unsigned short & bitsize ) const
```

#### 10.179.4.10 GetLUTLength()

```
unsigned int gdcm::LookupTable::GetLUTLength (
    LookupTableType type ) const
```

#### 10.179.4.11 GetPointer()

```
const unsigned char * gdcm::LookupTable::GetPointer ( ) const
```

return a raw pointer to the LUT

#### 10.179.4.12 InitializeBlueLUT()

```
void gdcm::LookupTable::InitializeBlueLUT (
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize )
```

#### 10.179.4.13 Initialized()

```
bool gdcm::LookupTable::Initialized ( ) const
```

return whether the LUT has been initialized

#### 10.179.4.14 InitializeGreenLUT()

```
void gdcm::LookupTable::InitializeGreenLUT (
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize )
```

#### 10.179.4.15 InitializeLUT()

```
void gdcm::LookupTable::InitializeLUT (
    LookupTableType type,
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize )
```

Generic interface:

#### 10.179.4.16 InitializeRedLUT()

```
void gdcm::LookupTable::InitializeRedLUT (
    unsigned short length,
    unsigned short subscript,
    unsigned short bitsize )
```

RED / GREEN / BLUE specific:

#### 10.179.4.17 IsRGB8()

```
bool gdcm::LookupTable::IsRGB8 ( ) const
```

Return whether 16 bits LUT is in RGB 8 bits space.

#### 10.179.4.18 Print()

```
void gdcm::LookupTable::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

Reimplemented in [gdcm::SegmentedPaletteColorLookupTable](#).

#### Examples

[PrintLUT.cxx](#).

#### 10.179.4.19 SetBlueLUT()

```
void gdcm::LookupTable::SetBlueLUT (
    const unsigned char * blue,
    unsigned int length )
```

#### 10.179.4.20 SetGreenLUT()

```
void gdcm::LookupTable::SetGreenLUT (
    const unsigned char * green,
    unsigned int length )
```

#### 10.179.4.21 SetLUT()

```
virtual void gdcm::LookupTable::SetLUT (
    LookupTableType type,
    const unsigned char * array,
    unsigned int length ) [virtual]
```

Reimplemented in [gdcm::SegmentedPaletteColorLookupTable](#).

#### 10.179.4.22 SetRedLUT()

```
void gdcm::LookupTable::SetRedLUT (
    const unsigned char * red,
    unsigned int length )
```

#### 10.179.4.23 WriteBufferAsRGBA()

```
bool gdcm::LookupTable::WriteBufferAsRGBA (
    const unsigned char * rgba )
```

Write the LUT as RGBA.

### 10.179.5 Member Data Documentation

#### 10.179.5.1 BitSample

```
unsigned short gdcm::LookupTable::BitSample [protected]
```

#### 10.179.5.2 IncompleteLUT

```
bool gdcm::LookupTable::IncompleteLUT [protected]
```

#### 10.179.5.3 Internal

```
LookupTableInternal* gdcm::LookupTable::Internal [protected]
```

The documentation for this class was generated from the following file:

- [gdcmLookupTable.h](#)

### 10.180 gdcm::Scanner2::Itstr Struct Reference

```
#include <gdcmScanner2.h>
```

#### Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

## 10.180.1 Member Function Documentation

### 10.180.1.1 operator()()

```
bool gdcm::Scanner2::ltstr::operator() (
    const char * s1,
    const char * s2 ) const [inline]
```

The documentation for this struct was generated from the following file:

- [gdcmScanner2.h](#)

## 10.181 gdcm::Scanner::ltstr Struct Reference

```
#include <gdcmScanner.h>
```

### Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

## 10.181.1 Member Function Documentation

### 10.181.1.1 operator()()

```
bool gdcm::Scanner::ltstr::operator() (
    const char * s1,
    const char * s2 ) const [inline]
```

The documentation for this struct was generated from the following file:

- [gdcmScanner.h](#)

## 10.182 gdcm::StrictScanner2::ltstr Struct Reference

```
#include <gdcmStrictScanner2.h>
```

## Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

### 10.182.1 Member Function Documentation

#### 10.182.1.1 [operator\(\)](#)()

```
bool gdcM::StrictScanner2::ltstr::operator() (
    const char * s1,
    const char * s2 ) const    [inline]
```

The documentation for this struct was generated from the following file:

- [gdcMStrictScanner2.h](#)

### 10.183 gdcM::StrictScanner::ltstr Struct Reference

```
#include <gdcMStrictScanner.h>
```

## Public Member Functions

- bool [operator\(\)](#) (const char \*s1, const char \*s2) const

### 10.183.1 Member Function Documentation

#### 10.183.1.1 [operator\(\)](#)()

```
bool gdcM::StrictScanner::ltstr::operator() (
    const char * s1,
    const char * s2 ) const    [inline]
```

The documentation for this struct was generated from the following file:

- [gdcMStrictScanner.h](#)

## 10.184 gdcmmacro::Macro Class Reference

Class for representing a [Macro](#).

```
#include <gdcmmacro.h>
```

### Public Types

- typedef std::vector< std::string > [ArrayIncludeMacrosType](#)
- typedef std::map< [Tag](#), [MacroEntry](#) > [MapModuleEntry](#)

### Public Member Functions

- [Macro](#) ()=default
- void [AddMacroEntry](#) (const [Tag](#) &tag, const [MacroEntry](#) &module)  
*Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.*
- void [Clear](#) ()
- bool [FindMacroEntry](#) (const [Tag](#) &tag) const
- const [MacroEntry](#) & [GetMacroEntry](#) (const [Tag](#) &tag) const
- const char \* [GetName](#) () const
- void [SetName](#) (const char \*name)
- bool [Verify](#) (const [DataSet](#) &ds, [Usage](#) const &usage) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macro](#) &\_val)

#### 10.184.1 Detailed Description

Class for representing a [Macro](#).

#### Note

[Attribute Macro](#): a set of Attributes that are described in a single table that is referenced by multiple [Module](#) or other tables.

#### See also

[Module](#)

#### 10.184.2 Member Typedef Documentation

#### 10.184.2.1 ArrayIncludeMacroType

```
typedef std::vector<std::string> gdcmmacro::Macro::ArrayIncludeMacroType
```

#### 10.184.2.2 MapModuleEntry

```
typedef std::map<Tag, MacroEntry> gdcmmacro::Macro::MapModuleEntry
```

### 10.184.3 Constructor & Destructor Documentation

#### 10.184.3.1 Macro()

```
gdcmmacro::Macro::Macro ( ) [default]
```

### 10.184.4 Member Function Documentation

#### 10.184.4.1 AddMacroEntry()

```
void gdcmmacro::Macro::AddMacroEntry (
    const Tag & tag,
    const MacroEntry & module ) [inline]
```

Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.

#### 10.184.4.2 Clear()

```
void gdcmmacro::Macro::Clear ( ) [inline]
```



#### 10.184.4.3 FindMacroEntry()

```
bool gdcmmacro::Macro::FindMacroEntry (
    const Tag & tag ) const
```

Find or Get a [ModuleEntry](#). [ModuleEntry](#) are either search are root-level or within nested-macro included in module.

#### 10.184.4.4 GetMacroEntry()

```
const MacroEntry & gdcmmacro::Macro::GetMacroEntry (
    const Tag & tag ) const
```

#### 10.184.4.5 GetName()

```
const char * gdcmmacro::Macro::GetName ( ) const [inline]
```

#### 10.184.4.6 SetName()

```
void gdcmmacro::Macro::SetName (
    const char * name ) [inline]
```

#### 10.184.4.7 Verify()

```
bool gdcmmacro::Macro::Verify (
    const DataSet & ds,
    Usage const & usage ) const
```

### 10.184.5 Friends And Related Function Documentation

#### 10.184.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Macro & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmacro.h](#)

## 10.185 gdcm::Macros Class Reference

Class for representing a [Modules](#).

```
#include <gdcmMacros.h>
```

### Public Types

- typedef std::map< std::string, [Macro](#) > [ModuleMapType](#)

### Public Member Functions

- [Macros](#) ()=default
- void [AddMacro](#) (const char \*ref, const [Macro](#) &module)
- void [Clear](#) ()
- const [Macro](#) & [GetMacro](#) (const char \*name) const
- bool [IsEmpty](#) () const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Macros](#) &\_val)

### 10.185.1 Detailed Description

Class for representing a [Modules](#).

#### Note

bla

#### See also

[Module](#)

#### Examples

[TraverseModules.cxx](#).

### 10.185.2 Member Typedef Documentation

### 10.185.2.1 ModuleMapType

```
typedef std::map<std::string, Macro> gdcmmacros::ModuleMapType
```

## 10.185.3 Constructor & Destructor Documentation

### 10.185.3.1 Macros()

```
gdcmmacros::Macros::Macros ( ) [default]
```

## 10.185.4 Member Function Documentation

### 10.185.4.1 AddMacro()

```
void gdcmmacros::Macros::AddMacro (
    const char * ref,
    const Macro & module ) [inline]
```

### 10.185.4.2 Clear()

```
void gdcmmacros::Macros::Clear ( ) [inline]
```

### 10.185.4.3 GetMacro()

```
const Macro & gdcmmacros::Macros::GetMacro (
    const char * name ) const [inline]
```

### 10.185.4.4 IsEmpty()

```
bool gdcmmacros::Macros::IsEmpty ( ) const [inline]
```

## 10.185.5 Friends And Related Function Documentation

### 10.185.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Macros & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmMacros.h](#)

## 10.186 gdcm::network::MaximumLengthSub Class Reference

[MaximumLengthSub](#).

```
#include <gdcmMaximumLengthSub.h>
```

### Public Member Functions

- [MaximumLengthSub](#) ()
- uint32\_t [GetMaximumLength](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetMaximumLength](#) (uint32\_t maximumlength)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.186.1 Detailed Description

[MaximumLengthSub](#).

Annex D [Table](#) D.1-1 MAXIMUM LENGTH SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

or

[Table](#) D.1-2 Maximum length sub-item fields (A-ASSOCIATE-AC)

### 10.186.2 Constructor & Destructor Documentation

### 10.186.2.1 MaximumLengthSub()

```
gdcm::network::MaximumLengthSub::MaximumLengthSub ( )
```

## 10.186.3 Member Function Documentation

### 10.186.3.1 GetMaximumLength()

```
uint32_t gdcm::network::MaximumLengthSub::GetMaximumLength ( ) const [inline]
```

### 10.186.3.2 Print()

```
void gdcm::network::MaximumLengthSub::Print (
    std::ostream & os ) const
```

### 10.186.3.3 Read()

```
std::istream & gdcm::network::MaximumLengthSub::Read (
    std::istream & is )
```

### 10.186.3.4 SetMaximumLength()

```
void gdcm::network::MaximumLengthSub::SetMaximumLength (
    uint32_t maximumlength )
```

### 10.186.3.5 Size()

```
size_t gdcm::network::MaximumLengthSub::Size ( ) const
```

### 10.186.3.6 Write()

```
const std::ostream & gdcM::network::MaximumLengthSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcMMaximumLengthSub.h](#)

## 10.187 gdcM::MD5 Class Reference

Class for [MD5](#).

```
#include <gdcMMD5.h>
```

### Static Public Member Functions

- static bool [Compute](#) (const char \*buffer, size\_t buf\_len, char digest\_str[33])
- static bool [ComputeFile](#) (const char \*filename, char digest\_str[33])

*Compute md5 from a file `filename`*

### 10.187.1 Detailed Description

Class for [MD5](#).

#### Warning

this class is able to pick from two implementations:

1. a lightweight md5 implementation (when GDCM\_BUILD\_TESTING is turned ON)
2. the one from OpenSSL (when GDCM\_USE\_SYSTEM\_OPENSSL is turned ON)

In all other cases it will return an error

### 10.187.2 Member Function Documentation

### 10.187.2.1 Compute()

```
static bool gdcm::MD5::Compute (
    const char * buffer,
    size_t buf_len,
    char digest_str[33] ) [static]
```

### 10.187.2.2 ComputeFile()

```
static bool gdcm::MD5::ComputeFile (
    const char * filename,
    char digest_str[33] ) [static]
```

Compute md5 from a file *filename*

The documentation for this class was generated from the following file:

- [gdcmMD5.h](#)

## 10.188 gdcm::MEC\_MR3 Class Reference

Class for [MEC\\_MR3](#).

```
#include <gdcmMEC_MR3.h>
```

### Static Public Member Functions

- static const [PrivateTag](#) & [GetCanonMECMR3Tag](#) ()
- static const [PrivateTag](#) & [GetPMTFInformationDataTag](#) ()
- static const [PrivateTag](#) & [GetToshibaMECMR3Tag](#) ()
- static bool [Print](#) (const char \*src, size\_t srclen)

### 10.188.1 Detailed Description

Class for [MEC\\_MR3](#).

### 10.188.2 Member Function Documentation

### 10.188.2.1 GetCanonMECMR3Tag()

```
static const PrivateTag & gdcM::MEC_MR3::GetCanonMECMR3Tag ( ) [static]
```

Return the private tag used by CANON to store the MEC\_MR3 data This is: PrivateTag(0x0029,0x90,"CANON\_MEC\_MR3");

### 10.188.2.2 GetPMTFInformationDataTag()

```
static const PrivateTag & gdcM::MEC_MR3::GetPMTFInformationDataTag ( ) [static]
```

Return the private tag used by PMTF to store the MEC\_MR3 data This is: PrivateTag(0x0029,0x90,"PMTF INFORMATION DATA");

### 10.188.2.3 GetToshibaMECMR3Tag()

```
static const PrivateTag & gdcM::MEC_MR3::GetToshibaMECMR3Tag ( ) [static]
```

Return the private tag used by TOSHIBA to store the MEC\_MR3 data This is: PrivateTag(0x0029,0x90,"TOSHIBA\_MEC\_MR3");

### 10.188.2.4 Print()

```
static bool gdcM::MEC_MR3::Print (
    const char * src,
    size_t srclen ) [static]
```

The documentation for this class was generated from the following file:

- [gdcMMEC\\_MR3.h](#)

## 10.189 gdcM::MediaStorage Class Reference

[MediaStorage](#).

```
#include <gdcMMediaStorage.h>
```



## Public Types

- enum MSType {  
MediaStorageDirectoryStorage = 0 ,  
ComputedRadiographyImageStorage ,  
DigitalXRayImageStorageForPresentation ,  
DigitalXRayImageStorageForProcessing ,  
DigitalMammographyImageStorageForPresentation ,  
DigitalMammographyImageStorageForProcessing ,  
DigitalIntraoralXrayImageStorageForPresentation ,  
DigitalIntraoralXRayImageStorageForProcessing ,  
CTImageStorage ,  
EnhancedCTImageStorage ,  
UltrasoundImageStorageRetired ,  
UltrasoundImageStorage ,  
UltrasoundMultiFrameImageStorageRetired ,  
UltrasoundMultiFrameImageStorage ,  
MRImageStorage ,  
EnhancedMRImageStorage ,  
MRSpectroscopyStorage ,  
NuclearMedicineImageStorageRetired ,  
SecondaryCaptureImageStorage ,  
MultiframeSingleBitSecondaryCaptureImageStorage ,  
MultiframeGrayscaleByteSecondaryCaptureImageStorage ,  
MultiframeGrayscaleWordSecondaryCaptureImageStorage ,  
MultiframeTrueColorSecondaryCaptureImageStorage ,  
StandaloneOverlayStorage ,  
StandaloneCurveStorage ,  
LeadECGWaveformStorage ,  
GeneralECGWaveformStorage ,  
AmbulatoryECGWaveformStorage ,  
HemodynamicWaveformStorage ,  
CardiacElectrophysiologyWaveformStorage ,  
BasicVoiceAudioWaveformStorage ,  
StandaloneModalityLUTStorage ,  
StandaloneVOILUTStorage ,  
GrayscaleSoftcopyPresentationStateStorageSOPClass ,  
XRayAngiographicImageStorage ,  
XRayRadiofluoroscopicImageStorage ,  
XRayAngiographicBiPlaneImageStorageRetired ,  
NuclearMedicineImageStorage ,  
RawDataStorage ,  
SpatialRegistrationStorage ,  
SpatialFiducialsStorage ,  
PETImageStorage ,  
RTImageStorage ,  
RTDoseStorage ,  
RTStructureSetStorage ,  
RTPlanStorage ,  
CSANonImageStorage ,  
Philips3D ,  
EnhancedSR ,  
BasicTextSR ,  
HardcopyGrayscaleImageStorage ,

```

ComprehensiveSR ,
DetachedStudyManagementSOPClass ,
EncapsulatedPDFStorage ,
EncapsulatedCDASStorage ,
StudyComponentManagementSOPClass ,
DetachedVisitManagementSOPClass ,
DetachedPatientManagementSOPClass ,
VideoEndoscopicImageStorage ,
GeneralElectricMagneticResonanceImageStorage ,
GEPrivate3DModelStorage ,
ToshibaPrivateDataStorage ,
MammographyCADSR ,
KeyObjectSelectionDocument ,
HangingProtocolStorage ,
ModalityPerformedProcedureStepSOPClass ,
PhilipsPrivateMRSyntheticImageStorage ,
VLPhotographicImageStorage ,
SegmentationStorage ,
RTIonPlanStorage ,
XRay3DAngiographicImageStorage ,
EnhancedXAImageStorage ,
RTIonBeamsTreatmentRecordStorage ,
SurfaceSegmentationStorage ,
VLWholeSlideMicroscopyImageStorage ,
RTTreatmentSummaryRecordStorage ,
EnhancedUSVolumeStorage ,
XRayRadiationDoseSR ,
VLEndoscopicImageStorage ,
BreastTomosynthesisImageStorage ,
FujiPrivateCRIImageStorage ,
OphthalmicPhotography8BitImageStorage ,
OphthalmicTomographyImageStorage ,
VLMicroscopicImageStorage ,
EnhancedPETImageStorage ,
VideoPhotographicImageStorage ,
XRay3DCraniofacialImageStorage ,
IVOCTForPresentation ,
IVOCTForProcessing ,
LegacyConvertedEnhancedCTImageStorage ,
LegacyConvertedEnhancedMRIImageStorage ,
LegacyConvertedEnhancedPETImageStorage ,
BreastProjectionXRayImageStorageForPresentation ,
BreastProjectionXRayImageStorageForProcessing ,
HardcopyColorImageStorage ,
EnhancedMRColorImageStorage ,
FujiPrivateMammoCRIImageStorage ,
OphthalmicPhotography16BitImageStorage ,
VideoMicroscopicImageStorage ,
MS_END }
• enum ObjectType {
  NoObject = 0 ,
  Video ,
  Waveform ,
  Audio ,

```

PDF ,  
URI ,  
Segmentation ,  
ObjectEnd }

## Public Member Functions

- [MediaStorage](#) (MSType type=MS\_END)
- const char \* [GetModality](#) () const
- unsigned int [GetModalityDimension](#) () const
- const char \* [GetString](#) () const  
*Return the Media [String](#) of the object.*
- void [GuessFromModality](#) (const char \*modality, unsigned int dimension=2)
- bool [IsUndefined](#) () const
- [operator MSType](#) () const
- bool [SetFromDataSet](#) ([DataSet](#) const &ds)
- bool [SetFromFile](#) ([File](#) const &file)
- bool [SetFromHeader](#) ([FileMetaInformation](#) const &fmi)
- bool [SetFromModality](#) ([DataSet](#) const &ds)

## Static Public Member Functions

- static const char \* [GetMSString](#) (MSType ts)  
*Return the Media [String](#) associated. Will return NULL for MS\_END.*
- static MSType [GetMSType](#) (const char \*str)
- static unsigned int [GetNumberOfModality](#) ()
- static unsigned int [GetNumberOfMSString](#) ()
- static unsigned int [GetNumberOfMSType](#) ()
- static bool [IsImage](#) (MSType ts)

## Protected Member Functions

- void [SetFromSourceImageSequence](#) ([DataSet](#) const &ds)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [MediaStorage](#) &ms)

### 10.189.1 Detailed Description

[MediaStorage](#).

#### Note

FIXME There should not be any notion of [Image](#) and/or PDF at that point Only the codec can answer yes I support this Media Storage or not... For instance an [ImageCodec](#) will answer yes to most of them while a [PDFCodec](#) will answer only for the Encapsulated PDF

#### See also

[UIDs](#)

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenerateStandardSOPClasses.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [TestReader.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), and [iU22tomultisc.cxx](#).

### 10.189.2 Member Enumeration Documentation

#### 10.189.2.1 MSType

```
enum gdcm::MediaStorage::MSType
```

#### Enumerator

<a href="#">MediaStorageDirectoryStorage</a>	
<a href="#">ComputedRadiographyImageStorage</a>	
<a href="#">DigitalXRayImageStorageForPresentation</a>	
<a href="#">DigitalXRayImageStorageForProcessing</a>	
<a href="#">DigitalMammographyImageStorageForPresentation</a>	
<a href="#">DigitalMammographyImageStorageForProcessing</a>	
<a href="#">DigitalIntraoralXrayImageStorageForPresentation</a>	
<a href="#">DigitalIntraoralXRayImageStorageForProcessing</a>	
<a href="#">CTImageStorage</a>	
<a href="#">EnhancedCTImageStorage</a>	
<a href="#">UltrasoundImageStorageRetired</a>	
<a href="#">UltrasoundImageStorage</a>	
<a href="#">UltrasoundMultiFrameImageStorageRetired</a>	
<a href="#">UltrasoundMultiFrameImageStorage</a>	
<a href="#">MRImageStorage</a>	

## Enumerator

EnhancedMRIImageStorage	
MRSpectroscopyStorage	
NuclearMedicineImageStorageRetired	
SecondaryCaptureImageStorage	
MultiframeSingleBitSecondaryCaptureImageStorage	
MultiframeGrayscaleByteSecondaryCaptureImageStorage	
MultiframeGrayscaleWordSecondaryCaptureImageStorage	
MultiframeTrueColorSecondaryCaptureImageStorage	
StandaloneOverlayStorage	
StandaloneCurveStorage	
LeadECGWaveformStorage	
GeneralECGWaveformStorage	
AmbulatoryECGWaveformStorage	
HemodynamicWaveformStorage	
CardiacElectrophysiologyWaveformStorage	
BasicVoiceAudioWaveformStorage	
StandaloneModalityLUTStorage	
StandaloneVOILUTStorage	
GrayscaleSoftcopyPresentationStateStorageSOPClass	
XRayAngiographicImageStorage	
XRayRadiofluoroscopicImageStorage	
XRayAngiographicBiPlaneImageStorageRetired	
NuclearMedicineImageStorage	
RawDataStorage	
SpacialRegistrationStorage	
SpacialFiducialsStorage	
PETImageStorage	
RTImageStorage	
RTDoseStorage	
RTStructureSetStorage	
RTPlanStorage	
CSANonImageStorage	
Philips3D	
EnhancedSR	
BasicTextSR	
HardcopyGrayscaleImageStorage	
ComprehensiveSR	
DetachedStudyManagementSOPClass	
EncapsulatedPDFStorage	
EncapsulatedCDASStorage	
StudyComponentManagementSOPClass	
DetachedVisitManagementSOPClass	
DetachedPatientManagementSOPClass	

## Enumerator

VideoEndoscopicImageStorage	
GeneralElectricMagneticResonanceImageStorage	
GEPrivate3DModelStorage	
ToshibaPrivateDataStorage	
MammographyCADSR	
KeyObjectSelectionDocument	
HangingProtocolStorage	
ModalityPerformedProcedureStepSOPClass	
PhilipsPrivateMRSyntheticImageStorage	
VLPhotographicImageStorage	
SegmentationStorage	
RTIonPlanStorage	
XRay3DAngiographicImageStorage	
EnhancedXAImageStorage	
RTIonBeamsTreatmentRecordStorage	
SurfaceSegmentationStorage	
VLWholeSlideMicroscopyImageStorage	
RTTreatmentSummaryRecordStorage	
EnhancedUSVolumeStorage	
XRayRadiationDoseSR	
VLEndoscopicImageStorage	
BreastTomosynthesisImageStorage	
FujiPrivateCRImageStorage	
OphthalmicPhotography8BitImageStorage	
OphthalmicTomographyImageStorage	
VLMicroscopicImageStorage	
EnhancedPETImageStorage	
VideoPhotographicImageStorage	
XRay3DCraniofacialImageStorage	
IVOCTForPresentation	
IVOCTForProcessing	
LegacyConvertedEnhancedCTImageStorage	
LegacyConvertedEnhancedMRImageStorage	
LegacyConvertedEnhancedPETImageStorage	
BreastProjectionXRayImageStorageForPresentation	
BreastProjectionXRayImageStorageForProcessing	
HardcopyColorImageStorage	
EnhancedMRColorImageStorage	
FujiPrivateMammoCRImageStorage	
OphthalmicPhotography16BitImageStorage	
VideoMicroscopicImageStorage	
MS_END	

## Examples

[GenerateStandardSOPClasses.cxx](#), and [MpegVideoInfo.cs](#).

### 10.189.2.2 ObjectType

```
enum gdcm::MediaStorage::ObjectType
```

#### Enumerator

NoObject	
Video	
Waveform	
Audio	
PDF	
URI	
Segmentation	
ObjectEnd	

## 10.189.3 Constructor & Destructor Documentation

### 10.189.3.1 MediaStorage()

```
gdcm::MediaStorage::MediaStorage (
    MStype type = MS_END ) [inline]
```

## 10.189.4 Member Function Documentation

### 10.189.4.1 GetModality()

```
const char * gdcm::MediaStorage::GetModality ( ) const
```

#### 10.189.4.2 GetModalityDimension()

```
unsigned int gdcm::MediaStorage::GetModalityDimension ( ) const
```

#### 10.189.4.3 GetMSString()

```
static const char * gdcm::MediaStorage::GetMSString (
    MSType ts ) [static]
```

Return the Media [String](#) associated. Will return NULL for MS\_END.

##### Examples

[GenerateStandardSOPClasses.cxx](#).

#### 10.189.4.4 GetMSType()

```
static MSType gdcm::MediaStorage::GetMSType (
    const char * str ) [static]
```

##### Examples

[MetaImageMD5Activiz.cs](#), and [TestReader.cxx](#).

#### 10.189.4.5 GetNumberOfModality()

```
static unsigned int gdcm::MediaStorage::GetNumberOfModality ( ) [static]
```

#### 10.189.4.6 GetNumberOfMSString()

```
static unsigned int gdcm::MediaStorage::GetNumberOfMSString ( ) [static]
```



#### 10.189.4.7 GetNumberOfMSType()

```
static unsigned int gdcm::MediaStorage::GetNumberOfMSType ( ) [static]
```

#### 10.189.4.8 GetString()

```
const char * gdcm::MediaStorage::GetString ( ) const
```

Return the Media [String](#) of the object.

##### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#),  
[GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and  
[iU22tomultisc.cxx](#).

#### 10.189.4.9 GuessFromModality()

```
void gdcm::MediaStorage::GuessFromModality (
    const char * modality,
    unsigned int dimension = 2 )
```

#### 10.189.4.10 IsImage()

```
static bool gdcm::MediaStorage::IsImage (
    MSType ts ) [static]
```

Returns whether DICOM has a Pixel Data element (7fe0,0010)

##### Warning

MRSpectroscopyStorage could be image but are not

##### Examples

[MetaImageMD5Activiz.cs](#).

#### 10.189.4.11 IsUndefined()

```
bool gdcM::MediaStorage::IsUndefined ( ) const [inline]
```

##### Examples

[TestReader.cxx](#).

#### 10.189.4.12 operator MStype()

```
gdcM::MediaStorage::operator MStype ( ) const [inline]
```

#### 10.189.4.13 SetFromDataSet()

```
bool gdcM::MediaStorage::SetFromDataSet (
    DataSet const & ds )
```

Advanced user only (functions should be protected level...) Those function are lower level than SetFromFile

#### 10.189.4.14 SetFromFile()

```
bool gdcM::MediaStorage::SetFromFile (
    File const & file )
```

Attempt to set the [MediaStorage](#) from a file: WARNING: When no [MediaStorage](#) & Modality are found BUT a PixelData element is found then [MediaStorage](#) is set to the default SecondaryCaptureImageStorage (return value is false in this case)

##### Examples

[ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [TestReader.cxx](#), [gdcMrtionplan.cxx](#), and [gdcMrtplan.cxx](#).

#### 10.189.4.15 SetFromHeader()

```
bool gdcM::MediaStorage::SetFromHeader (
    FileMetaInformation const & fmi )
```

**10.189.4.16 SetFromModality()**

```
bool gdcm::MediaStorage::SetFromModality (
    DataSet const & ds )
```

**10.189.4.17 SetFromSourceImageSequence()**

```
void gdcm::MediaStorage::SetFromSourceImageSequence (
    DataSet const & ds ) [protected]
```

**10.189.5 Friends And Related Function Documentation****10.189.5.1 operator<<**

```
std::ostream & operator<< (
    std::ostream & os,
    const MediaStorage & ms ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmMediaStorage.h](#)

**10.190 gdcm::MemberCommand< T > Class Template Reference**

[Command](#) subclass that calls a pointer to a member function.

```
#include <gdcmCommand.h>
```

Inheritance diagram for gdcm::MemberCommand< T >:

Collaboration diagram for gdcm::MemberCommand< T >:

**Public Types**

- typedef [MemberCommand Self](#)
- typedef void(T::\* [TConstMemberFunctionPointer](#)) (const [Subject](#) \*, const [Event](#) &)
- typedef void(T::\* [TMemberFunctionPointer](#)) ([Subject](#) \*, const [Event](#) &)

## Public Member Functions

- [MemberCommand](#) (const [Self](#) &)=delete
- void [Execute](#) (const [Subject](#) \*caller, const [Event](#) &event) override
- void [Execute](#) ([Subject](#) \*caller, const [Event](#) &event) override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetCallbackFunction](#) (T \*object, [TConstMemberFunctionPointer](#) memberFunction)
- void [SetCallbackFunction](#) (T \*object, [TMemberFunctionPointer](#) memberFunction)

## Static Public Member Functions

- static [SmartPointer](#)< [MemberCommand](#) > [New](#) ()

## Protected Member Functions

- [MemberCommand](#) ()
- [~MemberCommand](#) () override=default

## Protected Attributes

- [TConstMemberFunctionPointer](#) m\_ConstMemberFunction
- [TMemberFunctionPointer](#) m\_MemberFunction
- T \* [m\\_This](#)

### 10.190.1 Detailed Description

```
template<class T>
class gdcmm::MemberCommand< T >
```

[Command](#) subclass that calls a pointer to a member function.

[MemberCommand](#) calls a pointer to a member function with the same arguments as [Execute](#) on [Command](#).

### 10.190.2 Member Typedef Documentation

#### 10.190.2.1 Self

```
template<class T >
typedef MemberCommand gdcmm::MemberCommand< T >::Self
```

Standard class typedefs.

### 10.190.2.2 TConstMemberFunctionPointer

```
template<class T >
typedef void(T::* gdcmmembercommand< T >::TConstMemberFunctionPointer) (const Subject *, const Event &)
```

### 10.190.2.3 TMemberFunctionPointer

```
template<class T >
typedef void(T::* gdcmmembercommand< T >::TMemberFunctionPointer) (Subject *, const Event &)
```

pointer to a member function that takes a Subject\* and the event

## 10.190.3 Constructor & Destructor Documentation

### 10.190.3.1 MemberCommand() [1/2]

```
template<class T >
gdcmmembercommand< T >::MemberCommand (
    const Self & ) [delete]
```

### 10.190.3.2 MemberCommand() [2/2]

```
template<class T >
gdcmmembercommand< T >::MemberCommand ( ) [inline], [protected]
```

Referenced by [gdcmmembercommand< T >::New\(\)](#).

### 10.190.3.3 ~MemberCommand()

```
template<class T >
gdcmmembercommand< T >::~~MemberCommand ( ) [override], [protected], [default]
```

## 10.190.4 Member Function Documentation

#### 10.190.4.1 Execute() [1/2]

```
template<class T >
void gdcM::MemberCommand< T >::Execute (
    const Subject * caller,
    const Event & event ) [inline], [override], [virtual]
```

Invoke the member function with a const object.

Implements [gdcM::Command](#).

References [gdcM::MemberCommand< T >::m\\_ConstMemberFunction](#).

#### 10.190.4.2 Execute() [2/2]

```
template<class T >
void gdcM::MemberCommand< T >::Execute (
    Subject * caller,
    const Event & event ) [inline], [override], [virtual]
```

Invoke the member function.

Implements [gdcM::Command](#).

References [gdcM::MemberCommand< T >::m\\_MemberFunction](#).

#### 10.190.4.3 New()

```
template<class T >
static SmartPointer< MemberCommand > gdcM::MemberCommand< T >::New ( ) [inline], [static]
```

Method for creation through the object factory.

References [gdcM::MemberCommand< T >::MemberCommand\(\)](#).

#### 10.190.4.4 operator=()

```
template<class T >
void gdcM::MemberCommand< T >::operator= (
    const Self & ) [delete]
```

#### 10.190.4.5 SetCallbackFunction() [1/2]

```
template<class T >
void gdcM::MemberCommand< T >::SetCallbackFunction (
    T * object,
    TConstMemberFunctionPointer memberFunction ) [inline]
```

References [gdcM::MemberCommand< T >::m\\_ConstMemberFunction](#), and [gdcM::MemberCommand< T >::m\\_This](#).

#### 10.190.4.6 SetCallbackFunction() [2/2]

```
template<class T >
void gdcM::MemberCommand< T >::SetCallbackFunction (
    T * object,
    TMemberFunctionPointer memberFunction ) [inline]
```

Run-time type information (and related methods). Set the callback function along with the object that it will be invoked on.

References [gdcM::MemberCommand< T >::m\\_MemberFunction](#), and [gdcM::MemberCommand< T >::m\\_This](#).

### 10.190.5 Member Data Documentation

#### 10.190.5.1 m\_ConstMemberFunction

```
template<class T >
TConstMemberFunctionPointer gdcM::MemberCommand< T >::m_ConstMemberFunction [protected]
```

Referenced by [gdcM::MemberCommand< T >::Execute\(\)](#), and [gdcM::MemberCommand< T >::SetCallbackFunction\(\)](#).

#### 10.190.5.2 m\_MemberFunction

```
template<class T >
TMemberFunctionPointer gdcM::MemberCommand< T >::m_MemberFunction [protected]
```

Referenced by [gdcM::MemberCommand< T >::Execute\(\)](#), and [gdcM::MemberCommand< T >::SetCallbackFunction\(\)](#).

### 10.190.5.3 m\_This

```
template<class T >
T* gdcM::MemberCommand< T >::m_This [protected]
```

Referenced by [gdcM::MemberCommand< T >::SetCallbackFunction\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMCommand.h](#)

## 10.191 gdcM::MeshPrimitive Class Reference

This class defines surface mesh primitives.

```
#include <gdcMMeshPrimitive.h>
```

Inheritance diagram for gdcM::MeshPrimitive:

Collaboration diagram for gdcM::MeshPrimitive:

### Public Types

- enum [MPTType](#) {  
[VERTEX](#) = 0 ,  
[EDGE](#) ,  
[TRIANGLE](#) ,  
[TRIANGLE\\_STRIP](#) ,  
[TRIANGLE\\_FAN](#) ,  
[LINE](#) ,  
[FACET](#) ,  
[MPTType\\_END](#) }  
*This enumeration defines primitive types.*
- typedef std::vector< [DataElement](#) > [PrimitivesData](#)

### Public Member Functions

- [MeshPrimitive](#) ()
- [~MeshPrimitive](#) () override
- void [AddPrimitiveData](#) ([DataElement](#) const &de)
- unsigned int [GetNumberOfPrimitivesData](#) () const
- [DataElement](#) & [GetPrimitiveData](#) ()
- const [DataElement](#) & [GetPrimitiveData](#) () const
- [DataElement](#) & [GetPrimitiveData](#) (const unsigned int idx)
- const [DataElement](#) & [GetPrimitiveData](#) (const unsigned int idx) const
- [PrimitivesData](#) & [GetPrimitivesData](#) ()
- const [PrimitivesData](#) & [GetPrimitivesData](#) () const
- [MPTType](#) [GetPrimitiveType](#) () const
- void [SetPrimitiveData](#) (const unsigned int idx, [DataElement](#) const &de)
- void [SetPrimitiveData](#) ([DataElement](#) const &de)
- void [SetPrimitivesData](#) ([PrimitivesData](#) const &DEs)
- void [SetPrimitiveType](#) (const [MPTType](#) type)



## Static Public Member Functions

- static [MPTYPE GetMPTYPE](#) (const char \*type)
- static const char \* [GetMPTYPEString](#) (const [MPTYPE](#) type)

## Protected Attributes

- [PrimitivesData](#) [PrimitiveData](#)
- [MPTYPE](#) [PrimitiveType](#)

## Additional Inherited Members

### 10.191.1 Detailed Description

This class defines surface mesh primitives.

It is designed from surface mesh primitives macro.

See also

PS 3.3 C.27.4

### 10.191.2 Member Typedef Documentation

#### 10.191.2.1 PrimitivesData

```
typedef std::vector< DataElement > gdcm::MeshPrimitive::PrimitivesData
```

### 10.191.3 Member Enumeration Documentation

#### 10.191.3.1 MPTYPE

```
enum gdcm::MeshPrimitive::MPTYPE
```

This enumeration defines primitive types.

See also

PS 3.3 C.27.4.1

**Enumerator**

VERTEX	
EDGE	
TRIANGLE	
TRIANGLE_STRIP	
TRIANGLE_FAN	
LINE	
FACET	
MPType_END	

**10.191.4 Constructor & Destructor Documentation****10.191.4.1 MeshPrimitive()**

```
gdcM::MeshPrimitive::MeshPrimitive ( )
```

**10.191.4.2 ~MeshPrimitive()**

```
gdcM::MeshPrimitive::~~MeshPrimitive ( ) [override]
```

**10.191.5 Member Function Documentation****10.191.5.1 AddPrimitiveData()**

```
void gdcM::MeshPrimitive::AddPrimitiveData (
    DataElement const & de )
```

**10.191.5.2 GetMPType()**

```
static MPType gdcM::MeshPrimitive::GetMPType (
    const char * type ) [static]
```

### 10.191.5.3 GetMPTypeString()

```
static const char * gdcm::MeshPrimitive::GetMPTypeString (
    const MPType type ) [static]
```

### 10.191.5.4 GetNumberOfPrimitivesData()

```
unsigned int gdcm::MeshPrimitive::GetNumberOfPrimitivesData ( ) const
```

### 10.191.5.5 GetPrimitiveData() [1/4]

```
DataElement & gdcm::MeshPrimitive::GetPrimitiveData ( )
```

### 10.191.5.6 GetPrimitiveData() [2/4]

```
const DataElement & gdcm::MeshPrimitive::GetPrimitiveData ( ) const
```

### 10.191.5.7 GetPrimitiveData() [3/4]

```
DataElement & gdcm::MeshPrimitive::GetPrimitiveData (
    const unsigned int idx )
```

### 10.191.5.8 GetPrimitiveData() [4/4]

```
const DataElement & gdcm::MeshPrimitive::GetPrimitiveData (
    const unsigned int idx ) const
```

### 10.191.5.9 GetPrimitivesData() [1/2]

```
PrimitivesData & gdcm::MeshPrimitive::GetPrimitivesData ( )
```

**10.191.5.10 GetPrimitivesData() [2/2]**

```
const PrimitivesData & gdcM::MeshPrimitive::GetPrimitivesData ( ) const
```

**10.191.5.11 GetPrimitiveType()**

```
MPType gdcM::MeshPrimitive::GetPrimitiveType ( ) const
```

**10.191.5.12 SetPrimitiveData() [1/2]**

```
void gdcM::MeshPrimitive::SetPrimitiveData (
    const unsigned int idx,
    DataElement const & de )
```

**10.191.5.13 SetPrimitiveData() [2/2]**

```
void gdcM::MeshPrimitive::SetPrimitiveData (
    DataElement const & de )
```

**10.191.5.14 SetPrimitivesData()**

```
void gdcM::MeshPrimitive::SetPrimitivesData (
    PrimitivesData const & DEs )
```

**10.191.5.15 SetPrimitiveType()**

```
void gdcM::MeshPrimitive::SetPrimitiveType (
    const MPType type )
```

**10.191.6 Member Data Documentation**

### 10.191.6.1 PrimitiveData

[PrimitiveData](#) gdcm::MeshPrimitive::PrimitiveData [protected]

### 10.191.6.2 PrimitiveType

[MPTType](#) gdcm::MeshPrimitive::PrimitiveType [protected]

The documentation for this class was generated from the following file:

- [gdcmMeshPrimitive.h](#)

## 10.192 gdcm::ModalityPerformedProcedureStepCreateQuery Class Reference

[ModalityPerformedProcedureStepCreateQuery](#).

```
#include <gdcmModalityPerformedProcedureStepCreateQuery.h>
```

Inheritance diagram for gdcm::ModalityPerformedProcedureStepCreateQuery:

Collaboration diagram for gdcm::ModalityPerformedProcedureStepCreateQuery:

### Public Member Functions

- [ModalityPerformedProcedureStepCreateQuery](#) (const std::string &iSopInstanceUID)
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [gdcm::DataSet GetRequiredDataSet](#) () const
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

#### 10.192.1 Detailed Description

[ModalityPerformedProcedureStepCreateQuery](#).

contains: the class which will produce a dataset for n-create for Modality Performed Procedure Step sop class

## 10.192.2 Constructor & Destructor Documentation

### 10.192.2.1 ModalityPerformedProcedureStepCreateQuery()

```
gdcm::ModalityPerformedProcedureStepCreateQuery::ModalityPerformedProcedureStepCreateQuery (
    const std::string & iSopInstanceUID )
```

## 10.192.3 Member Function Documentation

### 10.192.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::ModalityPerformedProcedureStepCreateQuery::GetAbstractSyntaxUID ( ) const [override],
[virtual]
```

Implements [gdcm::BaseQuery](#).

### 10.192.3.2 GetRequiredDataSet()

```
gdcm::DataSet gdcm::ModalityPerformedProcedureStepCreateQuery::GetRequiredDataSet ( ) const
```

### 10.192.3.3 ValidateQuery()

```
bool gdcm::ModalityPerformedProcedureStepCreateQuery::ValidateQuery (
    bool inStrict = true ) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

## 10.192.4 Friends And Related Function Documentation

#### 10.192.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

The documentation for this class was generated from the following file:

- [gdcmModalityPerformedProcedureStepCreateQuery.h](#)

## 10.193 gdcm::ModalityPerformedProcedureStepSetQuery Class Reference

[ModalityPerformedProcedureStepSetQuery](#).

```
#include <gdcmModalityPerformedProcedureStepSetQuery.h>
```

Inheritance diagram for gdcm::ModalityPerformedProcedureStepSetQuery:

Collaboration diagram for gdcm::ModalityPerformedProcedureStepSetQuery:

### Public Member Functions

- [ModalityPerformedProcedureStepSetQuery](#) (const std::string &iSopInstanceUID)
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [gdcm::DataSet GetRequiredDataSet](#) () const
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

#### 10.193.1 Detailed Description

[ModalityPerformedProcedureStepSetQuery](#).

contains: the class which will produce a dataset for n-set for Modality Performed Procedure Step sop class

#### 10.193.2 Constructor & Destructor Documentation

### 10.193.2.1 ModalityPerformedProcedureStepSetQuery()

```
gdcM::ModalityPerformedProcedureStepSetQuery::ModalityPerformedProcedureStepSetQuery (
    const std::string & iSopInstanceUID )
```

## 10.193.3 Member Function Documentation

### 10.193.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcM::ModalityPerformedProcedureStepSetQuery::GetAbstractSyntaxUID ( ) const [override],
[virtual]
```

Implements [gdcM::BaseQuery](#).

### 10.193.3.2 GetRequiredDataSet()

```
gdcM::DataSet gdcM::ModalityPerformedProcedureStepSetQuery::GetRequiredDataSet ( ) const
```

### 10.193.3.3 ValidateQuery()

```
bool gdcM::ModalityPerformedProcedureStepSetQuery::ValidateQuery (
    bool inStrict = true ) const [override], [virtual]
```

Implements [gdcM::BaseQuery](#).

## 10.193.4 Friends And Related Function Documentation

### 10.193.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

The documentation for this class was generated from the following file:

- [gdcMModalityPerformedProcedureStepSetQuery.h](#)



## 10.194 gdcm::ModifiedEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for gdcm::ModifiedEvent:

Collaboration diagram for gdcm::ModifiedEvent:

### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.195 gdcm::Module Class Reference

Class for representing a [Module](#).

```
#include <gdcmModule.h>
```

### Public Types

- typedef std::vector< std::string > [ArrayIncludeMacrosType](#)
- typedef std::map< [Tag](#), [ModuleEntry](#) > [MapModuleEntry](#)

### Public Member Functions

- [Module](#) ()=default
- void [AddMacro](#) (const char \*include)
- void [AddModuleEntry](#) (const [Tag](#) &tag, const [ModuleEntry](#) &module)  
*Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.*
- void [Clear](#) ()
- bool [FindModuleEntryInMacros](#) ([Macros](#) const &macros, const [Tag](#) &tag) const
- const [ModuleEntry](#) & [GetModuleEntryInMacros](#) ([Macros](#) const &macros, const [Tag](#) &tag) const
- const char \* [GetName](#) () const
- void [SetName](#) (const char \*name)
- bool [Verify](#) (const [DataSet](#) &ds, [Usage](#) const &usage) const

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Module](#) &\_val)

### 10.195.1 Detailed Description

Class for representing a [Module](#).

#### Note

[Module](#): A set of Attributes within an Information Entity or Normalized [IOD](#) which are logically related to each other.

#### See also

[Macro](#)

#### Examples

[TraverseModules.cxx](#).

### 10.195.2 Member Typedef Documentation

#### 10.195.2.1 ArrayIncludeMacroType

```
typedef std::vector<std::string> gdcm::Module::ArrayIncludeMacroType
```

#### 10.195.2.2 MapModuleEntry

```
typedef std::map<Tag, ModuleEntry> gdcm::Module::MapModuleEntry
```

### 10.195.3 Constructor & Destructor Documentation

#### 10.195.3.1 Module()

```
gdcm::Module::Module ( ) [default]
```

### 10.195.4 Member Function Documentation

#### 10.195.4.1 AddMacro()

```
void gdcmm::Module::AddMacro (
    const char * include ) [inline]
```

#### 10.195.4.2 AddModuleEntry()

```
void gdcmm::Module::AddModuleEntry (
    const Tag & tag,
    const ModuleEntry & module ) [inline]
```

Will add a [ModuleEntry](#) directly at root-level. See [Macro](#) for nested-included level.

#### 10.195.4.3 Clear()

```
void gdcmm::Module::Clear ( ) [inline]
```

#### 10.195.4.4 FindModuleEntryInMacros()

```
bool gdcmm::Module::FindModuleEntryInMacros (
    Macros const & macros,
    const Tag & tag ) const
```

Find or Get a [ModuleEntry](#). [ModuleEntry](#) are either search are root-level or within nested-macro included in module.

##### Examples

[TraverseModules.cxx](#).

#### 10.195.4.5 GetModuleEntryInMacros()

```
const ModuleEntry & gdcmm::Module::GetModuleEntryInMacros (
    Macros const & macros,
    const Tag & tag ) const
```

##### Examples

[TraverseModules.cxx](#).

#### 10.195.4.6 GetName()

```
const char * gdcmm::Module::GetName ( ) const [inline]
```

#### 10.195.4.7 SetName()

```
void gdcmm::Module::SetName (
    const char * name ) [inline]
```

#### 10.195.4.8 Verify()

```
bool gdcmm::Module::Verify (
    const DataSet & ds,
    Usage const & usage ) const
```

### 10.195.5 Friends And Related Function Documentation

#### 10.195.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Module & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmModule.h](#)

## 10.196 gdcmm::ModuleEntry Class Reference

Class for representing a [ModuleEntry](#).

```
#include <gdcmmModuleEntry.h>
```

Inheritance diagram for gdcmm::ModuleEntry:

Collaboration diagram for gdcmm::ModuleEntry:

## Public Types

- typedef std::string [Description](#)

## Public Member Functions

- [ModuleEntry](#) (const char \*name="", const char \*type="3", const char \*description="")
- virtual [~ModuleEntry](#) ()=default
- const [Description](#) & [GetDescription](#) () const
- const char \* [GetName](#) () const
- const [Type](#) & [GetType](#) () const
- void [SetDescription](#) (const char \*d)
- void [SetName](#) (const char \*name)
- void [SetType](#) (const [Type](#) &type)

## Protected Attributes

- [Type](#) [DataElementType](#)
- [Description](#) [DescriptionField](#)
- std::string [Name](#)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [ModuleEntry](#) &\_val)

### 10.196.1 Detailed Description

Class for representing a [ModuleEntry](#).

#### Note

bla

#### See also

[DictEntry](#)

#### Examples

[TraverseModules.cxx](#).

### 10.196.2 Member Typedef Documentation

### 10.196.2.1 Description

```
typedef std::string gdcM::ModuleEntry::Description
```

## 10.196.3 Constructor & Destructor Documentation

### 10.196.3.1 ModuleEntry()

```
gdcM::ModuleEntry::ModuleEntry (
    const char * name = "",
    const char * type = "3",
    const char * description = "" ) [inline]
```

References [gdcM::Type::GetTypeType\(\)](#).

### 10.196.3.2 ~ModuleEntry()

```
virtual gdcM::ModuleEntry::~~ModuleEntry ( ) [virtual], [default]
```

## 10.196.4 Member Function Documentation

### 10.196.4.1 GetDescription()

```
const Description & gdcM::ModuleEntry::GetDescription ( ) const [inline]
```

### 10.196.4.2 GetName()

```
const char * gdcM::ModuleEntry::GetName ( ) const [inline]
```

### 10.196.4.3 GetType()

```
const Type & gdcm::ModuleEntry::GetType ( ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

### 10.196.4.4 SetDescription()

```
void gdcm::ModuleEntry::SetDescription (
    const char * d ) [inline]
```

### 10.196.4.5 SetName()

```
void gdcm::ModuleEntry::SetName (
    const char * name ) [inline]
```

### 10.196.4.6 SetType()

```
void gdcm::ModuleEntry::SetType (
    const Type & type ) [inline]
```

## 10.196.5 Friends And Related Function Documentation

### 10.196.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const ModuleEntry & _val ) [friend]
```

## 10.196.6 Member Data Documentation

### 10.196.6.1 DataElementType

`Type` `gdcm::ModuleEntry::DataElementType` [protected]

### 10.196.6.2 DescriptionField

`Description` `gdcm::ModuleEntry::DescriptionField` [protected]

### 10.196.6.3 Name

`std::string` `gdcm::ModuleEntry::Name` [protected]

The documentation for this class was generated from the following file:

- [gdcmModuleEntry.h](#)

## 10.197 gdcm::Modules Class Reference

Class for representing a [Modules](#).

```
#include <gdcmModules.h>
```

### Public Types

- `typedef std::map< std::string, Module > ModuleMapType`

### Public Member Functions

- [Modules](#) ()=default
- void [AddModule](#) (const char \*ref, const [Module](#) &module)
- void [Clear](#) ()
- const [Module](#) & [GetModule](#) (const char \*name) const
- bool [IsEmpty](#) () const

### Friends

- `std::ostream & operator<< (std::ostream &_os, const Modules &_val)`



## 10.197.1 Detailed Description

Class for representing a [Modules](#).

### Note

bla

### See also

[Module](#)

### Examples

[TraverseModules.cxx](#).

## 10.197.2 Member Typedef Documentation

### 10.197.2.1 ModuleMapType

```
typedef std::map<std::string, Module> gdcmm::Modules::ModuleMapType
```

## 10.197.3 Constructor & Destructor Documentation

### 10.197.3.1 Modules()

```
gdcmm::Modules::Modules ( ) [default]
```

## 10.197.4 Member Function Documentation

### 10.197.4.1 AddModule()

```
void gdcmm::Modules::AddModule (  
    const char * ref,  
    const Module & module ) [inline]
```

#### 10.197.4.2 Clear()

```
void gdcM::Modules::Clear ( ) [inline]
```

#### 10.197.4.3 GetModule()

```
const Module & gdcM::Modules::GetModule (
    const char * name ) const [inline]
```

#### Examples

[TraverseModules.cxx](#).

#### 10.197.4.4 IsEmpty()

```
bool gdcM::Modules::IsEmpty ( ) const [inline]
```

### 10.197.5 Friends And Related Function Documentation

#### 10.197.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Modules & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMModules.h](#)

## 10.198 gdcM::MovePatientRootQuery Class Reference

[MovePatientRootQuery](#).

```
#include <gdcMMovePatientRootQuery.h>
```

Inheritance diagram for gdcM::MovePatientRootQuery:

Collaboration diagram for gdcM::MovePatientRootQuery:

## Public Member Functions

- [MovePatientRootQuery](#) ()
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- `std::vector< Tag > GetTagListByLevel` (const [EQueryLevel](#) &inQueryLevel) override
- void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- bool [ValidateQuery](#) (bool inStrict=true) const override

## Friends

- class [QueryFactory](#)

## Additional Inherited Members

### 10.198.1 Detailed Description

[MovePatientRootQuery](#).

contains: the class which will produce a dataset for c-move with patient root

### 10.198.2 Constructor & Destructor Documentation

#### 10.198.2.1 MovePatientRootQuery()

```
gdcm::MovePatientRootQuery::MovePatientRootQuery ( )
```

### 10.198.3 Member Function Documentation

#### 10.198.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::MovePatientRootQuery::GetAbstractSyntaxUID ( ) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 10.198.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::MovePatientRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 10.198.3.3 InitializeDataSet()

```
void gdcm::MovePatientRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcm4k

Implements [gdcm::BaseRootQuery](#).

### 10.198.3.4 ValidateQuery()

```
bool gdcm::MovePatientRootQuery::ValidateQuery (
    bool inStrict = true ) const [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseRootQuery](#).

## 10.198.4 Friends And Related Function Documentation

### 10.198.4.1 QueryFactory

```
friend class QueryFactory [friend]
```

The documentation for this class was generated from the following file:

- [gdcmMovePatientRootQuery.h](#)

## 10.199 gdcm::MoveStudyRootQuery Class Reference

[MoveStudyRootQuery](#).

```
#include <gdcmMoveStudyRootQuery.h>
```

Inheritance diagram for gdcm::MoveStudyRootQuery:

Collaboration diagram for gdcm::MoveStudyRootQuery:

### Public Member Functions

- [MoveStudyRootQuery](#) ()
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [std::vector< Tag > GetTagListByLevel](#) (const [EQueryLevel](#) &inQueryLevel) override
- void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

### 10.199.1 Detailed Description

[MoveStudyRootQuery](#).

contains: the class which will produce a dataset for C-MOVE with study root

### 10.199.2 Constructor & Destructor Documentation

### 10.199.2.1 MoveStudyRootQuery()

```
gdcm::MoveStudyRootQuery::MoveStudyRootQuery ( )
```

## 10.199.3 Member Function Documentation

### 10.199.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::MoveStudyRootQuery::GetAbstractSyntaxUID ( ) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 10.199.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::MoveStudyRootQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 10.199.3.3 InitializeDataSet()

```
void gdcm::MoveStudyRootQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implements [gdcm::BaseRootQuery](#).

#### 10.199.3.4 ValidateQuery()

```
bool gdcm::MoveStudyRootQuery::ValidateQuery (
    bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcm::BaseRootQuery](#).

### 10.199.4 Friends And Related Function Documentation

#### 10.199.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

- [gdcmMoveStudyRootQuery.h](#)

## 10.200 gdcm::MrProtocol Class Reference

Class for [MrProtocol](#).

```
#include <gdcmMrProtocol.h>
```

### Classes

- struct [Slice](#)
- struct [SliceArray](#)
- struct [Vector3](#)

## Public Member Functions

- [MrProtocol](#) ()
- [~MrProtocol](#) ()
- bool [FindMrProtocolByName](#) (const char \*name) const
- const char \* [GetMrProtocolByName](#) (const char \*name) const
- bool [GetSliceArray](#) ([MrProtocol::SliceArray](#) &sa) const
- int [GetVersion](#) () const
- bool [Load](#) (const [ByteValue](#) \*bv, const char \*str, int version)
- void [Print](#) (std::ostream &os) const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [MrProtocol](#) &d)

### 10.200.1 Detailed Description

Class for [MrProtocol](#).

#### Examples

[MrProtocol.cxx](#).

### 10.200.2 Constructor & Destructor Documentation

#### 10.200.2.1 MrProtocol()

```
gdcmm::MrProtocol::MrProtocol ( )
```

#### 10.200.2.2 ~MrProtocol()

```
gdcmm::MrProtocol::~~MrProtocol ( )
```

### 10.200.3 Member Function Documentation



### 10.200.3.1 FindMrProtocolByName()

```
bool gdcm::MrProtocol::FindMrProtocolByName (
    const char * name ) const
```

### 10.200.3.2 GetMrProtocolByName()

```
const char * gdcm::MrProtocol::GetMrProtocolByName (
    const char * name ) const
```

### 10.200.3.3 GetSliceArray()

```
bool gdcm::MrProtocol::GetSliceArray (
    MrProtocol::SliceArray & sa ) const
```

### 10.200.3.4 GetVersion()

```
int gdcm::MrProtocol::GetVersion ( ) const
```

### 10.200.3.5 Load()

```
bool gdcm::MrProtocol::Load (
    const ByteValue * bv,
    const char * str,
    int version )
```

### 10.200.3.6 Print()

```
void gdcm::MrProtocol::Print (
    std::ostream & os ) const
```

## 10.200.4 Friends And Related Function Documentation

#### 10.200.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const MrProtocol & d ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmMrProtocol.h](#)

## 10.201 gdcm::network::NActionRQ Class Reference

[NActionRQ](#).

```
#include <gdcmNActionMessages.h>
```

Inheritance diagram for gdcm::network::NActionRQ:

Collaboration diagram for gdcm::network::NActionRQ:

### Public Member Functions

- std::vector< [PresentationDataValue](#) > [ConstructPDV](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

#### 10.201.1 Detailed Description

[NActionRQ](#).

this file defines the messages for the NAction action

#### 10.201.2 Member Function Documentation

##### 10.201.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::NActionRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [override], [virtual]
```

Implements [gdcm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

- [gdcmNActionMessages.h](#)

## 10.202 gdcm::network::NActionRSP Class Reference

[NActionRSP](#) this file defines the messages for the NAction action.

```
#include <gdcmNActionMessages.h>
```

Inheritance diagram for gdcm::network::NActionRSP:

Collaboration diagram for gdcm::network::NActionRSP:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

#### 10.202.1 Detailed Description

[NActionRSP](#) this file defines the messages for the NAction action.

#### 10.202.2 Member Function Documentation

##### 10.202.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NActionRSP::ConstructPDVByDataSet (  
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmNActionMessages.h](#)

## 10.203 gdcm::network::NCreateRQ Class Reference

[NCreateRQ](#).

```
#include <gdcmNCreateMessages.h>
```

Inheritance diagram for gdcm::network::NCreateRQ:

Collaboration diagram for gdcm::network::NCreateRQ:

## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

### 10.203.1 Detailed Description

[NCreateRQ](#).

this file defines the messages for the ncreate action

### 10.203.2 Member Function Documentation

#### 10.203.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcmm::network::NCreateRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [override], [virtual]
```

Implements [gdcmm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

- [gdcmmNCreateMessages.h](#)

## 10.204 gdcmm::network::NCreateRSP Class Reference

[NCreateRSP](#) this file defines the messages for the ncreate action.

```
#include <gdcmmNCreateMessages.h>
```

Inheritance diagram for `gdcmm::network::NCreateRSP`:

Collaboration diagram for `gdcmm::network::NCreateRSP`:

## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### 10.204.1 Detailed Description

[NCreateRSP](#) this file defines the messages for the ncreate action.

### 10.204.2 Member Function Documentation

#### 10.204.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NCreateRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmNCreateMessages.h](#)

## 10.205 gdcm::network::NDeleteRQ Class Reference

[NDeleteRQ](#).

```
#include <gdcmNDeleteMessages.h>
```

Inheritance diagram for gdcm::network::NDeleteRQ:

Collaboration diagram for gdcm::network::NDeleteRQ:

### Public Member Functions

- std::vector< [PresentationDataValue](#) > [ConstructPDV](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

### 10.205.1 Detailed Description

[NDeleteRQ](#).

this file defines the messages for the ndelete action

### 10.205.2 Member Function Documentation

### 10.205.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::NDeleteRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [override], [virtual]
```

Implements [gdcM::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

- [gdcMNDeleteMessages.h](#)

## 10.206 gdcM::network::NDeleteRSP Class Reference

[NDeleteRSP](#) this file defines the messages for the ndelete action.

```
#include <gdcMNDeleteMessages.h>
```

Inheritance diagram for gdcM::network::NDeleteRSP:

Collaboration diagram for gdcM::network::NDeleteRSP:

### Public Member Functions

- std::vector< [PresentationDataValue](#) > [ConstructPDVByDataSet](#) (const [DataSet](#) \*inDataSet)

### 10.206.1 Detailed Description

[NDeleteRSP](#) this file defines the messages for the ndelete action.

### 10.206.2 Member Function Documentation

#### 10.206.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcM::network::NDeleteRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcMNDeleteMessages.h](#)

## 10.207 gdcm::NestedModuleEntries Class Reference

Class for representing a [NestedModuleEntries](#).

```
#include <gdcmNestedModuleEntries.h>
```

Inheritance diagram for gdcm::NestedModuleEntries:

Collaboration diagram for gdcm::NestedModuleEntries:

### Public Types

- typedef std::vector< [ModuleEntry](#) >::size\_type [SizeType](#)

### Public Member Functions

- [NestedModuleEntries](#) (const char \*name="", const char \*type="3", const char \*description="")
- void [AddModuleEntry](#) (const [ModuleEntry](#) &me)
- [ModuleEntry](#) & [GetModuleEntry](#) ([SizeType](#) idx)
- const [ModuleEntry](#) & [GetModuleEntry](#) ([SizeType](#) idx) const
- [SizeType](#) [GetNumberOfModuleEntries](#) ()

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [NestedModuleEntries](#) &\_val)

### Additional Inherited Members

#### 10.207.1 Detailed Description

Class for representing a [NestedModuleEntries](#).

Note

bla

See also

[ModuleEntry](#)

#### 10.207.2 Member Typedef Documentation

### 10.207.2.1 SizeType

```
typedef std::vector<ModuleEntry>::size_type gdcmm::NestedModuleEntries::SizeType
```

## 10.207.3 Constructor & Destructor Documentation

### 10.207.3.1 NestedModuleEntries()

```
gdcmm::NestedModuleEntries::NestedModuleEntries (
    const char * name = "",
    const char * type = "3",
    const char * description = "" ) [inline]
```

## 10.207.4 Member Function Documentation

### 10.207.4.1 AddModuleEntry()

```
void gdcmm::NestedModuleEntries::AddModuleEntry (
    const ModuleEntry & me ) [inline]
```

### 10.207.4.2 GetModuleEntry() [1/2]

```
ModuleEntry & gdcmm::NestedModuleEntries::GetModuleEntry (
    SizeType idx ) [inline]
```

### 10.207.4.3 GetModuleEntry() [2/2]

```
const ModuleEntry & gdcmm::NestedModuleEntries::GetModuleEntry (
    SizeType idx ) const [inline]
```



#### 10.207.4.4 GetNumberOfModuleEntries()

```
SizeType gdcm::NestedModuleEntries::GetNumberOfModuleEntries ( ) [inline]
```

### 10.207.5 Friends And Related Function Documentation

#### 10.207.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const NestedModuleEntries & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmNestedModuleEntries.h](#)

## 10.208 gdcm::network::NEventReportRQ Class Reference

[NEventReportRQ](#).

```
#include <gdcmNEventReportMessages.h>
```

Inheritance diagram for gdcm::network::NEventReportRQ:

Collaboration diagram for gdcm::network::NEventReportRQ:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

#### 10.208.1 Detailed Description

[NEventReportRQ](#).

this file defines the messages for the neventreport action

#### 10.208.2 Member Function Documentation

### 10.208.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::NEventReportRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [override], [virtual]
```

Implements [gdcM::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

- [gdcMNEventReportMessages.h](#)

## 10.209 gdcM::network::NEventReportRSP Class Reference

[NEventReportRSP](#) this file defines the messages for the neventreport action.

```
#include <gdcMNEventReportMessages.h>
```

Inheritance diagram for [gdcM::network::NEventReportRSP](#):

Collaboration diagram for [gdcM::network::NEventReportRSP](#):

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet (const DataSet *inDataSet)`

### 10.209.1 Detailed Description

[NEventReportRSP](#) this file defines the messages for the neventreport action.

### 10.209.2 Member Function Documentation

#### 10.209.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcM::network::NEventReportRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcMNEventReportMessages.h](#)

## 10.210 gdcm::network::NGetRQ Class Reference

[NGetRQ](#).

```
#include <gdcmNGetMessages.h>
```

Inheritance diagram for gdcm::network::NGetRQ:

Collaboration diagram for gdcm::network::NGetRQ:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

#### 10.210.1 Detailed Description

[NGetRQ](#).

this file defines the messages for the nget action

#### 10.210.2 Member Function Documentation

##### 10.210.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcm::network::NGetRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [override], [virtual]
```

Implements [gdcm::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

- [gdcmNGetMessages.h](#)

## 10.211 gdcm::network::NGetRSP Class Reference

[NGetRSP](#) this file defines the messages for the nget action.

```
#include <gdcmNGetMessages.h>
```

Inheritance diagram for gdcm::network::NGetRSP:

Collaboration diagram for gdcm::network::NGetRSP:

## Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDVByDataSet` (const [DataSet](#) \*inDataSet)

### 10.211.1 Detailed Description

[NGetRSP](#) this file defines the messages for the nget action.

### 10.211.2 Member Function Documentation

#### 10.211.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NGetRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmNGetMessages.h](#)

## 10.212 gdcm::NoEvent Class Reference

```
#include <gdcmEvent.h>
```

Inheritance diagram for `gdcm::NoEvent`:

Collaboration diagram for `gdcm::NoEvent`:

## Additional Inherited Members

### 10.212.1 Detailed Description

Define some common GDCM events

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.213 gdcm::network::NormalizedMessageFactory Class Reference

```
#include <gdcmNormalizedMessageFactory.h>
```

### Static Public Member Functions

- static std::vector< [PresentationDataValue](#) > [ConstructNAction](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNCreate](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNDelete](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNEventReport](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNGet](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)
- static std::vector< [PresentationDataValue](#) > [ConstructNSet](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)

### 10.213.1 Member Function Documentation

#### 10.213.1.1 ConstructNAction()

```
static std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNAction (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.213.1.2 ConstructNCreate()

```
static std::vector< PresentationDataValue > gdcm::network::NormalizedMessageFactory::ConstructNCreate (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

### 10.213.1.3 ConstructNDelete()

```
static std::vector< PresentationDataValue > gdcM::network::NormalizedMessageFactory::Construct↵  
NDelete (   
    const ULConnection & inConnection,   
    const BaseQuery * inQuery ) [static]
```

### 10.213.1.4 ConstructNEventReport()

```
static std::vector< PresentationDataValue > gdcM::network::NormalizedMessageFactory::Construct↵  
NEventReport (   
    const ULConnection & inConnection,   
    const BaseQuery * inQuery ) [static]
```

### 10.213.1.5 ConstructNGet()

```
static std::vector< PresentationDataValue > gdcM::network::NormalizedMessageFactory::Construct↵  
NGet (   
    const ULConnection & inConnection,   
    const BaseQuery * inQuery ) [static]
```

### 10.213.1.6 ConstructNSet()

```
static std::vector< PresentationDataValue > gdcM::network::NormalizedMessageFactory::Construct↵  
NSet (   
    const ULConnection & inConnection,   
    const BaseQuery * inQuery ) [static]
```

The documentation for this class was generated from the following file:

- [gdcMNormalizedMessageFactory.h](#)

## 10.214 gdcM::NormalizedNetworkFunctions Class Reference

Normalized Network Functions.

```
#include <gdcMNormalizedNetworkFunctions.h>
```

## Static Public Member Functions

- static [BaseQuery](#) \* [ConstructQuery](#) (const std::string &sopInstanceUID, const [DataSet](#) &queryds, [ENQueryType](#) queryType=[eCreateMMPS](#))
- static bool [NAction](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NCreate](#) (const char \*remote, uint16\_t portno, [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NDelete](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NEventReport](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NGet](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)
- static bool [NSet](#) (const char \*remote, uint16\_t portno, const [BaseQuery](#) \*query, std::vector< [DataSet](#) > &retDataSets, const char \*aetitle, const char \*call)

### 10.214.1 Detailed Description

Normalized Network Functions.

These functions provide a generic API to the DICOM functions implemented in GDCM. Advanced users can use this code as a template for building their own versions of these functions (for instance, to provide progress bars or some other way of handling returned query information), but for most users, these functions should be sufficient to interface with a PACS to a local machine. Note that these functions are not contained within a static class or some other class-style interface, because multiple connections can be instantiated in the same program. The DICOM standard is much more function oriented rather than class oriented in this instance, so the design of this API reflects that functional approach. These functions implements the following SCU operations:

- N-EVENT-REPORT
- N-GET
- N-SET
- N-ACTION
- N-CREATE
- N-DELETE

### 10.214.2 Member Function Documentation

#### 10.214.2.1 ConstructQuery()

```
static BaseQuery * gdcm::NormalizedNetworkFunctions::ConstructQuery (
    const std::string & sopInstanceUID,
    const DataSet & queryds,
    ENQueryType queryType = eCreateMMPS ) [static]
```

#### 10.214.2.2 NAction()

```
static bool gdcmm::NormalizedNetworkFunctions::NAction (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call ) [static]
```

#### 10.214.2.3 NCreate()

```
static bool gdcmm::NormalizedNetworkFunctions::NCreate (
    const char * remote,
    uint16_t portno,
    BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call ) [static]
```

#### 10.214.2.4 NDelete()

```
static bool gdcmm::NormalizedNetworkFunctions::NDelete (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call ) [static]
```

#### 10.214.2.5 NEventReport()

```
static bool gdcmm::NormalizedNetworkFunctions::NEventReport (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call ) [static]
```



### 10.214.2.6 NGet()

```
static bool gdcm::NormalizedNetworkFunctions::NGet (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call ) [static]
```

### 10.214.2.7 NSet()

```
static bool gdcm::NormalizedNetworkFunctions::NSet (
    const char * remote,
    uint16_t portno,
    const BaseQuery * query,
    std::vector< DataSet > & retDataSets,
    const char * aetitle,
    const char * call ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmNormalizedNetworkFunctions.h](#)

## 10.215 gdcm::network::NSetRQ Class Reference

[NSetRQ](#).

```
#include <gdcmNSetMessages.h>
```

Inheritance diagram for gdcm::network::NSetRQ:

Collaboration diagram for gdcm::network::NSetRQ:

### Public Member Functions

- `std::vector< PresentationDataValue > ConstructPDV` (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery) override

### 10.215.1 Detailed Description

[NSetRQ](#).

this file defines the messages for the nset action

## 10.215.2 Member Function Documentation

### 10.215.2.1 ConstructPDV()

```
std::vector< PresentationDataValue > gdcM::network::NSetRQ::ConstructPDV (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [override], [virtual]
```

Implements [gdcM::network::BaseNormalizedMessage](#).

The documentation for this class was generated from the following file:

- [gdcMNSetMessages.h](#)

## 10.216 gdcM::network::NSetRSP Class Reference

[NSetRSP](#) this file defines the messages for the nset action.

```
#include <gdcMNSetMessages.h>
```

Inheritance diagram for gdcM::network::NSetRSP:

Collaboration diagram for gdcM::network::NSetRSP:

### Public Member Functions

- std::vector< [PresentationDataValue](#) > [ConstructPDVByDataSet](#) (const [DataSet](#) \*inDataSet)

### 10.216.1 Detailed Description

[NSetRSP](#) this file defines the messages for the nset action.

### 10.216.2 Member Function Documentation

### 10.216.2.1 ConstructPDVByDataSet()

```
std::vector< PresentationDataValue > gdcm::network::NSetRSP::ConstructPDVByDataSet (
    const DataSet * inDataSet )
```

The documentation for this class was generated from the following file:

- [gdcmNSetMessages.h](#)

## 10.217 gdcm::Object Class Reference

[Object](#).

```
#include <gdcmObject.h>
```

Inheritance diagram for gdcm::Object:

### Public Member Functions

- [Object](#) ()
- [Object](#) (const [Object](#) &)
- *Special requirement for copy/cstor, assignment operator.*
- virtual [~Object](#) ()
- void [operator=](#) (const [Object](#) &)
- virtual void [Print](#) (std::ostream &) const

### Protected Member Functions

- void [Register](#) ()
- void [UnRegister](#) ()

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [Object](#) &obj)
- template<class ObjectType >  
class [SmartPointer](#)

### 10.217.1 Detailed Description

[Object](#).

#### Note

main superclass for object that want to use [SmartPointer](#) invasive ref counting system

#### See also

[SmartPointer](#)

## 10.217.2 Constructor & Destructor Documentation

### 10.217.2.1 Object() [1/2]

```
gdcm::Object::Object ( ) [inline]
```

### 10.217.2.2 ~Object()

```
virtual gdcm::Object::~~Object ( ) [inline], [virtual]
```

### 10.217.2.3 Object() [2/2]

```
gdcm::Object::Object (
    const Object & ) [inline]
```

Special requirement for copy/cstor, assignment operator.

## 10.217.3 Member Function Documentation

### 10.217.3.1 operator=()

```
void gdcm::Object::operator= (
    const Object & ) [inline]
```

### 10.217.3.2 Print()

```
virtual void gdcm::Object::Print (
    std::ostream & ) const [inline], [virtual]
```

Reimplemented in [gdcm::Bitmap](#), [gdcm::Curve](#), [gdcm::LookupTable](#), [gdcm::Overlay](#), [gdcm::Pixmap](#), [gdcm::SegmentedPaletteColorLookupTable](#), [gdcm::ByteValue](#), [gdcm::SequenceOfFragments](#), [gdcm::SequenceOfItems](#), [gdcm::Image](#), [gdcm::Scanner](#), [gdcm::Scanner2](#), [gdcm::StrictScanner](#), [gdcm::StrictScanner2](#), and [gdcm::BaseQuery](#).

#### Examples

[ReadAndDumpDICOMDIR.cxx](#).

### 10.217.3.3 Register()

```
void gdcm::Object::Register ( ) [inline], [protected]
```

### 10.217.3.4 UnRegister()

```
void gdcm::Object::UnRegister ( ) [inline], [protected]
```

## 10.217.4 Friends And Related Function Documentation

### 10.217.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Object & obj ) [friend]
```

### 10.217.4.2 SmartPointer

```
template<class ObjectType >
friend class SmartPointer [friend]
```

The documentation for this class was generated from the following file:

- [gdcmObject.h](#)

## 10.218 gdcm::OpenSSLCryptoFactory Class Reference

```
#include <gdcmOpenSSLCryptoFactory.h>
```

Inheritance diagram for gdcm::OpenSSLCryptoFactory:

Collaboration diagram for gdcm::OpenSSLCryptoFactory:

### Public Member Functions

- [OpenSSLCryptoFactory](#) ([CryptoLib](#) id)
- [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()

## Protected Member Functions

- void [InitOpenSSL](#) ()

## Additional Inherited Members

### 10.218.1 Constructor & Destructor Documentation

#### 10.218.1.1 OpenSSLCryptoFactory()

```
gdcM::OpenSSLCryptoFactory::OpenSSLCryptoFactory (
    CryptoLib id ) [inline]
```

References [gdcMDebugMacro](#).

### 10.218.2 Member Function Documentation

#### 10.218.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax * gdcM::OpenSSLCryptoFactory::CreateCMSProvider ( ) [inline], [virtual]
```

Implements [gdcM::CryptoFactory](#).

#### 10.218.2.2 InitOpenSSL()

```
void gdcM::OpenSSLCryptoFactory::InitOpenSSL ( ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcMOpenSSLCryptoFactory.h](#)

## 10.219 gdcM::OpenSSLCryptographicMessageSyntax Class Reference

```
#include <gdcMOpenSSLCryptographicMessageSyntax.h>
```

Inheritance diagram for gdcM::OpenSSLCryptographicMessageSyntax:

Collaboration diagram for gdcM::OpenSSLCryptographicMessageSyntax:

## Public Member Functions

- [OpenSSLCryptographicMessageSyntax](#) ()
- [~OpenSSLCryptographicMessageSyntax](#) ()
- bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*decrypt content from a PKCS#7 envelopedData structure*
- bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*create a CMS envelopedData structure*
- [CipherTypes](#) [GetCipherType](#) () const
- bool [ParseCertificateFile](#) (const char \*filename)
- bool [ParseKeyFile](#) (const char \*filename)
- void [SetCipherType](#) ([CipherTypes](#) type)
- bool [SetPassword](#) (const char \*pass, size\_t passLen)

## Additional Inherited Members

### 10.219.1 Constructor & Destructor Documentation

#### 10.219.1.1 OpenSSLCryptographicMessageSyntax()

```
gdcmm::OpenSSLCryptographicMessageSyntax::OpenSSLCryptographicMessageSyntax ( )
```

#### 10.219.1.2 ~OpenSSLCryptographicMessageSyntax()

```
gdcmm::OpenSSLCryptographicMessageSyntax::~~OpenSSLCryptographicMessageSyntax ( )
```

### 10.219.2 Member Function Documentation

#### 10.219.2.1 Decrypt()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::Decrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [virtual]
```

decrypt content from a PKCS#7 envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.219.2.2 Encrypt()

```
bool gdcM::OpenSSLCryptographicMessageSyntax::Encrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [virtual]
```

create a CMS envelopedData structure

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.219.2.3 GetCipherType()

```
CipherTypes gdcM::OpenSSLCryptographicMessageSyntax::GetCipherType ( ) const [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.219.2.4 ParseCertificateFile()

```
bool gdcM::OpenSSLCryptographicMessageSyntax::ParseCertificateFile (
    const char * filename ) [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.219.2.5 ParseKeyFile()

```
bool gdcM::OpenSSLCryptographicMessageSyntax::ParseKeyFile (
    const char * filename ) [virtual]
```

Implements [gdcM::CryptographicMessageSyntax](#).

### 10.219.2.6 SetCipherType()

```
void gdcM::OpenSSLCryptographicMessageSyntax::SetCipherType (
    CipherTypes type ) [virtual]
```

Set Cipher [Type](#). Default is: AES256\_CIPHER

Implements [gdcM::CryptographicMessageSyntax](#).



### 10.219.2.7 SetPassword()

```
bool gdcmm::OpenSSLCryptographicMessageSyntax::SetPassword (
    const char * pass,
    size_t passLen ) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

The documentation for this class was generated from the following file:

- [gdcmmOpenSSLCryptographicMessageSyntax.h](#)

## 10.220 gdcmm::OpenSSLP7CryptoFactory Class Reference

```
#include <gdcmmOpenSSLP7CryptoFactory.h>
```

Inheritance diagram for gdcmm::OpenSSLP7CryptoFactory:

Collaboration diagram for gdcmm::OpenSSLP7CryptoFactory:

### Public Member Functions

- [OpenSSLP7CryptoFactory](#) ([CryptoLib](#) id)
- [CryptographicMessageSyntax](#) \* [CreateCMSProvider](#) ()

### Additional Inherited Members

## 10.220.1 Constructor & Destructor Documentation

### 10.220.1.1 OpenSSLP7CryptoFactory()

```
gdcmm::OpenSSLP7CryptoFactory::OpenSSLP7CryptoFactory (
    CryptoLib id ) [inline]
```

References [gdcmmDebugMacro](#).

## 10.220.2 Member Function Documentation

### 10.220.2.1 CreateCMSProvider()

```
CryptographicMessageSyntax * gdcmm::OpenSSLP7CryptoFactory::CreateCMSProvider ( ) [inline], [virtual]
```

Implements [gdcmm::CryptoFactory](#).

The documentation for this class was generated from the following file:

- [gdcmmOpenSSLP7CryptoFactory.h](#)

## 10.221 gdcmm::OpenSSLP7CryptographicMessageSyntax Class Reference

```
#include <gdcmmOpenSSLP7CryptographicMessageSyntax.h>
```

Inheritance diagram for `gdcmm::OpenSSLP7CryptographicMessageSyntax`:

Collaboration diagram for `gdcmm::OpenSSLP7CryptographicMessageSyntax`:

### Public Member Functions

- [OpenSSLP7CryptographicMessageSyntax](#) ()
- [~OpenSSLP7CryptographicMessageSyntax](#) ()
- bool [Decrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*decrypt content from a PKCS#7 envelopedData structure*
- bool [Encrypt](#) (char \*output, size\_t &outlen, const char \*array, size\_t len) const  
*create a PKCS#7 envelopedData structure*
- [CipherTypes](#) [GetCipherType](#) () const
- bool [ParseCertificateFile](#) (const char \*filename)
- bool [ParseKeyFile](#) (const char \*filename)
- void [SetCipherType](#) ([CipherTypes](#) type)
- bool [SetPassword](#) (const char \*, size\_t)

### Additional Inherited Members

#### 10.221.1 Detailed Description

Class for [CryptographicMessageSyntax](#) encryption. This is just a simple wrapper around openssl PKCS7\_encrypt functionalities

See online documentation [http://www.openssl.org/docs/crypto/PKCS7\\_encrypt.html](http://www.openssl.org/docs/crypto/PKCS7_encrypt.html)

#### 10.221.2 Constructor & Destructor Documentation

### 10.221.2.1 OpenSSLP7CryptographicMessageSyntax()

```
gdcmm::OpenSSLP7CryptographicMessageSyntax::OpenSSLP7CryptographicMessageSyntax ( )
```

### 10.221.2.2 ~OpenSSLP7CryptographicMessageSyntax()

```
gdcmm::OpenSSLP7CryptographicMessageSyntax::~~OpenSSLP7CryptographicMessageSyntax ( )
```

## 10.221.3 Member Function Documentation

### 10.221.3.1 Decrypt()

```
bool gdcmm::OpenSSLP7CryptographicMessageSyntax::Decrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [virtual]
```

decrypt content from a PKCS#7 envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.221.3.2 Encrypt()

```
bool gdcmm::OpenSSLP7CryptographicMessageSyntax::Encrypt (
    char * output,
    size_t & outlen,
    const char * array,
    size_t len ) const [virtual]
```

create a PKCS#7 envelopedData structure

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.221.3.3 GetCipherType()

```
CipherTypes gdcmm::OpenSSL7CryptographicMessageSyntax::GetCipherType ( ) const [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.221.3.4 ParseCertificateFile()

```
bool gdcmm::OpenSSL7CryptographicMessageSyntax::ParseCertificateFile (
    const char * filename ) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.221.3.5 ParseKeyFile()

```
bool gdcmm::OpenSSL7CryptographicMessageSyntax::ParseKeyFile (
    const char * filename ) [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.221.3.6 SetCipherType()

```
void gdcmm::OpenSSL7CryptographicMessageSyntax::SetCipherType (
    CipherTypes type ) [virtual]
```

Set Cipher [Type](#). Default is: AES256\_CIPHER

Implements [gdcmm::CryptographicMessageSyntax](#).

### 10.221.3.7 SetPassword()

```
bool gdcmm::OpenSSL7CryptographicMessageSyntax::SetPassword (
    const char * ,
    size_t ) [inline], [virtual]
```

Implements [gdcmm::CryptographicMessageSyntax](#).

References [gdcmmWarningMacro](#).

The documentation for this class was generated from the following file:

- [gdcmmOpenSSL7CryptographicMessageSyntax.h](#)

## 10.222 gdcm::Orientation Class Reference

class to handle [Orientation](#)

```
#include <gdcmOrientation.h>
```

### Public Types

- enum [OrientationType](#) {  
    [UNKNOWN](#) ,  
    [AXIAL](#) ,  
    [CORONAL](#) ,  
    [SAGITTAL](#) ,  
    [OBLIQUE](#) }

### Public Member Functions

- [Orientation](#) ()
- [~Orientation](#) ()
- void [Print](#) (std::ostream &) const  
    *Print.*

### Static Public Member Functions

- static const char \* [GetLabel](#) ([OrientationType](#) type)  
    *Return the label of an [Orientation](#).*
- static double [GetObliquityThresholdCosineValue](#) ()
- static [OrientationType](#) [GetType](#) (const double dircos[6])
- static void [SetObliquityThresholdCosineValue](#) (double val)  
    *ObliquityThresholdCosineValue stuff.*

### Static Protected Member Functions

- static char [GetMajorAxisFromPatientRelativeDirectionCosine](#) (double x, double y, double z)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Orientation](#) &o)

#### 10.222.1 Detailed Description

class to handle [Orientation](#)

#### 10.222.2 Member Enumeration Documentation

##### 10.222.2.1 OrientationType

```
enum gdcm::Orientation::OrientationType
```

**Enumerator**

UNKNOWN	
AXIAL	
CORONAL	
SAGITTAL	
OBLIQUE	

**10.222.3 Constructor & Destructor Documentation****10.222.3.1 Orientation()**

```
gdcm::Orientation::Orientation ( )
```

**10.222.3.2 ~Orientation()**

```
gdcm::Orientation::~~Orientation ( )
```

**10.222.4 Member Function Documentation****10.222.4.1 GetLabel()**

```
static const char * gdcm::Orientation::GetLabel (
    OrientationType type ) [static]
```

Return the label of an [Orientation](#).

**Examples**

[FixOrientation.cxx](#).

#### 10.222.4.2 GetMajorAxisFromPatientRelativeDirectionCosine()

```
static char gdcm::Orientation::GetMajorAxisFromPatientRelativeDirectionCosine (
    double x,
    double y,
    double z ) [static], [protected]
```

#### 10.222.4.3 GetObliquityThresholdCosineValue()

```
static double gdcm::Orientation::GetObliquityThresholdCosineValue ( ) [static]
```

#### 10.222.4.4 GetType()

```
static OrientationType gdcm::Orientation::GetType (
    const double dircos[6] ) [static]
```

Return the type of orientation from a direction cosines Input is an array of 6 double

#### Examples

[FixOrientation.cxx](#).

#### 10.222.4.5 Print()

```
void gdcm::Orientation::Print (
    std::ostream & ) const
```

Print.

#### 10.222.4.6 SetObliquityThresholdCosineValue()

```
static void gdcm::Orientation::SetObliquityThresholdCosineValue (
    double val ) [static]
```

ObliquityThresholdCosineValue stuff.

## 10.222.5 Friends And Related Function Documentation

### 10.222.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Orientation & o ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmOrientation.h](#)

## 10.223 gdcm::Overlay Class Reference

[Overlay](#) class.

```
#include <gdcmOverlay.h>
```

Inheritance diagram for gdcm::Overlay:

Collaboration diagram for gdcm::Overlay:

### Public Types

- enum [OverlayType](#) {  
[Invalid](#) = 0 ,  
[Graphics](#) = 1 ,  
[ROI](#) = 2 }

### Public Member Functions

- [Overlay](#) ()
- [Overlay](#) ([Overlay](#) const &ov)
- [~Overlay](#) () override
- void [Decompress](#) (std::ostream &os) const  
*Decode the internal OverlayData (packed bits) into unpacked representation.*
- unsigned short [GetBitPosition](#) () const  
*return bit position*
- unsigned short [GetBitsAllocated](#) () const  
*return bits allocated*
- unsigned short [GetColumns](#) () const  
*get columns*
- const char \* [GetDescription](#) () const



- get description*
- unsigned short [GetGroup](#) () const  
*Get Group number.*
- const signed short \* [GetOrigin](#) () const  
*get origin*
- const [ByteValue](#) & [GetOverlayData](#) () const
- unsigned short [GetRows](#) () const  
*get rows*
- const char \* [GetType](#) () const  
*get type*
- [OverlayType](#) [GetTypeAsEnum](#) () const
- bool [GetUnpackBuffer](#) (char \*buffer, size\_t len) const
- size\_t [GetUnpackBufferLength](#) () const
- bool [GrabOverlayFromPixelData](#) ([DataSet](#) const &ds)
- bool [IsEmpty](#) () const  
*Return whether or not the [Overlay](#) is empty:*
- bool [IsInPixelData](#) () const  
*return if the [Overlay](#) is stored in the pixel data or not*
- void [IsInPixelData](#) (bool b)  
*Set whether or no the OverlayData is in the Pixel Data:*
- bool [IsZero](#) () const  
*return true if all bits are set to 0*
- [Overlay](#) & [operator=](#) ([Overlay](#) const &ov)
- void [Print](#) (std::ostream &) const override  
*Print.*
- void [SetBitPosition](#) (unsigned short bitposition)  
*set bit position*
- void [SetBitsAllocated](#) (unsigned short bitsallocated)  
*set bits allocated*
- void [SetColumns](#) (unsigned short columns)  
*set columns*
- void [SetDescription](#) (const char \*description)  
*set description*
- void [SetFrameOrigin](#) (unsigned short frameorigin)  
*set frame origin*
- void [SetGroup](#) (unsigned short group)  
*Set Group number.*
- void [SetNumberOfFrames](#) (unsigned int numberofframes)  
*set number of frames*
- void [SetOrigin](#) (const signed short origin[2])  
*set origin*
- void [SetOverlay](#) (const char \*array, size\_t length)  
*set overlay from byte array + length*
- void [SetRows](#) (unsigned short rows)  
*set rows*
- void [SetType](#) (const char \*type)  
*set type*
- void [Update](#) (const [DataElement](#) &de)  
*Update overlay from data element de:*

## Static Public Member Functions

- static const char \* [GetOverlayTypeAsString](#) ([OverlayType](#) ot)
- static [OverlayType](#) [GetOverlayTypeFromString](#) (const char \*)

## Additional Inherited Members

### 10.223.1 Detailed Description

[Overlay](#) class.

Note

see [AreOverlaysInPixelData](#)

**Todo** Is there actually any way to recognize an overlay ? On images with multiple overlay I do not see any way to differentiate them (other than the group tag).

Example:

### 10.223.2 Member Enumeration Documentation

#### 10.223.2.1 OverlayType

```
enum gdcm::Overlay::OverlayType
```

Enumerator

Invalid	
Graphics	
ROI	

### 10.223.3 Constructor & Destructor Documentation

#### 10.223.3.1 Overlay() [1/2]

```
gdcm::Overlay::Overlay ( )
```

### 10.223.3.2 ~Overlay()

```
gdcm::Overlay::~~Overlay ( ) [override]
```

### 10.223.3.3 Overlay() [2/2]

```
gdcm::Overlay::Overlay (
    Overlay const & ov )
```

## 10.223.4 Member Function Documentation

### 10.223.4.1 Decompress()

```
void gdcm::Overlay::Decompress (
    std::ostream & os ) const
```

Decode the internal OverlayData (packed bits) into unpacked representation.

### 10.223.4.2 GetBitPosition()

```
unsigned short gdcm::Overlay::GetBitPosition ( ) const
```

return bit position

### 10.223.4.3 GetBitsAllocated()

```
unsigned short gdcm::Overlay::GetBitsAllocated ( ) const
```

return bits allocated

#### 10.223.4.4 GetColumns()

```
unsigned short gdcM::Overlay::GetColumns ( ) const
```

get columns

#### 10.223.4.5 GetDescription()

```
const char * gdcM::Overlay::GetDescription ( ) const
```

get description

#### 10.223.4.6 GetGroup()

```
unsigned short gdcM::Overlay::GetGroup ( ) const
```

Get Group number.

#### 10.223.4.7 GetOrigin()

```
const signed short * gdcM::Overlay::GetOrigin ( ) const
```

get origin

#### 10.223.4.8 GetOverlayData()

```
const ByteValue & gdcM::Overlay::GetOverlayData ( ) const
```

Return the [Overlay](#) Data as [ByteValue](#): Not thread safe

#### 10.223.4.9 GetOverlayTypeAsString()

```
static const char * gdcM::Overlay::GetOverlayTypeAsString (
    OverlayType ot ) [static]
```

#### 10.223.4.10 GetOverlayTypeFromString()

```
static OverlayType gdcm::Overlay::GetOverlayTypeFromString (
    const char * ) [static]
```

#### 10.223.4.11 GetRows()

```
unsigned short gdcm::Overlay::GetRows ( ) const
```

get rows

#### 10.223.4.12 GetType()

```
const char * gdcm::Overlay::GetType ( ) const
```

get type

#### 10.223.4.13 GetTypeAsEnum()

```
OverlayType gdcm::Overlay::GetTypeAsEnum ( ) const
```

#### 10.223.4.14 GetUnpackBuffer()

```
bool gdcm::Overlay::GetUnpackBuffer (
    char * buffer,
    size_t len ) const
```

Retrieve the unpack buffer for [Overlay](#). This is an error if the size is below [GetUnpackBufferLength\(\)](#)

#### 10.223.4.15 GetUnpackBufferLength()

```
size_t gdcm::Overlay::GetUnpackBufferLength ( ) const
```

Retrieve the size of the buffer needed to hold the [Overlay](#) as specified by Col & Row parameters

**10.223.4.16 GrabOverlayFromPixelData()**

```
bool gdcm::Overlay::GrabOverlayFromPixelData (
    DataSet const & ds )
```

**10.223.4.17 IsEmpty()**

```
bool gdcm::Overlay::IsEmpty ( ) const
```

Return whether or not the [Overlay](#) is empty:

**10.223.4.18 IsInPixelData() [1/2]**

```
bool gdcm::Overlay::IsInPixelData ( ) const
```

return if the [Overlay](#) is stored in the pixel data or not

**10.223.4.19 IsInPixelData() [2/2]**

```
void gdcm::Overlay::IsInPixelData (
    bool b )
```

Set whether or no the OverlayData is in the Pixel Data:

**10.223.4.20 IsZero()**

```
bool gdcm::Overlay::IsZero ( ) const
```

return true if all bits are set to 0

**10.223.4.21 operator=()**

```
Overlay & gdcm::Overlay::operator= (
    Overlay const & ov )
```

#### 10.223.4.22 Print()

```
void gdcm::Overlay::Print (
    std::ostream & ) const [override], [virtual]
```

Print.

Reimplemented from [gdcm::Object](#).

#### 10.223.4.23 SetBitPosition()

```
void gdcm::Overlay::SetBitPosition (
    unsigned short bitposition )
```

set bit position

#### 10.223.4.24 SetBitsAllocated()

```
void gdcm::Overlay::SetBitsAllocated (
    unsigned short bitsallocated )
```

set bits allocated

#### 10.223.4.25 SetColumns()

```
void gdcm::Overlay::SetColumns (
    unsigned short columns )
```

set columns

#### 10.223.4.26 SetDescription()

```
void gdcm::Overlay::SetDescription (
    const char * description )
```

set description

**10.223.4.27 SetFrameOrigin()**

```
void gdcm::Overlay::SetFrameOrigin (
    unsigned short frameorigin )
```

set frame origin

**10.223.4.28 SetGroup()**

```
void gdcm::Overlay::SetGroup (
    unsigned short group )
```

Set Group number.

**10.223.4.29 SetNumberOfFrames()**

```
void gdcm::Overlay::SetNumberOfFrames (
    unsigned int numberofframes )
```

set number of frames

**10.223.4.30 SetOrigin()**

```
void gdcm::Overlay::SetOrigin (
    const signed short origin[2] )
```

set origin

**10.223.4.31 SetOverlay()**

```
void gdcm::Overlay::SetOverlay (
    const char * array,
    size_t length )
```

set overlay from byte array + length



#### 10.223.4.32 SetRows()

```
void gdcm::Overlay::SetRows (
    unsigned short rows )
```

set rows

#### 10.223.4.33 SetType()

```
void gdcm::Overlay::SetType (
    const char * type )
```

set type

#### 10.223.4.34 Update()

```
void gdcm::Overlay::Update (
    const DataElement & de )
```

Update overlay from data element de:

The documentation for this class was generated from the following file:

- [gdcmOverlay.h](#)

## 10.224 gdcm::ParseException Class Reference

[ParseException](#) Standard exception handling object.

```
#include <gdcmParseException.h>
```

Inheritance diagram for `gdcm::ParseException`:

Collaboration diagram for `gdcm::ParseException`:

### Public Member Functions

- [ParseException](#) ()=default
- [ParseException](#) (const [ParseException](#) &orig)
- [~ParseException](#) () override throw ()
- const [DataElement](#) & [GetLastElement](#) () const
- [ParseException](#) & [operator=](#) (const [ParseException](#) &orig)
- void [SetLastElement](#) ([DataElement](#) &de)

### 10.224.1 Detailed Description

[ParseException](#) Standard exception handling object.

### 10.224.2 Constructor & Destructor Documentation

#### 10.224.2.1 ParseException() [1/2]

```
gdcM::ParseException::ParseException ( ) [default]
```

#### 10.224.2.2 ~ParseException()

```
gdcM::ParseException::~~ParseException ( ) throw ( ) [inline], [override]
```

#### 10.224.2.3 ParseException() [2/2]

```
gdcM::ParseException::ParseException (
    const ParseException & orig ) [inline]
```

### 10.224.3 Member Function Documentation

#### 10.224.3.1 GetLastElement()

```
const DataElement & gdcM::ParseException::GetLastElement ( ) const [inline]
```

#### 10.224.3.2 operator=()

```
ParseException & gdcM::ParseException::operator= (
    const ParseException & orig ) [inline]
```

Assignment operator.

### 10.224.3.3 SetLastElement()

```
void gdcm::ParseException::SetLastElement (
    DataElement & de ) [inline]
```

Equivalence operator.

Referenced by [gdcm::BasicOffsetTable::Read\(\)](#), [gdcm::Fragment::ReadBacktrack\(\)](#), and [gdcm::Fragment::ReadValue\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmParseException.h](#)

## 10.225 gdcm::Parser Class Reference

[Parser](#) ala XML\_Parser from expat (SAX)

```
#include <gdcmParser.h>
```

### Public Types

- typedef void(\* [EndElementHandler](#)) (void \*userData, const [Tag](#) &name)
- enum [ErrorType](#) {
  - [NoError](#) ,
  - [NoMemoryError](#) ,
  - [SyntaxError](#) ,
  - [NoElementsError](#) ,
  - [TagMismatchError](#) ,
  - [DuplicateAttributeError](#) ,
  - [JunkAfterDocElementError](#) ,
  - [UndefinedEntityError](#) ,
  - [UnexpectedStateError](#) }
- typedef void(\* [StartElementHandler](#)) (void \*userData, const [Tag](#) &tag, const char \*atts[])

### Public Member Functions

- [Parser](#) ()
- [~Parser](#) ()
- unsigned long [GetCurrentByteIndex](#) () const
- [ErrorType](#) [GetErrorCode](#) () const
- void \* [GetUserData](#) () const
- bool [Parse](#) (const char \*s, int len, bool isFinal)
- void [SetElementHandler](#) ([StartElementHandler](#) start, [EndElementHandler](#) end)
- void [SetUserData](#) (void \*userData)

## Static Public Member Functions

- static const char \* [GetErrorString](#) ([ErrorType](#) const &err)

## Protected Member Functions

- char \* [GetBuffer](#) (int len)
- bool [ParseBuffer](#) (int len, bool isFinal)
- [ErrorType](#) [Process](#) ()

### 10.225.1 Detailed Description

[Parser](#) ala XML\_Parser from expat (SAX)

Detailed description here

#### Note

Simple API for DICOM

### 10.225.2 Member Typedef Documentation

#### 10.225.2.1 EndElementHandler

```
typedef void(* gdcM::Parser::EndElementHandler) (void *userData, const Tag &name)
```

#### 10.225.2.2 StartElementHandler

```
typedef void(* gdcM::Parser::StartElementHandler) (void *userData, const Tag &tag, const char  
*atts[])
```

### 10.225.3 Member Enumeration Documentation

#### 10.225.3.1 ErrorType

```
enum gdcM::Parser::ErrorType
```

**Enumerator**

NoError	
NoMemoryError	
SyntaxError	
NoElementsError	
TagMismatchError	
DuplicateAttributeError	
JunkAfterDocElementError	
UndefinedEntityError	
UnexpectedStateError	

**10.225.4 Constructor & Destructor Documentation****10.225.4.1 Parser()**

```
gdcm::Parser::Parser ( ) [inline]
```

**10.225.4.2 ~Parser()**

```
gdcm::Parser::~~Parser ( ) [inline]
```

**10.225.5 Member Function Documentation****10.225.5.1 GetBuffer()**

```
char * gdcm::Parser::GetBuffer (
    int len ) [protected]
```

**10.225.5.2 GetCurrentByteIndex()**

```
unsigned long gdcm::Parser::GetCurrentByteIndex ( ) const
```

#### 10.225.5.3 GetErrorCode()

```
ErrorType gdcm::Parser::GetErrorCode ( ) const
```

#### 10.225.5.4 GetErrorString()

```
static const char * gdcm::Parser::GetErrorString (
    ErrorType const & err ) [static]
```

#### 10.225.5.5 GetUserData()

```
void * gdcm::Parser::GetUserData ( ) const
```

#### 10.225.5.6 Parse()

```
bool gdcm::Parser::Parse (
    const char * s,
    int len,
    bool isFinal )
```

#### 10.225.5.7 ParseBuffer()

```
bool gdcm::Parser::ParseBuffer (
    int len,
    bool isFinal ) [protected]
```

#### 10.225.5.8 Process()

```
ErrorType gdcm::Parser::Process ( ) [protected]
```

### 10.225.5.9 SetElementHandler()

```
void gdcmm::Parser::SetElementHandler (
    StartElementHandler start,
    EndElementHandler end )
```

### 10.225.5.10 SetUserData()

```
void gdcmm::Parser::SetUserData (
    void * userData )
```

The documentation for this class was generated from the following file:

- [gdcmmParser.h](#)

## 10.226 gdcmm::Patient Class Reference

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

```
#include <gdcmmPatient.h>
```

### Public Member Functions

- [Patient](#) ()=default

### 10.226.1 Detailed Description

See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.

### 10.226.2 Constructor & Destructor Documentation

#### 10.226.2.1 Patient()

```
gdcmm::Patient::Patient ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmmPatient.h](#)

## 10.227 gdcm::network::PDataTFPDU Class Reference

[PDataTFPDU](#).

```
#include <gdcmPDataTFPDU.h>
```

Inheritance diagram for gdcm::network::PDataTFPDU:

Collaboration diagram for gdcm::network::PDataTFPDU:

### Public Types

- typedef std::vector< [PresentationDataValue](#) >::size\_type [SizeType](#)

### Public Member Functions

- [PDataTFPDU](#) ()
- void [AddPresentationDataValue](#) ([PresentationDataValue](#) const &pdv)
- [SizeType](#) [GetNumberOfPresentationDataValues](#) () const
- [PresentationDataValue](#) const & [GetPresentationDataValue](#) ([SizeType](#) i) const
- bool [IsLastFragment](#) () const override
- void [Print](#) (std::ostream &os) const override
- std::istream & [Read](#) (std::istream &is) override
- size\_t [Size](#) () const override
- const std::ostream & [Write](#) (std::ostream &os) const override

### Protected Member Functions

- std::istream & [ReadInto](#) (std::istream &is, std::ostream &os)

## 10.227.1 Detailed Description

[PDataTFPDU](#).

[Table](#) 9-22 P-DATA-TF PDU FIELDS

## 10.227.2 Member Typedef Documentation

### 10.227.2.1 SizeType

```
typedef std::vector<PresentationDataValue>::size_type gdcm::network::PDataTFPDU::SizeType
```



### 10.227.3 Constructor & Destructor Documentation

#### 10.227.3.1 PDataTFPDU()

```
gdcm::network::PDataTFPDU::PDataTFPDU ( )
```

### 10.227.4 Member Function Documentation

#### 10.227.4.1 AddPresentationDataValue()

```
void gdcm::network::PDataTFPDU::AddPresentationDataValue (
    PresentationDataValue const & pdv ) [inline]
```

#### 10.227.4.2 GetNumberOfPresentationDataValues()

```
SizeType gdcm::network::PDataTFPDU::GetNumberOfPresentationDataValues ( ) const [inline]
```

#### 10.227.4.3 GetPresentationDataValue()

```
PresentationDataValue const & gdcm::network::PDataTFPDU::GetPresentationDataValue (
    SizeType i ) const [inline]
```

#### 10.227.4.4 IsLastFragment()

```
bool gdcm::network::PDataTFPDU::IsLastFragment ( ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 10.227.4.5 Print()

```
void gdcm::network::PDataTFPDU::Print (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 10.227.4.6 Read()

```
std::istream & gdcm::network::PDataTFPDU::Read (
    std::istream & is ) [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 10.227.4.7 ReadInto()

```
std::istream & gdcm::network::PDataTFPDU::ReadInto (
    std::istream & is,
    std::ostream & os ) [protected]
```

#### 10.227.4.8 Size()

```
size_t gdcm::network::PDataTFPDU::Size ( ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

#### 10.227.4.9 Write()

```
const std::ostream & gdcm::network::PDataTFPDU::Write (
    std::ostream & os ) const [override], [virtual]
```

Implements [gdcm::network::BasePDU](#).

The documentation for this class was generated from the following file:

- [gdcmPDataTFPDU.h](#)

## 10.228 gdcm::PDBelement Class Reference

Class to represent a PDB [Element](#).

```
#include <gdcmPDBelement.h>
```

Collaboration diagram for gdcm::PDBelement:

### Public Member Functions

- [PDBelement](#) ()=default
- const char \* [GetName](#) () const  
*Set/Get Name.*
- const char \* [GetValue](#) () const  
*Set/Get Value.*
- bool [operator==](#) (const [PDBelement](#) &de) const
- void [SetName](#) (const char \*name)
- void [SetValue](#) (const char \*value)

### Protected Attributes

- std::string [NameField](#)
- std::string [ValueField](#)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [PDBelement](#) &val)

### 10.228.1 Detailed Description

Class to represent a PDB [Element](#).

See also

[PDBHeader](#)

### 10.228.2 Constructor & Destructor Documentation

#### 10.228.2.1 PDBelement()

```
gdcm::PDBelement::PDBelement ( ) [default]
```

### 10.228.3 Member Function Documentation

#### 10.228.3.1 GetName()

```
const char * gdcm::PDBElement::GetName ( ) const [inline]
```

Set/Get Name.

#### 10.228.3.2 GetValue()

```
const char * gdcm::PDBElement::GetValue ( ) const [inline]
```

Set/Get [Value](#).

#### 10.228.3.3 operator==( )

```
bool gdcm::PDBElement::operator== (
    const PDBElement & de ) const [inline]
```

References [NameField](#), and [ValueField](#).

#### 10.228.3.4 SetName()

```
void gdcm::PDBElement::SetName (
    const char * name ) [inline]
```

#### 10.228.3.5 SetValue()

```
void gdcm::PDBElement::SetValue (
    const char * value ) [inline]
```

### 10.228.4 Friends And Related Function Documentation

#### 10.228.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const PDBElement & val ) [friend]
```

### 10.228.5 Member Data Documentation

#### 10.228.5.1 NameField

```
std::string gdcm::PDBElement::NameField [protected]
```

Referenced by [operator==\(\)](#).

#### 10.228.5.2 ValueField

```
std::string gdcm::PDBElement::ValueField [protected]
```

Referenced by [operator==\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmPDBElement.h](#)

## 10.229 gdcm::PDBHeader Class Reference

Class for [PDBHeader](#).

```
#include <gdcmPDBHeader.h>
```

### Public Member Functions

- [PDBHeader](#) ()=default
- [~PDBHeader](#) ()=default
- bool [FindPDBElementByName](#) (const char \*name)  
*Return true if the PDB element matching name is found or not.*
- const [PDBElement](#) & [GetPDBElementByName](#) (const char \*name)
- bool [LoadFromDataElement](#) ([DataElement](#) const &de)  
*Load the PDB Header from a [DataElement](#) of a [DataSet](#).*
- void [Print](#) (std::ostream &os) const  
*Print.*

## Static Public Member Functions

- static const [PrivateTag](#) & [GetPDBInfoTag](#) ()

*Return the Private [Tag](#) where the PDB header is stored within a DICOM [DataSet](#).*

## Protected Member Functions

- const [PDBElement](#) & [GetPDBEEnd](#) () const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [PDBHeader](#) &d)

### 10.229.1 Detailed Description

Class for [PDBHeader](#).

GEMS MR [Image](#) have an [Attribute](#) (0025,1b,GEMS\_SERS\_01) which store the Acquisition parameter of the MR [Image](#). It is compressed and can therefore not be used as is. This class de-encapsulated the Protocol Data Block and allow users to query element by name.

#### Warning

Everything you do with this code is at your own risk, since decoding process was not written from specification documents.

: the API of this class might change.

: SEDESC is not always pure ASCII it can contains latin1

See also

[CSAHeader](#)

### 10.229.2 Constructor & Destructor Documentation

#### 10.229.2.1 PDBHeader()

```
gdcm::PDBHeader::PDBHeader ( ) [default]
```

### 10.229.2.2 ~PDBHeader()

```
gdcm::PDBHeader::~~PDBHeader ( ) [default]
```

## 10.229.3 Member Function Documentation

### 10.229.3.1 FindPDBelementByName()

```
bool gdcm::PDBHeader::FindPDBelementByName (
    const char * name )
```

Return true if the PDB element matching name is found or not.

### 10.229.3.2 GetPDBeEnd()

```
const PDBelement & gdcm::PDBHeader::GetPDBeEnd ( ) const [protected]
```

### 10.229.3.3 GetPDBelementByName()

```
const PDBelement & gdcm::PDBHeader::GetPDBelementByName (
    const char * name )
```

Lookup in the PDB header if a PDB element match the name 'name':

#### Warning

Case Sensitive

### 10.229.3.4 GetPDBInfoTag()

```
static const PrivateTag & gdcm::PDBHeader::GetPDBInfoTag ( ) [static]
```

Return the Private [Tag](#) where the PDB header is stored within a DICOM [DataSet](#).

### 10.229.3.5 LoadFromDataElement()

```
bool gdcM::PDBHeader::LoadFromDataElement (
    DataElement const & de )
```

Load the PDB Header from a [DataElement](#) of a [DataSet](#).

### 10.229.3.6 Print()

```
void gdcM::PDBHeader::Print (
    std::ostream & os ) const
```

Print.

## 10.229.4 Friends And Related Function Documentation

### 10.229.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const PDBHeader & d ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcM\\_PDBHeader.h](#)

## 10.230 gdcM::PDFCodec Class Reference

[PDFCodec](#) class.

```
#include <gdcM_PDFCodec.h>
```

Inheritance diagram for gdcM::PDFCodec:

Collaboration diagram for gdcM::PDFCodec:



## Public Member Functions

- [PDFCodec](#) ()
- [~PDFCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*

## Additional Inherited Members

### 10.230.1 Detailed Description

[PDFCodec](#) class.

### 10.230.2 Constructor & Destructor Documentation

#### 10.230.2.1 PDFCodec()

```
gdcm::PDFCodec::PDFCodec ( )
```

#### 10.230.2.2 ~PDFCodec()

```
gdcm::PDFCodec::~~PDFCodec ( ) [override]
```

### 10.230.3 Member Function Documentation

#### 10.230.3.1 CanCode()

```
bool gdcm::PDFCodec::CanCode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Implements [gdcm::Coder](#).

### 10.230.3.2 CanDecode()

```
bool gdcM::PDFCodec::CanDecode (
    TransferSyntax const & ) const [inline], [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Implements [gdcM::Decoder](#).

### 10.230.3.3 Decode()

```
bool gdcM::PDFCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcM::Decoder](#).

The documentation for this class was generated from the following file:

- [gdcMPDFCodec.h](#)

## 10.231 gdcM::network::PDUFactory Class Reference

[PDUFactory](#) basically, given an initial byte, construct the.

```
#include <gdcM_PDUFactory.h>
```

### Static Public Member Functions

- static [BasePDU](#) \* [ConstructAbortPDU](#) ()
- static [BasePDU](#) \* [ConstructPDU](#) (uint8\_t itemtype)
- static [BasePDU](#) \* [ConstructReleasePDU](#) ()
- static std::vector< [BasePDU](#) \* > [CreateCEchoPDU](#) (const [ULConnection](#) &inConnection)
- static std::vector< [BasePDU](#) \* > [CreateCFindPDU](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [BasePDU](#) \* > [CreateCMovePDU](#) (const [ULConnection](#) &inConnection, const [BaseRootQuery](#) \*inRootQuery)
- static std::vector< [BasePDU](#) \* > [CreateCStoreRQPDU](#) (const [ULConnection](#) &inConnection, const [File](#) &file, bool writeDataSet=true)
- static std::vector< [BasePDU](#) \* > [CreateCStoreRSPDU](#) (const [DataSet](#) \*inDataSet, const [BasePDU](#) \*inPC)
- static std::vector< [BasePDU](#) \* > [CreateNActionPDU](#) (const [ULConnection](#) &inConnection, const [BaseQuery](#) \*inQuery)

- static std::vector< BasePDU \* > CreateNCreatePDU (const ULConnection &inConnection, const BaseQuery \*inQuery)
- static std::vector< BasePDU \* > CreateNDeletePDU (const ULConnection &inConnection, const BaseQuery \*inQuery)
- static std::vector< BasePDU \* > CreateNEventReportPDU (const ULConnection &inConnection, const BaseQuery \*inQuery)
- static std::vector< BasePDU \* > CreateNGetPDU (const ULConnection &inConnection, const BaseQuery \*inQuery)
- static std::vector< BasePDU \* > CreateNSetPDU (const ULConnection &inConnection, const BaseQuery \*inQuery)
- static EEventID DetermineEventByPDU (const BasePDU \*inPDU)
- static std::vector< PresentationDataValue > GetPDVs (const std::vector< BasePDU \* > &inDataPDUs)

### 10.231.1 Detailed Description

PDUFactory basically, given an initial byte, construct the

appropriate PDU. This way, the event loop doesn't have to know about all the different PDU types.

### 10.231.2 Member Function Documentation

#### 10.231.2.1 ConstructAbortPDU()

```
static BasePDU * gdcmm::network::PDUFactory::ConstructAbortPDU ( ) [static]
```

#### 10.231.2.2 ConstructPDU()

```
static BasePDU * gdcmm::network::PDUFactory::ConstructPDU (
    uint8_t itemtype ) [static]
```

#### 10.231.2.3 ConstructReleasePDU()

```
static BasePDU * gdcmm::network::PDUFactory::ConstructReleasePDU ( ) [static]
```

#### 10.231.2.4 CreateCEchoPDU()

```
static std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCEchoPDU (
    const ULConnection & inConnection ) [static]
```

#### 10.231.2.5 CreateCFindPDU()

```
static std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCFindPDU (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [static]
```

#### 10.231.2.6 CreateCMovePDU()

```
static std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCMovePDU (
    const ULConnection & inConnection,
    const BaseRootQuery * inRootQuery ) [static]
```

#### 10.231.2.7 CreateCStoreRQPDU()

```
static std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCStoreRQPDU (
    const ULConnection & inConnection,
    const File & file,
    bool writeDataSet = true ) [static]
```

#### 10.231.2.8 CreateCStoreRSPPDU()

```
static std::vector< BasePDU * > gdcm::network::PDUFactory::CreateCStoreRSPPDU (
    const DataSet * inDataSet,
    const BasePDU * inPC ) [static]
```

#### 10.231.2.9 CreateNActionPDU()

```
static std::vector< BasePDU * > gdcm::network::PDUFactory::CreateNActionPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.231.2.10 CreateNCreatePDU()

```
static std::vector< BasePDU * > gdcmm::network::PDUFactory::CreateNCreatePDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.231.2.11 CreateNDeletePDU()

```
static std::vector< BasePDU * > gdcmm::network::PDUFactory::CreateNDeletePDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.231.2.12 CreateNEventReportPDU()

```
static std::vector< BasePDU * > gdcmm::network::PDUFactory::CreateNEventReportPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.231.2.13 CreateNGetPDU()

```
static std::vector< BasePDU * > gdcmm::network::PDUFactory::CreateNGetPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.231.2.14 CreateNSetPDU()

```
static std::vector< BasePDU * > gdcmm::network::PDUFactory::CreateNSetPDU (
    const ULConnection & inConnection,
    const BaseQuery * inQuery ) [static]
```

#### 10.231.2.15 DetermineEventByPDU()

```
static EEventID gdcmm::network::PDUFactory::DetermineEventByPDU (
    const BasePDU * inPDU ) [static]
```

### 10.231.2.16 GetPDVs()

```
static std::vector< PresentationDataValue > gdcmm::network::PDUFactory::GetPDVs (
    const std::vector< BasePDU * > & inDataPDUs ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmmPDUFactory.h](#)

## 10.232 gdcmm::PersonName Class Reference

[PersonName](#) class.

```
#include <gdcmmPersonName.h>
```

### Public Member Functions

- unsigned int [GetMaxLength](#) () const
- unsigned int [GetNumberOfComponents](#) () const
- void [Print](#) (std::ostream &os) const
- void [SetBlob](#) (const std::vector< char > &v)
- void [SetComponents](#) (const char \*comp1="", const char \*comp2="", const char \*comp3="", const char \*comp4="", const char \*comp5="")
- void [SetComponents](#) (const char \*components[])

### Public Attributes

- char [Component](#) [[MaxNumberOfComponents](#)][[MaxLength](#)+1]

### Static Public Attributes

- static const unsigned int [MaxLength](#) = 64
- static const unsigned int [MaxNumberOfComponents](#) = 5
- static const char [Padding](#) = ' '
- static const char [Separator](#) = '^'

### 10.232.1 Detailed Description

[PersonName](#) class.

### 10.232.2 Member Function Documentation

### 10.232.2.1 GetMaxLength()

```
unsigned int gdcm::PersonName::GetMaxLength ( ) const [inline]
```

### 10.232.2.2 GetNumberOfComponents()

```
unsigned int gdcm::PersonName::GetNumberOfComponents ( ) const [inline]
```

### 10.232.2.3 Print()

```
void gdcm::PersonName::Print (
    std::ostream & os ) const [inline]
```

### 10.232.2.4 SetBlob()

```
void gdcm::PersonName::SetBlob (
    const std::vector< char > & v ) [inline]
```

### 10.232.2.5 SetComponents() [1/2]

```
void gdcm::PersonName::SetComponents (
    const char * comp1 = "",
    const char * comp2 = "",
    const char * comp3 = "",
    const char * comp4 = "",
    const char * comp5 = "" ) [inline]
```

### 10.232.2.6 SetComponents() [2/2]

```
void gdcm::PersonName::SetComponents (
    const char * components[] ) [inline]
```

### 10.232.3 Member Data Documentation

#### 10.232.3.1 Component

```
char gdcM::PersonName::Component [MaxNumberOfComponents] [MaxLength+1]
```

#### 10.232.3.2 MaxLength

```
const unsigned int gdcM::PersonName::MaxLength = 64 [static]
```

#### 10.232.3.3 MaxNumberOfComponents

```
const unsigned int gdcM::PersonName::MaxNumberOfComponents = 5 [static]
```

#### 10.232.3.4 Padding

```
const char gdcM::PersonName::Padding = ' ' [static]
```

#### 10.232.3.5 Separator

```
const char gdcM::PersonName::Separator = '^' [static]
```

The documentation for this class was generated from the following file:

- [gdcMPersonName.h](#)

## 10.233 gdcM::PGXCodec Class Reference

Class to do PGX.

```
#include <gdcMPGXCodec.h>
```

Inheritance diagram for gdcM::PGXCodec:

Collaboration diagram for gdcM::PGXCodec:



## Public Member Functions

- [PGXCodec](#) ()
- [~PGXCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [Read](#) (const char \*filename, [DataElement](#) &out) const
- bool [Write](#) (const char \*filename, const [DataElement](#) &out) const

## Additional Inherited Members

### 10.233.1 Detailed Description

Class to do PGX.

See PGX as used in JPEG 2000 implementation and reference images

### 10.233.2 Constructor & Destructor Documentation

#### 10.233.2.1 PGXCodec()

```
gdcm::PGXCodec::PGXCodec ( )
```

#### 10.233.2.2 ~PGXCodec()

```
gdcm::PGXCodec::~~PGXCodec ( ) [override]
```

### 10.233.3 Member Function Documentation

### 10.233.3.1 CanCode()

```
bool gdcm::PGXCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.233.3.2 CanDecode()

```
bool gdcm::PGXCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.233.3.3 Clone()

```
ImageCodec * gdcm::PGXCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

### 10.233.3.4 GetHeaderInfo()

```
bool gdcm::PGXCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.233.3.5 Read()

```
bool gdcm::PGXCodec::Read (
    const char * filename,
    DataElement & out ) const
```

### 10.233.3.6 Write()

```
bool gdcm::PGXCodec::Write (
    const char * filename,
    const DataElement & out ) const
```

The documentation for this class was generated from the following file:

- [gdcmPGXCodec.h](#)

## 10.234 gdcm::PhotometricInterpretation Class Reference

Class to represent an [PhotometricInterpretation](#).

```
#include <gdcmPhotometricInterpretation.h>
```

### Public Types

- enum [PType](#) {  
    [UNKNOWN](#) = 0 ,  
    [MONOCHROME1](#) ,  
    [MONOCHROME2](#) ,  
    [PALETTE\\_COLOR](#) ,  
    [RGB](#) ,  
    [HSV](#) ,  
    [ARGB](#) ,  
    [CMYK](#) ,  
    [YBR\\_FULL](#) ,  
    [YBR\\_FULL\\_422](#) ,  
    [YBR\\_PARTIAL\\_422](#) ,  
    [YBR\\_PARTIAL\\_420](#) ,  
    [YBR\\_ICT](#) ,  
    [YBR\\_RCT](#) ,  
    [PI\\_END](#) }

### Public Member Functions

- [PhotometricInterpretation](#) ([PType](#) pi=[UNKNOWN](#))
- unsigned short [GetSamplesPerPixel](#) () const  
    *return the value for Sample Per Pixel associated with a particular Photometric Interpretation*
- const char \* [GetString](#) () const
- [PType](#) [GetType](#) () const
- bool [IsLossless](#) () const
- bool [IsLossy](#) () const
- bool [IsSameColorSpace](#) ([PhotometricInterpretation](#) const &pi) const
- [operator PType](#) () const

## Static Public Member Functions

- static const char \* [GetPIString](#) ([PIType](#) pi)
- static [PIType](#) [GetPIType](#) (const char \*pi)
- static bool [IsRetired](#) ([PIType](#) pi)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [PhotometricInterpretation](#) &pi)

### 10.234.1 Detailed Description

Class to represent an [PhotometricInterpretation](#).

#### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [ExtractImageRegion.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [HelloVizWorld.cxx](#), [MpegVideoInfo.cs](#), [csa2img.cxx](#), and [iU22tomultisc.cxx](#).

### 10.234.2 Member Enumeration Documentation

#### 10.234.2.1 PIType

```
enum gdcm::PhotometricInterpretation::PIType
```

##### Enumerator

UNKNOWN	
MONOCHROME1	
MONOCHROME2	
PALETTE_COLOR	
RGB	
HSV	
ARGB	
CMYK	
YBR_FULL	
YBR_FULL_422	
YBR_PARTIAL_422	
YBR_PARTIAL_420	
YBR_ICT	
YBR_RCT	
PI_END	

## Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), and [MpegVideoInfo.cs](#).

## 10.234.3 Constructor & Destructor Documentation

### 10.234.3.1 PhotometricInterpretation()

```
gdcm::PhotometricInterpretation::PhotometricInterpretation (
    PType pi = UNKNOWN ) [inline]
```

## 10.234.4 Member Function Documentation

### 10.234.4.1 GetPIString()

```
static const char * gdcm::PhotometricInterpretation::GetPIString (
    PType pi ) [static]
```

### 10.234.4.2 GetPType()

```
static PType gdcm::PhotometricInterpretation::GetPType (
    const char * pi ) [static]
```

### 10.234.4.3 GetSamplesPerPixel()

```
unsigned short gdcm::PhotometricInterpretation::GetSamplesPerPixel ( ) const
```

return the value for Sample Per Pixel associated with a particular Photometric Interpretation

#### 10.234.4.4 GetString()

```
const char * gdcm::PhotometricInterpretation::GetString ( ) const
```

#### 10.234.4.5 GetType()

```
PIType gdcm::PhotometricInterpretation::GetType ( ) const [inline]
```

#### 10.234.4.6 IsLossless()

```
bool gdcm::PhotometricInterpretation::IsLossless ( ) const
```

#### 10.234.4.7 IsLossy()

```
bool gdcm::PhotometricInterpretation::IsLossy ( ) const
```

#### 10.234.4.8 IsRetired()

```
static bool gdcm::PhotometricInterpretation::IsRetired (
    PIType pi ) [static]
```

#### 10.234.4.9 IsSameColorSpace()

```
bool gdcm::PhotometricInterpretation::IsSameColorSpace (
    PhotometricInterpretation const & pi ) const
```

#### 10.234.4.10 operator PIType()

```
gdcm::PhotometricInterpretation::operator PIType ( ) const [inline]
```

## 10.234.5 Friends And Related Function Documentation

### 10.234.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const PhotometricInterpretation & pi ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmPhotometricInterpretation.h](#)

## 10.235 gdcm::PixelFormat Class Reference

[PixelFormat](#).

```
#include <gdcmPixelFormat.h>
```

### Public Types

- enum [ScalarType](#) {  
    UINT8 ,  
    INT8 ,  
    UINT12 ,  
    INT12 ,  
    UINT16 ,  
    INT16 ,  
    UINT32 ,  
    INT32 ,  
    UINT64 ,  
    INT64 ,  
    FLOAT16 ,  
    FLOAT32 ,  
    FLOAT64 ,  
    SINGLEBIT ,  
    UNKNOWN }

## Public Member Functions

- [PixelFormat](#) ()
- [PixelFormat](#) ([ScalarType](#) st)
- [PixelFormat](#) (unsigned short samplesperpixel, unsigned short bitsallocated=8, unsigned short bitsstored=8, unsigned short highbit=7, unsigned short pixelrepresentation=0)
- unsigned short [GetBitsAllocated](#) () const  
*BitsAllocated see [Tag](#) (0028,0100) US Bits Allocated.*
- unsigned short [GetBitsStored](#) () const  
*BitsStored see [Tag](#) (0028,0101) US Bits Stored.*
- unsigned short [GetHighBit](#) () const  
*HighBit see [Tag](#) (0028,0102) US High Bit.*
- int64\_t [GetMax](#) () const  
*return the max possible of the pixel*
- int64\_t [GetMin](#) () const  
*return the min possible of the pixel*
- unsigned short [GetPixelRepresentation](#) () const  
*PixelRepresentation: 0 or 1, see [Tag](#) (0028,0103) US Pixel Representation.*
- uint8\_t [GetPixelSize](#) () const
- unsigned short [GetSamplesPerPixel](#) () const
- [ScalarType](#) [GetScalarType](#) () const  
*ScalarType does not take into account the sample per pixel.*
- const char \* [GetScalarTypeAsString](#) () const
- bool [IsCompatible](#) (const [TransferSyntax](#) &ts) const
- bool [IsValid](#) () const  
*return IsValid*
- [operator ScalarType](#) () const
- bool [operator!=](#) (const [PixelFormat](#) &pf) const
- bool [operator!=](#) ([ScalarType](#) st) const
- bool [operator==](#) (const [PixelFormat](#) &pf) const
- bool [operator==](#) ([ScalarType](#) st) const
- void [Print](#) (std::ostream &os) const  
*Print.*
- void [SetBitsAllocated](#) (unsigned short ba)
- void [SetBitsStored](#) (unsigned short bs)
- void [SetHighBit](#) (unsigned short hb)
- void [SetPixelRepresentation](#) (unsigned short pr)
- void [SetSamplesPerPixel](#) (unsigned short spp)
- void [SetScalarType](#) ([ScalarType](#) st)

## Protected Member Functions

- bool [Validate](#) ()  
*When image with 24/24/23 was read, need to validate.*

## Friends

- class [Bitmap](#)
- std::ostream & [operator<<](#) (std::ostream &\_os, const [PixelFormat](#) &pf)



## 10.235.1 Detailed Description

[PixelFormat](#).

By default the Pixel [Type](#) will be instantiated with the following parameters:

- SamplesPerPixel : 1
- BitsAllocated : 8
- BitsStored : 8
- HighBit : 7
- PixelRepresentation : 0

Fundamentally [PixelFormat](#) is very close to what DICOM allows. It will be very hard to extend this class for the upcoming DICOM standard where Floating 32 and 64bits will be allowed.

It is also very hard for this class to fully support 64bits integer type (see GetMin / GetMax signature restricted to 64bits signed).

### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [DecompressImage.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [FixJAIBugJPEGLS.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [MpegVideoInfo.cs](#), [RescaleImage.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), and [threadgdcm.cxx](#).

## 10.235.2 Member Enumeration Documentation

### 10.235.2.1 ScalarType

enum `gdcm::PixelFormat::ScalarType`

#### Enumerator

UINT8	
INT8	
UINT12	
INT12	
UINT16	
INT16	
UINT32	
INT32	
UINT64	
INT64	
FLOAT16	
FLOAT32	
FLOAT64	
SINGLEBIT	
UNKNOWN	

#### Examples

[GetArray.cs](#).

### 10.235.3 Constructor & Destructor Documentation

#### 10.235.3.1 PixelFormat() [1/3]

```
gdcm::PixelFormat::PixelFormat ( ) [inline]
```

#### 10.235.3.2 PixelFormat() [2/3]

```
gdcm::PixelFormat::PixelFormat (
    unsigned short samplesperpixel,
    unsigned short bitsallocated = 8,
    unsigned short bitsstored = 8,
    unsigned short highbit = 7,
    unsigned short pixelrepresentation = 0 ) [inline], [explicit]
```

#### 10.235.3.3 PixelFormat() [3/3]

```
gdcm::PixelFormat::PixelFormat (
    ScalarType st )
```

### 10.235.4 Member Function Documentation

#### 10.235.4.1 GetBitsAllocated()

```
unsigned short gdcm::PixelFormat::GetBitsAllocated ( ) const [inline]
```

BitsAllocated see [Tag](#) (0028,0100) US Bits Allocated.

#### Examples

[GetJPEGSamplePrecision.cxx](#).

#### 10.235.4.2 GetBitsStored()

```
unsigned short gdcm::PixelFormat::GetBitsStored ( ) const [inline]
```

BitsStored see [Tag](#) (0028,0101) US Bits Stored.

##### Examples

[GetJPEGSamplePrecision.cxx](#).

#### 10.235.4.3 GetHighBit()

```
unsigned short gdcm::PixelFormat::GetHighBit ( ) const [inline]
```

HighBit see [Tag](#) (0028,0102) US High Bit.

#### 10.235.4.4 GetMax()

```
int64_t gdcm::PixelFormat::GetMax ( ) const
```

return the max possible of the pixel

#### 10.235.4.5 GetMin()

```
int64_t gdcm::PixelFormat::GetMin ( ) const
```

return the min possible of the pixel

#### 10.235.4.6 GetPixelRepresentation()

```
unsigned short gdcm::PixelFormat::GetPixelRepresentation ( ) const [inline]
```

PixelRepresentation: 0 or 1, see [Tag](#) (0028,0103) US Pixel Representation.

#### 10.235.4.7 GetPixelSize()

```
uint8_t gdcm::PixelFormat::GetPixelSize ( ) const
```

return the size of the pixel This is the number of words it would take to store one pixel

##### Warning

the return value takes into account the SamplesPerPixel

in the rare case when BitsAllocated == 12, the function assume word padding and value returned will be identical as if BitsAllocated == 16

##### Examples

[ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), and [threadgdcm.cxx](#).

#### 10.235.4.8 GetSamplesPerPixel()

```
unsigned short gdcm::PixelFormat::GetSamplesPerPixel ( ) const
```

Samples Per Pixel see (0028,0002) US Samples Per Pixel DICOM - only allows 1, 3 and 4 as valid value. Other value are undefined behavior.

##### Examples

[threadgdcm.cxx](#).

#### 10.235.4.9 GetScalarType()

```
ScalarType gdcm::PixelFormat::GetScalarType ( ) const
```

ScalarType does not take into account the sample per pixel.

##### Examples

[GetArray.cs](#).

#### 10.235.4.10 GetScalarTypeAsString()

```
const char * gdcm::PixelFormat::GetScalarTypeAsString ( ) const
```

##### Examples

[GetArray.cs](#).

#### 10.235.4.11 IsCompatible()

```
bool gdcm::PixelFormat::IsCompatible (
    const TransferSyntax & ts ) const
```

#### 10.235.4.12 IsValid()

```
bool gdcm::PixelFormat::IsValid ( ) const
```

return IsValid

#### 10.235.4.13 operator ScalarType()

```
gdcm::PixelFormat::operator ScalarType ( ) const [inline]
```

#### 10.235.4.14 operator!=( ) [1/2]

```
bool gdcm::PixelFormat::operator!= (
    const PixelFormat & pf ) const [inline]
```

#### 10.235.4.15 operator!=( ) [2/2]

```
bool gdcm::PixelFormat::operator!= (
    ScalarType st ) const [inline]
```

**10.235.4.16 operator==( ) [1/2]**

```
bool gdcM::PixelFormat::operator== (
    const PixelFormat & pf ) const [inline]
```

**10.235.4.17 operator==( ) [2/2]**

```
bool gdcM::PixelFormat::operator== (
    ScalarType st ) const [inline]
```

**10.235.4.18 Print()**

```
void gdcM::PixelFormat::Print (
    std::ostream & os ) const
```

Print.

**10.235.4.19 SetBitsAllocated()**

```
void gdcM::PixelFormat::SetBitsAllocated (
    unsigned short ba ) [inline]
```

**10.235.4.20 SetBitsStored()**

```
void gdcM::PixelFormat::SetBitsStored (
    unsigned short bs ) [inline]
```

**10.235.4.21 SetHighBit()**

```
void gdcM::PixelFormat::SetHighBit (
    unsigned short hb ) [inline]
```

#### 10.235.4.22 SetPixelRepresentation()

```
void gdcm::PixelFormat::SetPixelRepresentation (
    unsigned short pr ) [inline]
```

##### Examples

[TemplateEmptyImage.cxx](#).

#### 10.235.4.23 SetSamplesPerPixel()

```
void gdcm::PixelFormat::SetSamplesPerPixel (
    unsigned short spp ) [inline]
```

##### Examples

[CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), and [GenFakeImage.cxx](#).

References [gdcmAssertMacro](#).

#### 10.235.4.24 SetScalarType()

```
void gdcm::PixelFormat::SetScalarType (
    ScalarType st )
```

Set [PixelFormat](#) based only on the [ScalarType](#)

##### Warning

: You need to call `SetScalarType` *before* `SetSamplesPerPixel`

#### 10.235.4.25 Validate()

```
bool gdcm::PixelFormat::Validate ( ) [protected]
```

When image with 24/24/23 was read, need to validate.

Referenced by [gdcm::Bitmap::SetPixelFormat\(\)](#).

## 10.235.5 Friends And Related Function Documentation

### 10.235.5.1 Bitmap

```
friend class Bitmap [friend]
```

### 10.235.5.2 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const PixelFormat & pf ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmPixelFormat.h](#)

## 10.236 gdcm::Pixmap Class Reference

[Pixmap](#) class.

```
#include <gdcmPixmap.h>
```

Inheritance diagram for `gdcm::Pixmap`:

Collaboration diagram for `gdcm::Pixmap`:

### Public Member Functions

- [Pixmap](#) ()
- [~Pixmap](#) () override
- bool [AreOverlaysInPixelData](#) () const override  
*returns if Overlays are stored in the unused bit of the pixel data:*
- [Curve](#) & [GetCurve](#) (size\_t i=0)  
*Curve: group 50xx.*
- const [Curve](#) & [GetCurve](#) (size\_t i=0) const
- [IconImage](#) & [GetIconImage](#) ()
- const [IconImage](#) & [GetIconImage](#) () const  
*Set/Get Icon Image.*
- size\_t [GetNumberOfCurves](#) () const
- size\_t [GetNumberOfOverlays](#) () const
- [Overlay](#) & [GetOverlay](#) (size\_t i=0)  
*Overlay: group 60xx.*
- const [Overlay](#) & [GetOverlay](#) (size\_t i=0) const
- void [Print](#) (std::ostream &) const override
- void [RemoveOverlay](#) (size\_t i)
- void [SetIconImage](#) ([IconImage](#) const &ii)
- void [SetNumberOfCurves](#) (size\_t n)
- void [SetNumberOfOverlays](#) (size\_t n)
- bool [UnusedBitsPresentInPixelData](#) () const override  
*returns if there are unused bits in the pixel data*



## Protected Attributes

- `std::vector< Curve > Curves`
- `SmartPointer< IconImage > Icon`
- `std::vector< Overlay > Overlays`

## Additional Inherited Members

### 10.236.1 Detailed Description

[Pixmap](#) class.

A bitmap based image. Used as parent for both [IconImage](#) and the main Pixel Data [Image](#) It does not contains any World Space information (IPP, IOP)

See also

[PixmapReader](#)

Examples

[FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), and [StandardizeFiles.cs](#).

### 10.236.2 Constructor & Destructor Documentation

#### 10.236.2.1 [Pixmap\(\)](#)

```
gdcm::Pixmap::Pixmap ( )
```

#### 10.236.2.2 [~Pixmap\(\)](#)

```
gdcm::Pixmap::~Pixmap ( ) [override]
```

### 10.236.3 Member Function Documentation

### 10.236.3.1 AreOverlaysInPixelData()

```
bool gdcm::Pixmap::AreOverlaysInPixelData ( ) const [override], [virtual]
```

returns if Overlays are stored in the unused bit of the pixel data:

Reimplemented from [gdcm::Bitmap](#).

### 10.236.3.2 GetCurve() [1/2]

```
Curve & gdcm::Pixmap::GetCurve (
    size_t i = 0 ) [inline]
```

[Curve](#): group 50xx.

### 10.236.3.3 GetCurve() [2/2]

```
const Curve & gdcm::Pixmap::GetCurve (
    size_t i = 0 ) const [inline]
```

### 10.236.3.4 GetIconImage() [1/2]

```
IconImage & gdcm::Pixmap::GetIconImage ( ) [inline]
```

### 10.236.3.5 GetIconImage() [2/2]

```
const IconImage & gdcm::Pixmap::GetIconImage ( ) const [inline]
```

Set/Get Icon [Image](#).

### 10.236.3.6 GetNumberOfCurves()

```
size_t gdcm::Pixmap::GetNumberOfCurves ( ) const [inline]
```

### 10.236.3.7 GetNumberOfOverlays()

```
size_t gdcm::Pixmap::GetNumberOfOverlays ( ) const [inline]
```

### 10.236.3.8 GetOverlay() [1/2]

```
Overlay & gdcm::Pixmap::GetOverlay (
    size_t i = 0 ) [inline]
```

[Overlay](#): group 60xx.

### 10.236.3.9 GetOverlay() [2/2]

```
const Overlay & gdcm::Pixmap::GetOverlay (
    size_t i = 0 ) const [inline]
```

### 10.236.3.10 Print()

```
void gdcm::Pixmap::Print (
    std::ostream & ) const [override], [virtual]
```

Reimplemented from [gdcm::Bitmap](#).

### 10.236.3.11 RemoveOverlay()

```
void gdcm::Pixmap::RemoveOverlay (
    size_t i ) [inline]
```

### 10.236.3.12 SetIconImage()

```
void gdcm::Pixmap::SetIconImage (
    IconImage const & ii ) [inline]
```

### 10.236.3.13 SetNumberOfCurves()

```
void gdcM::Pixmap::SetNumberOfCurves (
    size_t n ) [inline]
```

### 10.236.3.14 SetNumberOfOverlays()

```
void gdcM::Pixmap::SetNumberOfOverlays (
    size_t n ) [inline]
```

### 10.236.3.15 UnusedBitsPresentInPixelData()

```
bool gdcM::Pixmap::UnusedBitsPresentInPixelData ( ) const [override], [virtual]
```

returns if there are unused bits in the pixel data

Reimplemented from [gdcM::Bitmap](#).

## 10.236.4 Member Data Documentation

### 10.236.4.1 Curves

```
std::vector<Curve> gdcM::Pixmap::Curves [protected]
```

### 10.236.4.2 Icon

```
SmartPointer<IconImage> gdcM::Pixmap::Icon [protected]
```

### 10.236.4.3 Overlays

```
std::vector<Overlay> gdcM::Pixmap::Overlays [protected]
```

The documentation for this class was generated from the following file:

- [gdcMPixmap.h](#)

## 10.237 gdcm::PixmapReader Class Reference

[PixmapReader](#).

```
#include <gdcmPixmapReader.h>
```

Inheritance diagram for gdcm::PixmapReader:

Collaboration diagram for gdcm::PixmapReader:

### Public Member Functions

- [PixmapReader](#) ()
- [~PixmapReader](#) () override
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const  
*Return the read image (need to call [Read\(\)](#) first)*
- bool [Read](#) () override

### Protected Member Functions

- virtual bool [ReadACRNEMAIImage](#) ()
- virtual bool [ReadImage](#) ([MediaStorage](#) const &ms)
- bool [ReadImageInternal](#) ([MediaStorage](#) const &ms, bool handlepixeldata=true)

### Protected Attributes

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)

### 10.237.1 Detailed Description

[PixmapReader](#).

#### Note

its role is to convert the DICOM [DataSet](#) into a [Pixmap](#) representation By default it is also loading the lookup table and overlay when found as they impact the rendering or the image

See PS 3.3-2008, [Table C.7-11b](#) IMAGE PIXEL MACRO ATTRIBUTES for the list of attribute that belong to what gdcm calls a '[Pixmap](#)'

#### Warning

the API [ReadUpToTag](#) and [ReadSelectedTag](#)

#### See also

[Pixmap](#)

#### Examples

[StandardizeFiles.cs](#).

## 10.237.2 Constructor & Destructor Documentation

### 10.237.2.1 PixmapReader()

```
gdcm::PixmapReader::PixmapReader ( )
```

### 10.237.2.2 ~PixmapReader()

```
gdcm::PixmapReader::~~PixmapReader ( ) [override]
```

## 10.237.3 Member Function Documentation

### 10.237.3.1 GetPixmap() [1/2]

```
Pixmap & gdcm::PixmapReader::GetPixmap ( )
```

### 10.237.3.2 GetPixmap() [2/2]

```
const Pixmap & gdcm::PixmapReader::GetPixmap ( ) const
```

Return the read image (need to call [Read\(\)](#) first)

#### Examples

[StandardizeFiles.cs](#).

### 10.237.3.3 Read()

```
bool gdcm::PixmapReader::Read ( ) [override], [virtual]
```

Read the DICOM image. There are two reason for failure:

1. The input filename is not DICOM
2. The input DICOM file does not contains an [Pixmap](#).

Reimplemented from [gdcm::Reader](#).

#### Examples

[StandardizeFiles.cs](#).

### 10.237.3.4 ReadACRNEMAIImage()

```
virtual bool gdcm::PixmapReader::ReadACRNEMAIImage ( ) [protected], [virtual]
```

Reimplemented in [gdcm::ImageReader](#).

### 10.237.3.5 ReadImage()

```
virtual bool gdcm::PixmapReader::ReadImage (
    MediaStorage const & ms ) [protected], [virtual]
```

Reimplemented in [gdcm::ImageReader](#).

### 10.237.3.6 ReadImageInternal()

```
bool gdcm::PixmapReader::ReadImageInternal (
    MediaStorage const & ms,
    bool handlepixeldata = true ) [protected]
```

## 10.237.4 Member Data Documentation

#### 10.237.4.1 PixelData

```
SmartPointer<Pixmap> gdcM::PixmapReader::PixelData [protected]
```

The documentation for this class was generated from the following file:

- [gdcMPixmapReader.h](#)

## 10.238 gdcM::PixmapToPixmapFilter Class Reference

[PixmapToPixmapFilter](#) class.

```
#include <gdcMPixmapToPixmapFilter.h>
```

Inheritance diagram for gdcM::PixmapToPixmapFilter:

Collaboration diagram for gdcM::PixmapToPixmapFilter:

### Public Member Functions

- [PixmapToPixmapFilter](#) ()
- [~PixmapToPixmapFilter](#) ()=default
- [Pixmap](#) & [GetInput](#) ()
- const [Pixmap](#) & [GetOutput](#) () const  
*Get Output image.*
- const [Pixmap](#) & [GetOutputAsPixmap](#) () const

### Additional Inherited Members

#### 10.238.1 Detailed Description

[PixmapToPixmapFilter](#) class.

Super class for all filter taking an image and producing an output image

Examples

[StandardizeFiles.cs](#).

#### 10.238.2 Constructor & Destructor Documentation



### 10.238.2.1 PixmapToPixmapFilter()

```
gdcm::PixmapToPixmapFilter::PixmapToPixmapFilter ( )
```

### 10.238.2.2 ~PixmapToPixmapFilter()

```
gdcm::PixmapToPixmapFilter::~~PixmapToPixmapFilter ( ) [default]
```

## 10.238.3 Member Function Documentation

### 10.238.3.1 GetInput()

```
Pixmap & gdcm::PixmapToPixmapFilter::GetInput ( )
```

### 10.238.3.2 GetOutput()

```
const Pixmap & gdcm::PixmapToPixmapFilter::GetOutput ( ) const
```

Get Output image.

### 10.238.3.3 GetOutputAsPixmap()

```
const Pixmap & gdcm::PixmapToPixmapFilter::GetOutputAsPixmap ( ) const
```

The documentation for this class was generated from the following file:

- [gdcmPixmapToPixmapFilter.h](#)

## 10.239 gdcm::PixmapWriter Class Reference

[PixmapWriter](#).

```
#include <gdcmPixmapWriter.h>
```

Inheritance diagram for gdcm::PixmapWriter:

Collaboration diagram for gdcm::PixmapWriter:

## Public Member Functions

- [PixmapWriter](#) ()
- [~PixmapWriter](#) () override
- virtual [Pixmap](#) & [GetImage](#) ()
- virtual const [Pixmap](#) & [GetImage](#) () const
- [Pixmap](#) & [GetPixmap](#) ()
- const [Pixmap](#) & [GetPixmap](#) () const
- virtual void [SetImage](#) ([Pixmap](#) const &img)
- void [SetPixmap](#) ([Pixmap](#) const &img)
- bool [Write](#) () override

*Write.*

## Protected Member Functions

- void [DolconImage](#) ([DataSet](#) &ds, [Pixmap](#) const &image)
- bool [PrepareWrite](#) ([MediaStorage](#) const &refms)

## Protected Attributes

- [SmartPointer](#)< [Pixmap](#) > [PixelData](#)

### 10.239.1 Detailed Description

[PixmapWriter](#).

This class will takes two inputs:

1. The DICOM [DataSet](#)
2. The [Image](#) input It will override any info from the [Image](#) over the [DataSet](#).

For instance when one read in a lossy compressed image and write out as unencapsulated (ie implicitly lossless) then some attribute are definitely needed to mark this dataset as Lossy (typically 0028,2114)

Examples

[StandardizeFiles.cs](#).

### 10.239.2 Constructor & Destructor Documentation

### 10.239.2.1 PixmapWriter()

```
gdcm::PixmapWriter::PixmapWriter ( )
```

### 10.239.2.2 ~PixmapWriter()

```
gdcm::PixmapWriter::~~PixmapWriter ( ) [override]
```

## 10.239.3 Member Function Documentation

### 10.239.3.1 DoIconImage()

```
void gdcm::PixmapWriter::DoIconImage (
    DataSet & ds,
    Pixmap const & image ) [protected]
```

### 10.239.3.2 GetImage() [1/2]

```
virtual Pixmap & gdcm::PixmapWriter::GetImage ( ) [inline], [virtual]
```

Reimplemented in [gdcm::ImageWriter](#).

### 10.239.3.3 GetImage() [2/2]

```
virtual const Pixmap & gdcm::PixmapWriter::GetImage ( ) const [inline], [virtual]
```

Set/Get [Pixmap](#) to be written It will overwrite anything [Pixmap](#) infos found in [DataSet](#) (see parent class to see how to pass dataset)

Reimplemented in [gdcm::ImageWriter](#).

#### 10.239.3.4 GetPixmap() [1/2]

```
Pixmap & gdcm::PixmapWriter::GetPixmap ( ) [inline]
```

#### 10.239.3.5 GetPixmap() [2/2]

```
const Pixmap & gdcm::PixmapWriter::GetPixmap ( ) const [inline]
```

#### 10.239.3.6 PrepareWrite()

```
bool gdcm::PixmapWriter::PrepareWrite (
    MediaStorage const & refs ) [protected]
```

#### 10.239.3.7 SetImage()

```
virtual void gdcm::PixmapWriter::SetImage (
    Pixmap const & img ) [virtual]
```

#### Examples

[BasicImageAnonymizer.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [DecompressImage.cs](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), and [TemplateEmptyImage.cxx](#).

#### 10.239.3.8 SetPixmap()

```
void gdcm::PixmapWriter::SetPixmap (
    Pixmap const & img )
```

#### Examples

[StandardizeFiles.cs](#).

### 10.239.3.9 Write()

```
bool gdcm::PixmapWriter::Write ( ) [override], [virtual]
```

Write.

Reimplemented from [gdcm::Writer](#).

#### Examples

[StandardizeFiles.cs](#).

## 10.239.4 Member Data Documentation

### 10.239.4.1 PixelData

```
SmartPointer<Pixmap> gdcm::PixmapWriter::PixelData [protected]
```

The documentation for this class was generated from the following file:

- [gdcmPixmapWriter.h](#)

## 10.240 gdcm::PNMCodec Class Reference

Class to do PNM.

```
#include <gdcmPNMCodec.h>
```

Inheritance diagram for gdcm::PNMCodec:

Collaboration diagram for gdcm::PNMCodec:

### Public Member Functions

- [PNMCodec](#) ()
- [~PNMCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- unsigned long [GetBufferLength](#) () const
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- bool [Read](#) (const char \*filename, [DataElement](#) &out) const
- void [SetBufferLength](#) (unsigned long l)
- bool [Write](#) (const char \*filename, const [DataElement](#) &out) const

## Additional Inherited Members

### 10.240.1 Detailed Description

Class to do PNM.

PNM is the Portable anymap file format. The main web page can be found at: <http://netpbm.sourceforge.net/>↵

#### Note

Only support P5 & P6 PNM file (binary grayscale and binary rgb)

#### Examples

[ExtractIconFromFile.cxx](#).

### 10.240.2 Constructor & Destructor Documentation

#### 10.240.2.1 PNMCodec()

```
gdcmm::PNMCodec::PNMCodec ( )
```

#### 10.240.2.2 ~PNMCodec()

```
gdcmm::PNMCodec::~~PNMCodec ( ) [override]
```

### 10.240.3 Member Function Documentation

#### 10.240.3.1 CanCode()

```
bool gdcmm::PNMCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcmm::ImageCodec](#).

### 10.240.3.2 CanDecode()

```
bool gdcmm::PNMCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcmm::ImageCodec](#).

### 10.240.3.3 Clone()

```
ImageCodec * gdcmm::PNMCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcmm::ImageCodec](#).

### 10.240.3.4 GetBufferLength()

```
unsigned long gdcmm::PNMCodec::GetBufferLength ( ) const [inline]
```

### 10.240.3.5 GetHeaderInfo()

```
bool gdcmm::PNMCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcmm::ImageCodec](#).

### 10.240.3.6 Read()

```
bool gdcmm::PNMCodec::Read (
    const char * filename,
    DataElement & out ) const
```

### 10.240.3.7 SetBufferLength()

```
void gdcM::PNMCodec::SetBufferLength (
    unsigned long l ) [inline]
```

### 10.240.3.8 Write()

```
bool gdcM::PNMCodec::Write (
    const char * filename,
    const DataElement & out ) const
```

#### Examples

[ExtractIconFromFile.cxx](#).

The documentation for this class was generated from the following file:

- [gdcMPNMCodec.h](#)

## 10.241 gdcM::Preamble Class Reference

DICOM [Preamble](#) (Part 10)

```
#include <gdcM_Preamble.h>
```

### Public Member Functions

- [Preamble](#) ()
- [Preamble](#) ([Preamble](#) const &)
- [~Preamble](#) ()
- void [Clear](#) ()  
*Clear.*
- void [Create](#) ()
- const char \* [GetInternal](#) () const  
*Get internal pointer to preamble.*
- [VL GetLength](#) () const  
*Return size of [Preamble](#).*
- bool [IsEmpty](#) () const  
*Check if [Preamble](#) is empty.*
- [Preamble](#) & [operator=](#) ([Preamble](#) const &)
- void [Print](#) (std::ostream &os) const  
*Print [Preamble](#).*
- std::istream & [Read](#) (std::istream &is)  
*Read [Preamble](#).*
- void [Remove](#) ()
- void [Valid](#) ()  
*Set [Preamble](#) to the default one.*
- std::ostream const & [Write](#) (std::ostream &os) const  
*Write [Preamble](#).*



## Protected Member Functions

- bool [IsValid](#) () const

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Preamble](#) &\_val)

### 10.241.1 Detailed Description

DICOM [Preamble](#) (Part 10)

### 10.241.2 Constructor & Destructor Documentation

#### 10.241.2.1 Preamble() [1/2]

```
gdcm::Preamble::Preamble ( )
```

#### 10.241.2.2 ~Preamble()

```
gdcm::Preamble::~~Preamble ( )
```

#### 10.241.2.3 Preamble() [2/2]

```
gdcm::Preamble::Preamble (
    Preamble const & ) [inline]
```

### 10.241.3 Member Function Documentation

#### 10.241.3.1 Clear()

```
void gdcm::Preamble::Clear ( )
```

Clear.

#### 10.241.3.2 Create()

```
void gdcm::Preamble::Create ( )
```

#### 10.241.3.3 GetInternal()

```
const char * gdcm::Preamble::GetInternal ( ) const [inline]
```

Get internal pointer to preamble.

#### 10.241.3.4 GetLength()

```
VL gdcm::Preamble::GetLength ( ) const [inline]
```

Return size of [Preamble](#).

#### 10.241.3.5 IsEmpty()

```
bool gdcm::Preamble::IsEmpty ( ) const [inline]
```

Check if [Preamble](#) is empty.

#### 10.241.3.6 IsValid()

```
bool gdcm::Preamble::IsValid ( ) const [inline], [protected]
```

### 10.241.3.7 operator=()

```
Preamble & gdcm::Preamble::operator= (
    Preamble const & ) [inline]
```

### 10.241.3.8 Print()

```
void gdcm::Preamble::Print (
    std::ostream & os ) const
```

Print [Preamble](#).

### 10.241.3.9 Read()

```
std::istream & gdcm::Preamble::Read (
    std::istream & is )
```

Read [Preamble](#).

### 10.241.3.10 Remove()

```
void gdcm::Preamble::Remove ( )
```

### 10.241.3.11 Valid()

```
void gdcm::Preamble::Valid ( )
```

Set [Preamble](#) to the default one.

### 10.241.3.12 Write()

```
std::ostream const & gdcm::Preamble::Write (
    std::ostream & os ) const
```

Write [Preamble](#).

## 10.241.4 Friends And Related Function Documentation

### 10.241.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Preamble & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmPreamble.h](#)

## 10.242 gdcm::PresentationContext Class Reference

[PresentationContext](#).

```
#include <gdcmPresentationContext.h>
```

Collaboration diagram for gdcm::PresentationContext:

### Public Types

- typedef TransferSyntaxArrayType::size\_type [SizeType](#)
- typedef std::vector< std::string > [TransferSyntaxArrayType](#)

### Public Member Functions

- [PresentationContext](#) ()
- [PresentationContext](#) (UIDs::TSName asname, UIDs::TSName tsname=UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM)
- void [AddTransferSyntax](#) (const char \*tsstr)
- const char \* [GetAbstractSyntax](#) () const
- [SizeType](#) [GetNumberOfTransferSyntaxes](#) () const
- uint8\_t [GetPresentationContextID](#) () const
- const char \* [GetTransferSyntax](#) ([SizeType](#) i) const
- bool [operator==](#) (const [PresentationContext](#) &pc) const
- void [Print](#) (std::ostream &os) const
- void [SetAbstractSyntax](#) (const char \*absyn)
- void [SetPresentationContextID](#) (uint8\_t id)

### Protected Attributes

- std::string [AbstractSyntax](#)
- uint8\_t [ID](#)
- std::vector< std::string > [TransferSyntaxes](#)

## 10.242.1 Detailed Description

[PresentationContext](#).

See also

[PresentationContextAC](#) [PresentationContextRQ](#)

## 10.242.2 Member Typedef Documentation

### 10.242.2.1 SizeType

```
typedef TransferSyntaxArrayType::size_type gdcm::PresentationContext::SizeType
```

### 10.242.2.2 TransferSyntaxArrayType

```
typedef std::vector<std::string> gdcm::PresentationContext::TransferSyntaxArrayType
```

## 10.242.3 Constructor & Destructor Documentation

### 10.242.3.1 PresentationContext() [1/2]

```
gdcm::PresentationContext::PresentationContext ( )
```

### 10.242.3.2 PresentationContext() [2/2]

```
gdcm::PresentationContext::PresentationContext (
    UIDs::TSName asname,
    UIDs::TSName tname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM )
```

Initialize Presentation Context with AbstractSyntax set to asname and with a single [TransferSyntax](#) set to tname (default to Implicit [VR](#) LittleEndian when not specified ).

## 10.242.4 Member Function Documentation

### 10.242.4.1 AddTransferSyntax()

```
void gdcm::PresentationContext::AddTransferSyntax (
    const char * tsstr )
```

### 10.242.4.2 GetAbstractSyntax()

```
const char * gdcm::PresentationContext::GetAbstractSyntax ( ) const [inline]
```

### 10.242.4.3 GetNumberOfTransferSyntaxes()

```
SizeType gdcm::PresentationContext::GetNumberOfTransferSyntaxes ( ) const [inline]
```

### 10.242.4.4 GetPresentationContextID()

```
uint8_t gdcm::PresentationContext::GetPresentationContextID ( ) const
```

### 10.242.4.5 GetTransferSyntax()

```
const char * gdcm::PresentationContext::GetTransferSyntax (
    SizeType i ) const [inline]
```

### 10.242.4.6 operator==( )

```
bool gdcm::PresentationContext::operator== (
    const PresentationContext & pc ) const [inline]
```

References [AbstractSyntax](#), and [TransferSyntaxes](#).

#### 10.242.4.7 Print()

```
void gdcm::PresentationContext::Print (
    std::ostream & os ) const
```

#### 10.242.4.8 SetAbstractSyntax()

```
void gdcm::PresentationContext::SetAbstractSyntax (
    const char * absyn ) [inline]
```

#### 10.242.4.9 SetPresentationContextID()

```
void gdcm::PresentationContext::SetPresentationContextID (
    uint8_t id )
```

### 10.242.5 Member Data Documentation

#### 10.242.5.1 AbstractSyntax

```
std::string gdcm::PresentationContext::AbstractSyntax [protected]
```

Referenced by [operator==\(\)](#).

#### 10.242.5.2 ID

```
uint8_t gdcm::PresentationContext::ID [protected]
```

#### 10.242.5.3 TransferSyntaxes

```
std::vector<std::string> gdcm::PresentationContext::TransferSyntaxes [protected]
```

Referenced by [operator==\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmPresentationContext.h](#)

## 10.243 gdcm::network::PresentationContextAC Class Reference

[PresentationContextAC](#).

```
#include <gdcmPresentationContextAC.h>
```

### Public Member Functions

- [PresentationContextAC](#) ()
- uint8\_t [GetPresentationContextID](#) () const
- uint8\_t [GetReason](#) () const
- [TransferSyntaxSub](#) const & [GetTransferSyntax](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetPresentationContextID](#) (uint8\_t id)
- void [SetReason](#) (uint8\_t r)
- void [SetTransferSyntax](#) ([TransferSyntaxSub](#) const &ts)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.243.1 Detailed Description

[PresentationContextAC](#).

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See also

[PresentationContext](#)

### 10.243.2 Constructor & Destructor Documentation

#### 10.243.2.1 PresentationContextAC()

```
gdcm::network::PresentationContextAC::PresentationContextAC ( )
```

### 10.243.3 Member Function Documentation



### 10.243.3.1 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationContextAC::GetPresentationContextID ( ) const [inline]
```

### 10.243.3.2 GetReason()

```
uint8_t gdcm::network::PresentationContextAC::GetReason ( ) const [inline]
```

### 10.243.3.3 GetTransferSyntax()

```
TransferSyntaxSub const & gdcm::network::PresentationContextAC::GetTransferSyntax ( ) const [inline]
```

### 10.243.3.4 Print()

```
void gdcm::network::PresentationContextAC::Print (
    std::ostream & os ) const
```

### 10.243.3.5 Read()

```
std::istream & gdcm::network::PresentationContextAC::Read (
    std::istream & is )
```

### 10.243.3.6 SetPresentationContextID()

```
void gdcm::network::PresentationContextAC::SetPresentationContextID (
    uint8_t id )
```

### 10.243.3.7 SetReason()

```
void gdcm::network::PresentationContextAC::SetReason (
    uint8_t r ) [inline]
```

### 10.243.3.8 SetTransferSyntax()

```
void gdcmm::network::PresentationContextAC::SetTransferSyntax (
    TransferSyntaxSub const & ts )
```

### 10.243.3.9 Size()

```
size_t gdcmm::network::PresentationContextAC::Size ( ) const
```

### 10.243.3.10 Write()

```
const std::ostream & gdcmm::network::PresentationContextAC::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmmPresentationContextAC.h](#)

## 10.244 gdcmm::PresentationContextGenerator Class Reference

[PresentationContextGenerator](#).

```
#include <gdcmmPresentationContextGenerator.h>
```

### Public Types

- typedef std::vector< [PresentationContext](#) > [PresentationContextArrayType](#)
- typedef [PresentationContextArrayType](#)::size\_type [SizeType](#)

### Public Member Functions

- [PresentationContextGenerator](#) ()
- bool [AddFromFile](#) (const [File](#) &file)
- bool [GenerateFromFilenames](#) (const [Directory::FilenamesType](#) &files)
- bool [GenerateFromUID](#) ([UIDs::TSName](#) asname)
 

*Generate the [PresentationContext](#) array from a UID (eg. [VerificationSOPClass](#))*
- [PresentationContextArrayType](#) const & [GetPresentationContexts](#) ()
- void [SetDefaultTransferSyntax](#) (const [TransferSyntax](#) &ts)
 

*Not implemented for now. GDCM internally uses Implicit Little Endian.*
- void [SetMergeModeToAbstractSyntax](#) ()
- void [SetMergeModeToTransferSyntax](#) ()

## Protected Member Functions

- bool [AddPresentationContext](#) (const char \*absyn, const char \*ts)
- const char \* [GetDefaultTransferSyntax](#) () const

### 10.244.1 Detailed Description

[PresentationContextGenerator](#).

This class is responsible for generating the proper [PresentationContext](#) that will be used in subsequent operation during a DICOM Query/Retrieve association. The step of the association is very sensible as special care need to be taken to explicitly define what instance are going to be send and how they are encoded.

For example a [PresentationContext](#) will express that negotiation requires that CT [Image](#) Storage are send using JPEG Lossless, while US [Image](#) Storage are sent using RLE Transfer Syntax.

Two very different API are exposed one which will always default to little endian transfer syntax see [GenerateFromUID\(\)](#) This API is used for C-ECHO, C-FIND and C-MOVE (SCU). Another API: [GenerateFromFilenames\(\)](#) is used for C-↔STORE (SCU) as it will loop over all filenames argument to detect the actual encoding. and therefore find the proper encoding to be used.

Two modes are available. The default mode (SetMergeModeToAbstractSyntax) append [PresentationContext](#) (one AbstractSyntax and one [TransferSyntax](#)), as long as they are different. Eg MR [Image](#) Storage/JPEG2000 and MR [Image](#) Storage/JPEGLossless would be considered different. the other mode SetMergeModeToTransferSyntax merge any new [TransferSyntax](#) to the already existing [PresentationContext](#) in order to re-use the same AbstractSyntax.

See also

[PresentationContext](#)

Examples

[CStoreQtProgress.cxx](#).

### 10.244.2 Member Typedef Documentation

#### 10.244.2.1 PresentationContextArrayType

```
typedef std::vector<PresentationContext> gdcm::PresentationContextGenerator::PresentationContextArrayType
```

#### 10.244.2.2 SizeType

```
typedef PresentationContextArrayType::size\_type gdcm::PresentationContextGenerator::SizeType
```

### 10.244.3 Constructor & Destructor Documentation

#### 10.244.3.1 PresentationContextGenerator()

```
gdcm::PresentationContextGenerator::PresentationContextGenerator ( )
```

### 10.244.4 Member Function Documentation

#### 10.244.4.1 AddFromFile()

```
bool gdcm::PresentationContextGenerator::AddFromFile (
    const File & file )
```

Add a single [PresentationContext](#) from a single [File](#). Call multiple times when dealing with multiple files.

#### 10.244.4.2 AddPresentationContext()

```
bool gdcm::PresentationContextGenerator::AddPresentationContext (
    const char * absyn,
    const char * ts ) [protected]
```

#### 10.244.4.3 GenerateFromFileNames()

```
bool gdcm::PresentationContextGenerator::GenerateFromFileNames (
    const Directory::FilenameType & files )
```

Generate the [PresentationContext](#) array from a File-Set. [File](#) specified needs to be valid DICOM files. Used for C↔STORE operations

#### Examples

[CStoreQtProgress.cxx](#).

#### 10.244.4.4 GenerateFromUID()

```
bool gdcmm::PresentationContextGenerator::GenerateFromUID (
    UIDs::TSName asname )
```

Generate the [PresentationContext](#) array from a UID (eg. VerificationSOPClass)

#### 10.244.4.5 GetDefaultTransferSyntax()

```
const char * gdcmm::PresentationContextGenerator::GetDefaultTransferSyntax ( ) const [protected]
```

#### 10.244.4.6 GetPresentationContexts()

```
PresentationContextArrayType const & gdcmm::PresentationContextGenerator::GetPresentationContexts (
) [inline]
```

#### Examples

[CStoreQtProgress.cxx](#).

#### 10.244.4.7 SetDefaultTransferSyntax()

```
void gdcmm::PresentationContextGenerator::SetDefaultTransferSyntax (
    const TransferSyntax & ts )
```

Not implemented for now. GDCM internally uses Implicit Little Endian.

#### 10.244.4.8 SetMergeModeToAbstractSyntax()

```
void gdcmm::PresentationContextGenerator::SetMergeModeToAbstractSyntax ( )
```

#### 10.244.4.9 SetMergeModeToTransferSyntax()

```
void gdcmm::PresentationContextGenerator::SetMergeModeToTransferSyntax ( )
```

The documentation for this class was generated from the following file:

- [gdcmmPresentationContextGenerator.h](#)

### 10.245 gdcmm::network::PresentationContextRQ Class Reference

[PresentationContextRQ.](#)

```
#include <gdcmmPresentationContextRQ.h>
```

#### Public Types

- typedef std::vector< [TransferSyntaxSub](#) >::size\_type [SizeType](#)

#### Public Member Functions

- [PresentationContextRQ](#) ()
- [PresentationContextRQ](#) (const [PresentationContext](#) &pc)
- [PresentationContextRQ](#) (UIDs::TSName asname, UIDs::TSName tsname=UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM)
- void [AddTransferSyntax](#) ([TransferSyntaxSub](#) const &ts)
- [AbstractSyntax](#) & [GetAbstractSyntax](#) ()
- [AbstractSyntax](#) const & [GetAbstractSyntax](#) () const
- [SizeType](#) [GetNumberOfTransferSyntaxes](#) () const
- uint8\_t [GetPresentationContextID](#) () const
- [TransferSyntaxSub](#) & [GetTransferSyntax](#) ([SizeType](#) i)
- [TransferSyntaxSub](#) const & [GetTransferSyntax](#) ([SizeType](#) i) const
- std::vector< [TransferSyntaxSub](#) > const & [GetTransferSyntaxes](#) () const
- bool [operator==](#) (const [PresentationContextRQ](#) &pc) const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetAbstractSyntax](#) ([AbstractSyntax](#) const &absyn)
- void [SetPresentationContextID](#) (uint8\_t id)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

#### 10.245.1 Detailed Description

[PresentationContextRQ.](#)

Table 9-13 PRESENTATION CONTEXT ITEM FIELDS

See also

[PresentationContextAC](#)

## 10.245.2 Member Typedef Documentation

### 10.245.2.1 SizeType

```
typedef std::vector<TransferSyntaxSub>::size_type gdcm::network::PresentationContextRQ::SizeType
```

## 10.245.3 Constructor & Destructor Documentation

### 10.245.3.1 PresentationContextRQ() [1/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ ( )
```

### 10.245.3.2 PresentationContextRQ() [2/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ (
    UIDs::TSName asname,
    UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM )
```

Initialize Presentation Context with [AbstractSyntax](#) set to asname and with a single [TransferSyntax](#) set to tsname (default to Implicit [VR](#) LittleEndian when not specified ).

### 10.245.3.3 PresentationContextRQ() [3/3]

```
gdcm::network::PresentationContextRQ::PresentationContextRQ (
    const PresentationContext & pc )
```

## 10.245.4 Member Function Documentation

### 10.245.4.1 AddTransferSyntax()

```
void gdcm::network::PresentationContextRQ::AddTransferSyntax (
    TransferSyntaxSub const & ts )
```

#### 10.245.4.2 GetAbstractSyntax() [1/2]

```
AbstractSyntax & gdcm::network::PresentationContextRQ::GetAbstractSyntax ( ) [inline]
```

#### 10.245.4.3 GetAbstractSyntax() [2/2]

```
AbstractSyntax const & gdcm::network::PresentationContextRQ::GetAbstractSyntax ( ) const [inline]
```

#### 10.245.4.4 GetNumberOfTransferSyntaxes()

```
SizeType gdcm::network::PresentationContextRQ::GetNumberOfTransferSyntaxes ( ) const [inline]
```

#### 10.245.4.5 GetPresentationContextID()

```
uint8_t gdcm::network::PresentationContextRQ::GetPresentationContextID ( ) const
```

#### 10.245.4.6 GetTransferSyntax() [1/2]

```
TransferSyntaxSub & gdcm::network::PresentationContextRQ::GetTransferSyntax (
    SizeType i ) [inline]
```

#### 10.245.4.7 GetTransferSyntax() [2/2]

```
TransferSyntaxSub const & gdcm::network::PresentationContextRQ::GetTransferSyntax (
    SizeType i ) const [inline]
```

#### 10.245.4.8 GetTransferSyntaxes()

```
std::vector< TransferSyntaxSub > const & gdcm::network::PresentationContextRQ::GetTransfer←
Syntaxes ( ) const [inline]
```



#### 10.245.4.9 operator==(

```
bool gdcm::network::PresentationContextRQ::operator== (
    const PresentationContextRQ & pc ) const [inline]
```

#### 10.245.4.10 Print()

```
void gdcm::network::PresentationContextRQ::Print (
    std::ostream & os ) const
```

#### 10.245.4.11 Read()

```
std::istream & gdcm::network::PresentationContextRQ::Read (
    std::istream & is )
```

#### 10.245.4.12 SetAbstractSyntax()

```
void gdcm::network::PresentationContextRQ::SetAbstractSyntax (
    AbstractSyntax const & absyn )
```

#### 10.245.4.13 SetPresentationContextID()

```
void gdcm::network::PresentationContextRQ::SetPresentationContextID (
    uint8_t id )
```

#### 10.245.4.14 Size()

```
size_t gdcm::network::PresentationContextRQ::Size ( ) const
```

#### 10.245.4.15 Write()

```
const std::ostream & gdcmm::network::PresentationContextRQ::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmmPresentationContextRQ.h](#)

## 10.246 gdcmm::network::PresentationDataValue Class Reference

[PresentationDataValue.](#)

```
#include <gdcmmPresentationDataValue.h>
```

### Public Member Functions

- [PresentationDataValue](#) ()
- const std::string & [GetBlob](#) () const
- bool [GetIsCommand](#) () const
- bool [GetIsLastFragment](#) () const
- uint8\_t [GetMessageHeader](#) () const
- uint8\_t [GetPresentationContextID](#) () const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- std::istream & [ReadInto](#) (std::istream &is, std::ostream &os)
- void [SetBlob](#) (const std::string &partialblob)
- void [SetCommand](#) (bool inCommand)
- void [SetDataSet](#) (const [DataSet](#) &ds)
- void [SetLastFragment](#) (bool inLast)
- void [SetMessageHeader](#) (uint8\_t messageheader)
- void [SetPresentationContextID](#) (uint8\_t id)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### Static Public Member Functions

- static [DataSet](#) [ConcatenatePDVBlobs](#) (const std::vector< [PresentationDataValue](#) > &inPDVs)
- static [DataSet](#) [ConcatenatePDVBlobsAsExplicit](#) (const std::vector< [PresentationDataValue](#) > &inPDVs)

#### 10.246.1 Detailed Description

[PresentationDataValue.](#)

[Table](#) 9-23 PRESENTATION-DATA-VALUE ITEM FIELDS

## 10.246.2 Constructor & Destructor Documentation

### 10.246.2.1 PresentationDataValue()

```
gdcm::network::PresentationDataValue::PresentationDataValue ( )
```

## 10.246.3 Member Function Documentation

### 10.246.3.1 ConcatenatePDVBlobs()

```
static DataSet gdcm::network::PresentationDataValue::ConcatenatePDVBlobs (
    const std::vector< PresentationDataValue > & inPDVs ) [static]
```

#### Warning

[DataSet](#) will be read as Implicit Little Endian TS

### 10.246.3.2 ConcatenatePDVBlobsAsExplicit()

```
static DataSet gdcm::network::PresentationDataValue::ConcatenatePDVBlobsAsExplicit (
    const std::vector< PresentationDataValue > & inPDVs ) [static]
```

### 10.246.3.3 GetBlob()

```
const std::string & gdcm::network::PresentationDataValue::GetBlob ( ) const
```

### 10.246.3.4 GetIsCommand()

```
bool gdcm::network::PresentationDataValue::GetIsCommand ( ) const
```

**10.246.3.5 GetIsLastFragment()**

```
bool gdcmm::network::PresentationDataValue::GetIsLastFragment ( ) const
```

**10.246.3.6 GetMessageHeader()**

```
uint8_t gdcmm::network::PresentationDataValue::GetMessageHeader ( ) const [inline]
```

**10.246.3.7 GetPresentationContextID()**

```
uint8_t gdcmm::network::PresentationDataValue::GetPresentationContextID ( ) const [inline]
```

**10.246.3.8 Print()**

```
void gdcmm::network::PresentationDataValue::Print (
    std::ostream & os ) const
```

**10.246.3.9 Read()**

```
std::istream & gdcmm::network::PresentationDataValue::Read (
    std::istream & is )
```

**10.246.3.10 ReadInto()**

```
std::istream & gdcmm::network::PresentationDataValue::ReadInto (
    std::istream & is,
    std::ostream & os )
```

**10.246.3.11 SetBlob()**

```
void gdcmm::network::PresentationDataValue::SetBlob (
    const std::string & partialblob )
```

### 10.246.3.12 SetCommand()

```
void gdcm::network::PresentationDataValue::SetCommand (
    bool inCommand )
```

### 10.246.3.13 SetDataSet()

```
void gdcm::network::PresentationDataValue::SetDataSet (
    const DataSet & ds )
```

Set DataSet. Write DataSet in implicit.

#### Warning

size of dataset should be below maxpdusize

### 10.246.3.14 SetLastFragment()

```
void gdcm::network::PresentationDataValue::SetLastFragment (
    bool inLast )
```

### 10.246.3.15 SetMessageHeader()

```
void gdcm::network::PresentationDataValue::SetMessageHeader (
    uint8_t messageheader ) [inline]
```

### 10.246.3.16 SetPresentationContextID()

```
void gdcm::network::PresentationDataValue::SetPresentationContextID (
    uint8_t id ) [inline]
```

### 10.246.3.17 Size()

```
size_t gdcm::network::PresentationDataValue::Size ( ) const
```

### 10.246.3.18 Write()

```
const std::ostream & gdcM::network::PresentationDataValue::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcMPresentationDataValue.h](#)

## 10.247 gdcM::Printer Class Reference

[Printer](#) class.

```
#include <gdcMPrinter.h>
```

Inheritance diagram for gdcM::Printer:

Collaboration diagram for gdcM::Printer:

### Public Types

- enum [PrintStyles](#) {  
[VERBOSE\\_STYLE](#) = 0 ,  
[CONDENSED\\_STYLE](#) ,  
[XML](#) ,  
[CXX](#) }

### Public Member Functions

- [Printer](#) ()
- [~Printer](#) ()
- [PrintStyles](#) [GetPrintStyle](#) () const  
*Get PrintStyle value.*
- void [Print](#) (std::ostream &os)  
*Print.*
- void [PrintDataSet](#) (const [DataSet](#) &ds, std::ostream &os, const std::string &s="")  
*Print an individual dataset.*
- void [SetColor](#) (bool c)  
*Set color mode or not.*
- void [SetFile](#) ([File](#) const &f)  
*Set file.*
- void [SetStyle](#) ([PrintStyles](#) ps)  
*Set PrintStyle value.*

## Protected Member Functions

- [VR PrintDataElement](#) (std::ostream &os, const [Dicts](#) &dicts, const [DataSet](#) &ds, const [DataElement](#) &de, std::ostream &out, std::string const &indent)
- void [PrintSQ](#) (const [SequenceOfItems](#) \*sqi, std::ostream &os, std::string const &indent)

## Protected Attributes

- const [File](#) \* F
- [VL MaxPrintLength](#)
- [PrintStyles](#) [PrintStyle](#)

### 10.247.1 Detailed Description

[Printer](#) class.

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), and [DumpToshibaDTI2.cxx](#).

### 10.247.2 Member Enumeration Documentation

#### 10.247.2.1 PrintStyles

enum [gdcm::Printer::PrintStyles](#)

#### Enumerator

VERBOSE_STYLE	
CONDENSED_STYLE	
XML	
CXX	

### 10.247.3 Constructor & Destructor Documentation

#### 10.247.3.1 Printer()

```
gdcm::Printer::Printer ( )
```

### 10.247.3.2 ~Printer()

```
gdcm::Printer::~~Printer ( )
```

## 10.247.4 Member Function Documentation

### 10.247.4.1 GetPrintStyle()

```
PrintStyle gdcm::Printer::GetPrintStyle ( ) const [inline]
```

Get PrintStyle value.

### 10.247.4.2 Print()

```
void gdcm::Printer::Print (
    std::ostream & os )
```

Print.

#### Examples

[DumpSiemensBase64.cxx](#).

### 10.247.4.3 PrintDataElement()

```
VR gdcm::Printer::PrintDataElement (
    std::ostringstream & os,
    const Dicts & dicts,
    const DataSet & ds,
    const DataElement & de,
    std::ostream & out,
    std::string const & indent ) [protected]
```



#### 10.247.4.4 PrintDataSet()

```
void gdcm::Printer::PrintDataSet (
    const DataSet & ds,
    std::ostream & os,
    const std::string & s = "" )
```

Print an individual dataset.

#### 10.247.4.5 PrintSQ()

```
void gdcm::Printer::PrintSQ (
    const SequenceOfItems * sqi,
    std::ostream & os,
    std::string const & indent ) [protected]
```

#### 10.247.4.6 SetColor()

```
void gdcm::Printer::SetColor (
    bool c )
```

Set color mode or not.

#### 10.247.4.7 SetFile()

```
void gdcm::Printer::SetFile (
    File const & f ) [inline]
```

Set file.

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), and [DumpToshibaDTI2.cxx](#).

#### 10.247.4.8 SetStyle()

```
void gdcm::Printer::SetStyle (
    PrintStyles ps ) [inline]
```

Set PrintStyle value.

## 10.247.5 Member Data Documentation

### 10.247.5.1 F

```
const File* gdcm::Printer::F [protected]
```

### 10.247.5.2 MaxPrintLength

```
VL gdcm::Printer::MaxPrintLength [protected]
```

### 10.247.5.3 PrintStyle

```
PrintStyles gdcm::Printer::PrintStyle [protected]
```

The documentation for this class was generated from the following file:

- [gdcmPrinter.h](#)

## 10.248 gdcm::PrivateDict Class Reference

Private [Dict](#).

```
#include <gdcmDict.h>
```

### Public Member Functions

- [PrivateDict](#) ()=default
- [~PrivateDict](#) ()=default
- void [AddDictEntry](#) (const [PrivateTag](#) &tag, const [DictEntry](#) &de)
- bool [FindDictEntry](#) (const [PrivateTag](#) &tag) const
- const [DictEntry](#) & [GetDictEntry](#) (const [PrivateTag](#) &tag) const
- bool [IsEmpty](#) () const
- void [PrintXML](#) () const
- bool [RemoveDictEntry](#) (const [PrivateTag](#) &tag)

## Protected Member Functions

- void [LoadDefault](#) ()

## Friends

- class [Dicts](#)
- std::ostream & [operator<<](#) (std::ostream &os, const [PrivateDict](#) &val)

### 10.248.1 Detailed Description

Private [Dict](#).

### 10.248.2 Constructor & Destructor Documentation

#### 10.248.2.1 PrivateDict()

```
gdcm::PrivateDict::PrivateDict ( ) [default]
```

#### 10.248.2.2 ~PrivateDict()

```
gdcm::PrivateDict::~~PrivateDict ( ) [default]
```

### 10.248.3 Member Function Documentation

#### 10.248.3.1 AddDictEntry()

```
void gdcm::PrivateDict::AddDictEntry (
    const PrivateTag & tag,
    const DictEntry & de ) [inline]
```

References [gdcm::DictEntry::GetVM\(\)](#), [gdcm::DictEntry::GetVR\(\)](#), [gdcm::DictEntry::SetVM\(\)](#), [gdcm::DictEntry::SetVR\(\)](#), and [gdcm::VR::UN](#).

### 10.248.3.2 FindDictEntry()

```
bool gdcm::PrivateDict::FindDictEntry (
    const PrivateTag & tag ) const [inline]
```

### 10.248.3.3 GetDictEntry()

```
const DictEntry & gdcm::PrivateDict::GetDictEntry (
    const PrivateTag & tag ) const [inline]
```

### 10.248.3.4 IsEmpty()

```
bool gdcm::PrivateDict::IsEmpty ( ) const [inline]
```

### 10.248.3.5 LoadDefault()

```
void gdcm::PrivateDict::LoadDefault ( ) [protected]
```

### 10.248.3.6 PrintXML()

```
void gdcm::PrivateDict::PrintXML ( ) const [inline]
```

References [gdcm::Tag::GetElement\(\)](#), [gdcm::Tag::GetGroup\(\)](#), [gdcm::DictEntry::GetName\(\)](#), [gdcm::PrivateTag::GetOwner\(\)](#), [gdcm::DictEntry::GetVM\(\)](#), and [gdcm::DictEntry::GetVR\(\)](#).

### 10.248.3.7 RemoveDictEntry()

```
bool gdcm::PrivateDict::RemoveDictEntry (
    const PrivateTag & tag ) [inline]
```

Remove entry 'tag'. Return true on success (element was found and remove). return false if element was not found.

## 10.248.4 Friends And Related Function Documentation

### 10.248.4.1 Dicts

```
friend class Dicts [friend]
```

### 10.248.4.2 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const PrivateDict & val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmDict.h](#)

## 10.249 gdcm::PrivateTag Class Reference

Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#), Owner)

```
#include <gdcmPrivateTag.h>
```

Inheritance diagram for gdcm::PrivateTag:

Collaboration diagram for gdcm::PrivateTag:

### Public Member Functions

- [PrivateTag](#) ([Tag](#) const &t, const char \*owner="")
- [PrivateTag](#) (uint16\_t group=0, uint16\_t element=0, const char \*owner="")
- [DataElement GetAsDataElement](#) () const
- const char \* [GetOwner](#) () const
- bool [operator!=](#) (const [PrivateTag](#) &\_val) const
- bool [operator!=](#) (const [Tag](#) &\_val) const
- bool [operator<](#) (const [PrivateTag](#) &\_val) const
- [PrivateTag](#) & [operator=](#) (const [PrivateTag](#) &\_val)
- bool [operator==](#) (const [PrivateTag](#) &\_val) const
- bool [operator==](#) (const [Tag](#) &\_val) const
- bool [ReadFromCommaSeparatedString](#) (const char \*str)
- void [SetOwner](#) (const char \*owner)

## Friends

- `std::ostream & operator<< (std::ostream &_os, const PrivateTag &_val)`

### 10.249.1 Detailed Description

Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#), Owner)

#### Note

private tag have element value in: [0x10,0xff], for instance 0x0009,0x0000 is NOT a private tag

#### Examples

[ChangePrivateTags.cxx](#), [Cleaner.cs](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [ELSCINT1WaveToText.cxx](#), [FileStreaming.cs](#), [GetSubSequenceData.cxx](#), [MrProtocol.cxx](#), [PublicDict.cxx](#), [ReadGEMSSDO.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.249.2 Constructor & Destructor Documentation

#### 10.249.2.1 [PrivateTag\(\)](#) [1/2]

```
gdcm::PrivateTag::PrivateTag (
    uint16_t group = 0,
    uint16_t element = 0,
    const char * owner = "" ) [inline]
```

#### 10.249.2.2 [PrivateTag\(\)](#) [2/2]

```
gdcm::PrivateTag::PrivateTag (
    Tag const & t,
    const char * owner = "" ) [inline]
```

References [gdcm::Tag::GetElement\(\)](#).

### 10.249.3 Member Function Documentation

### 10.249.3.1 GetAsDataElement()

```
DataElement gdcm::PrivateTag::GetAsDataElement ( ) const
```

### 10.249.3.2 GetOwner()

```
const char * gdcm::PrivateTag::GetOwner ( ) const [inline]
```

#### Examples

[PublicDict.cxx](#).

Referenced by [gdcm::PrivateDict::PrintXML\(\)](#).

### 10.249.3.3 operator"!="() [1/2]

```
bool gdcm::PrivateTag::operator!= (
    const PrivateTag & _val ) const [inline]
```

References [gdcm::Tag::GetElementTag\(\)](#).

### 10.249.3.4 operator"!="() [2/2]

```
bool gdcm::PrivateTag::operator!= (
    const Tag & _val ) const [inline]
```

References [gdcm::Tag::GetElementTag\(\)](#).

### 10.249.3.5 operator<()

```
bool gdcm::PrivateTag::operator< (
    const PrivateTag & _val ) const
```

### 10.249.3.6 operator=()

```
PrivateTag & gdcm::PrivateTag::operator= (
    const PrivateTag & _val ) [inline]
```

References [gdcm::Tag::GetElementTag\(\)](#).

### 10.249.3.7 operator==( ) [1/2]

```
bool gdcm::PrivateTag::operator== (
    const PrivateTag & _val ) const [inline]
```

References [gdcm::Tag::GetElementTag\(\)](#).

### 10.249.3.8 operator==( ) [2/2]

```
bool gdcm::PrivateTag::operator== (
    const Tag & _val ) const [inline]
```

References [gdcm::Tag::GetElementTag\(\)](#).

### 10.249.3.9 ReadFromCommaSeparatedString()

```
bool gdcm::PrivateTag::ReadFromCommaSeparatedString (
    const char * str )
```

Read [PrivateTag](#) from a string. [Element](#) number will be truncated to 8bits. Eg: "1234,5678,GDCM" is private tag: (1234,78,"GDCM")

### 10.249.3.10 SetOwner()

```
void gdcm::PrivateTag::SetOwner (
    const char * owner ) [inline]
```

## 10.249.4 Friends And Related Function Documentation



#### 10.249.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const PrivateTag & _val ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmPrivateTag.h](#)

## 10.250 gdcm::ProgressEvent Class Reference

[ProgressEvent](#).

```
#include <gdcmProgressEvent.h>
```

Inheritance diagram for gdcm::ProgressEvent:

Collaboration diagram for gdcm::ProgressEvent:

### Public Types

- typedef [ProgressEvent Self](#)
- typedef [AnyEvent Superclass](#)

### Public Member Functions

- [ProgressEvent](#) (const [Self](#) &s)
- [ProgressEvent](#) (double p=0)
- [~ProgressEvent](#) () override=default
- bool [CheckEvent](#) (const [::gdcm::Event](#) \*e) const override
- const char \* [GetEventName](#) () const override
- double [GetProgress](#) () const
- [::gdcm::Event](#) \* [MakeObject](#) () const override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetProgress](#) (double p)

### 10.250.1 Detailed Description

[ProgressEvent](#).

Special type of event triggered during

See also

[AnyEvent](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

## 10.250.2 Member Typedef Documentation

### 10.250.2.1 Self

```
typedef ProgressEvent gdcm::ProgressEvent::Self
```

### 10.250.2.2 Superclass

```
typedef AnyEvent gdcm::ProgressEvent::Superclass
```

## 10.250.3 Constructor & Destructor Documentation

### 10.250.3.1 ProgressEvent() [1/2]

```
gdcm::ProgressEvent::ProgressEvent (
    double p = 0 ) [inline]
```

### 10.250.3.2 ~ProgressEvent()

```
gdcm::ProgressEvent::~~ProgressEvent ( ) [override], [default]
```

### 10.250.3.3 ProgressEvent() [2/2]

```
gdcm::ProgressEvent::ProgressEvent (
    const Self & s ) [inline]
```

## 10.250.4 Member Function Documentation

#### 10.250.4.1 CheckEvent()

```
bool gdcm::ProgressEvent::CheckEvent (
    const ::gdcm::Event * e ) const [inline], [override]
```

#### 10.250.4.2 GetEventName()

```
const char * gdcm::ProgressEvent::GetEventName ( ) const [inline], [override], [virtual]
```

Return the StringName associated with the event.

Implements [gdcm::Event](#).

#### 10.250.4.3 GetProgress()

```
double gdcm::ProgressEvent::GetProgress ( ) const [inline]
```

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

#### 10.250.4.4 MakeObject()

```
::gdcm::Event * gdcm::ProgressEvent::MakeObject ( ) const [inline], [override], [virtual]
```

Create an [Event](#) of this type This method work as a Factory for creating events of each particular type.

Implements [gdcm::Event](#).

#### 10.250.4.5 operator=()

```
void gdcm::ProgressEvent::operator= (
    const Self & ) [delete]
```

#### 10.250.4.6 SetProgress()

```
void gdcmm::ProgressEvent::SetProgress (
    double p ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmmProgressEvent.h](#)

## 10.251 gdcmm::PVRGCodec Class Reference

[PVRGCodec](#).

```
#include <gdcmmPVRGCodec.h>
```

Inheritance diagram for gdcmm::PVRGCodec:

Collaboration diagram for gdcmm::PVRGCodec:

### Public Member Functions

- [PVRGCodec](#) ()
- [~PVRGCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- void [SetLossyFlag](#) (bool l)

### Additional Inherited Members

#### 10.251.1 Detailed Description

[PVRGCodec](#).

##### Note

pvr is a broken implementation of the JPEG standard. It is known to have a bug in the 16bits lossless implementation of the standard.

In an ideal world, you should not need this codec at all. But to support some broken file such as:

PHILIPS\_Gyrosan-12-Jpeg\_Extended\_Process\_2\_4.dcm

we have to...

## 10.251.2 Constructor & Destructor Documentation

### 10.251.2.1 PVRGCodec()

```
gdcm::PVRGCodec::PVRGCodec ( )
```

### 10.251.2.2 ~PVRGCodec()

```
gdcm::PVRGCodec::~~PVRGCodec ( ) [override]
```

## 10.251.3 Member Function Documentation

### 10.251.3.1 CanCode()

```
bool gdcm::PVRGCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.251.3.2 CanDecode()

```
bool gdcm::PVRGCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.251.3.3 Clone()

```
ImageCodec * gdcM::PVRGCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcM::ImageCodec](#).

### 10.251.3.4 Code()

```
bool gdcM::PVRGCodec::Code (
    DataElement const & in_,
    DataElement & out_ ) [override], [virtual]
```

Code.

Reimplemented from [gdcM::Coder](#).

### 10.251.3.5 Decode()

```
bool gdcM::PVRGCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcM::ImageCodec](#).

### 10.251.3.6 SetLossyFlag()

```
void gdcM::PVRGCodec::SetLossyFlag (
    bool l )
```

The documentation for this class was generated from the following file:

- [gdcMPVRGCodec.h](#)

## 10.252 gdcM::PythonFilter Class Reference

[PythonFilter](#) [PythonFilter](#) is the class that make gdcM2.x looks more like gdcM1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.

```
#include <gdcMPythonFilter.h>
```

## Public Member Functions

- [PythonFilter](#) ()
- [~PythonFilter](#) ()
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- void [SetDicts](#) (const [Dicts](#) &dicts)
- void [SetFile](#) (const [File](#) &f)
- PyObject \* [ToPyObject](#) (const [Tag](#) &t) const
- void [UseDictAlways](#) (bool)

### 10.252.1 Detailed Description

[PythonFilter](#) [PythonFilter](#) is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.

### 10.252.2 Constructor & Destructor Documentation

#### 10.252.2.1 PythonFilter()

```
gdcm::PythonFilter::PythonFilter ( )
```

#### 10.252.2.2 ~PythonFilter()

```
gdcm::PythonFilter::~~PythonFilter ( )
```

### 10.252.3 Member Function Documentation

#### 10.252.3.1 GetFile() [1/2]

```
File & gdcm::PythonFilter::GetFile ( )
```

### 10.252.3.2 GetFile() [2/2]

```
const File & gdcM::PythonFilter::GetFile ( ) const
```

### 10.252.3.3 SetDicts()

```
void gdcM::PythonFilter::SetDicts (
    const Dicts & dicts )
```

### 10.252.3.4 SetFile()

```
void gdcM::PythonFilter::SetFile (
    const File & f )
```

### 10.252.3.5 ToPyObject()

```
PyObject * gdcM::PythonFilter::ToPyObject (
    const Tag & t ) const
```

### 10.252.3.6 UseDictAlways()

```
void gdcM::PythonFilter::UseDictAlways (
    bool ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcMPythonFilter.h](#)

## 10.253 gdcM::QueryBase Class Reference

[QueryBase](#).

```
#include <gdcMQueryBase.h>
```

Inheritance diagram for gdcM::QueryBase:



## Public Member Functions

- virtual [~QueryBase](#) ()=default
- std::vector< [Tag](#) > [GetAllRequiredTags](#) (const [ERootType](#) &inRootType) const
- std::vector< [Tag](#) > [GetAllTags](#) (const [ERootType](#) &inRootType) const
- virtual std::vector< [Tag](#) > [GetHierarchicalSearchTags](#) (const [ERootType](#) &inRootType) const =0  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- virtual const char \* [GetName](#) () const =0
- virtual std::vector< [Tag](#) > [GetOptionalTags](#) (const [ERootType](#) &inRootType) const =0
- virtual [DataElement](#) [GetQueryLevel](#) () const =0
- virtual std::vector< [Tag](#) > [GetRequiredTags](#) (const [ERootType](#) &inRootType) const =0
- virtual std::vector< [Tag](#) > [GetUniqueTags](#) (const [ERootType](#) &inRootType) const =0

### 10.253.1 Detailed Description

[QueryBase](#).

contains: the base class for constructing a query dataset for a C-FIND and a C-MOVE

There are four levels of C-FIND and C-MOVE query:

- [Patient](#)
- [Study](#)
- [Series](#)
- [Image](#)

Each one has its own required and optional tags. This class provides an interface for getting those tags. This is an interface class.

See 3.4 C 6.1 and 3.4 C 6.2 for the patient and study root query types. These sections define the tags allowed by a particular query. The caller must pass in which root type they want, patient or study. A third root type, Modality Worklist Query, isn't yet supported.

This class (or rather it's derived classes) will be held in the RootQuery types. These query types actually make the dataset, and will use this dataset to list the required, unique, and optional tags for each type of query. This design is somewhat overly complicated, but is kept so that if we ever wanted to try to guess the query type from the given tags, we could do so.

### 10.253.2 Constructor & Destructor Documentation

#### 10.253.2.1 ~QueryBase()

```
virtual gdcmm::QueryBase::~QueryBase ( ) [virtual], [default]
```

### 10.253.3 Member Function Documentation

#### 10.253.3.1 GetAllRequiredTags()

```
std::vector< Tag > gdcM::QueryBase::GetAllRequiredTags (
    const ERootType & inRootType ) const
```

In order to validate a query dataset we need to check that there exists at least one required (or unique) key

#### 10.253.3.2 GetAllTags()

```
std::vector< Tag > gdcM::QueryBase::GetAllTags (
    const ERootType & inRootType ) const
```

In order to validate a query dataset, just check for the presence of a tag, not it's requirement level in the spec

#### 10.253.3.3 GetHierachicalSearchTags()

```
virtual std::vector< Tag > gdcM::QueryBase::GetHierachicalSearchTags (
    const ERootType & inRootType ) const [pure virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implemented in [gdcM::QueryImage](#), [gdcM::QueryPatient](#), [gdcM::QuerySeries](#), and [gdcM::QueryStudy](#).

#### 10.253.3.4 GetName()

```
virtual const char * gdcM::QueryBase::GetName ( ) const [pure virtual]
```

Implemented in [gdcM::QueryImage](#), [gdcM::QueryPatient](#), [gdcM::QuerySeries](#), and [gdcM::QueryStudy](#).

#### 10.253.3.5 GetOptionalTags()

```
virtual std::vector< Tag > gdcM::QueryBase::GetOptionalTags (
    const ERootType & inRootType ) const [pure virtual]
```

Implemented in [gdcM::QueryImage](#), [gdcM::QueryPatient](#), [gdcM::QuerySeries](#), and [gdcM::QueryStudy](#).

### 10.253.3.6 GetQueryLevel()

```
virtual DataElement gdcm::QueryBase::GetQueryLevel ( ) const [pure virtual]
```

Implemented in [gdcm::QueryImage](#), [gdcm::QueryPatient](#), [gdcm::QuerySeries](#), and [gdcm::QueryStudy](#).

### 10.253.3.7 GetRequiredTags()

```
virtual std::vector< Tag > gdcm::QueryBase::GetRequiredTags (
    const ERootType & inRootType ) const [pure virtual]
```

Implemented in [gdcm::QueryImage](#), [gdcm::QueryPatient](#), [gdcm::QuerySeries](#), and [gdcm::QueryStudy](#).

### 10.253.3.8 GetUniqueTags()

```
virtual std::vector< Tag > gdcm::QueryBase::GetUniqueTags (
    const ERootType & inRootType ) const [pure virtual]
```

Implemented in [gdcm::QueryImage](#), [gdcm::QueryPatient](#), [gdcm::QuerySeries](#), and [gdcm::QueryStudy](#).

The documentation for this class was generated from the following file:

- [gdcmQueryBase.h](#)

## 10.254 gdcm::QueryFactory Class Reference

QueryFactory.h.

```
#include <gdcmQueryFactory.h>
```

### Static Public Member Functions

- static [ECharSet](#) [GetCharacterFromCurrentLocale](#) ()
- static void [ListCharSets](#) (std::ostream &os)  
*List all possible CharSet.*
- static [DataElement](#) [ProduceCharacterSetDataElement](#) (const std::vector< [ECharSet](#) > &inCharSetType)
- static [BaseQuery](#) \* [ProduceQuery](#) (const std::string &sopInstanceUID, [ENQueryType](#) inQueryType)
- static [BaseRootQuery](#) \* [ProduceQuery](#) ([ERootType](#) inRootType, [EQueryType](#) inQueryType, [EQueryLevel](#) inQueryLevel)

### 10.254.1 Detailed Description

QueryFactory.h.

#### Note

contains: a class to produce a query based off of user-entered information

Essentially, this class is used to construct a query based off of user input (typically from the command line; if in code directly, the query itself could just be instantiated)

In theory, could also be used as the interface to validate incoming datasets as belonging to a particular query style

### 10.254.2 Member Function Documentation

#### 10.254.2.1 GetCharacterFromCurrentLocale()

```
static ECharSet gdcm::QueryFactory::GetCharacterFromCurrentLocale ( ) [static]
```

This function will return the corresponding ECharSet associated with the current locale of the running system (based on the value of locale() ).

#### 10.254.2.2 ListCharSets()

```
static void gdcm::QueryFactory::ListCharSets (
    std::ostream & os ) [static]
```

List all possible CharSet.

#### 10.254.2.3 ProduceCharacterSetDataElement()

```
static DataElement gdcm::QueryFactory::ProduceCharacterSetDataElement (
    const std::vector< ECharSet > & inCharSetType ) [static]
```

This function will produce the appropriate dataelement given a list of charsets. The first charset will be used directly, while the second and subsequent will be prepended with "ISO2022 ". Redundant character sets are not permitted, so if they are encountered, they will just be skipped. if UTF8 or GB18030 is used, no subsequent character sets will be used if the vector passed in is empty, then the dataelement that's passed out will be empty and Latin1 is the presumed encoding

**10.254.2.4 ProduceQuery() [1/2]**

```
static BaseQuery * gdcm::QueryFactory::ProduceQuery (
    const std::string & sopInstanceUID,
    ENQueryType inQueryType ) [static]
```

**10.254.2.5 ProduceQuery() [2/2]**

```
static BaseRootQuery * gdcm::QueryFactory::ProduceQuery (
    ERootType inRootType,
    EQueryType inQueryType,
    EQueryLevel inQueryLevel ) [static]
```

this function will produce a query (basically, a wrapper to a dataset that can validate whether or not the query is a valid cfind/cmove query) and the level of the query (patient, study, series, image). If the user provides an invalid instantiation (ie, study root type, query level of patient), then the result is NULL.

The documentation for this class was generated from the following file:

- [gdcmQueryFactory.h](#)

**10.255 gdcm::QueryImage Class Reference**

[QueryImage](#).

```
#include <gdcmQueryImage.h>
```

Inheritance diagram for gdcm::QueryImage:

Collaboration diagram for gdcm::QueryImage:

**Public Member Functions**

- std::vector< [Tag](#) > [GetHierarchicalSearchTags](#) (const [ERootType](#) &inRootType) const override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- const char \* [GetName](#) () const override
- std::vector< [Tag](#) > [GetOptionalTags](#) (const [ERootType](#) &inRootType) const override
- [DataElement](#) [GetQueryLevel](#) () const override
- std::vector< [Tag](#) > [GetRequiredTags](#) (const [ERootType](#) &inRootType) const override
- std::vector< [Tag](#) > [GetUniqueTags](#) (const [ERootType](#) &inRootType) const override

### 10.255.1 Detailed Description

[QueryImage](#).

contains: class to construct an image-based query for C-FIND and C-MOVE

### 10.255.2 Member Function Documentation

#### 10.255.2.1 GetHierarchicalSearchTags()

```
std::vector< Tag > gdcM::QueryImage::GetHierarchicalSearchTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcM::QueryBase](#).

#### 10.255.2.2 GetName()

```
const char * gdcM::QueryImage::GetName ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

#### 10.255.2.3 GetOptionalTags()

```
std::vector< Tag > gdcM::QueryImage::GetOptionalTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

#### 10.255.2.4 GetQueryLevel()

```
DataElement gdcM::QueryImage::GetQueryLevel ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.255.2.5 GetRequiredTags()

```
std::vector< Tag > gdcm::QueryImage::GetRequiredTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

### 10.255.2.6 GetUniqueTags()

```
std::vector< Tag > gdcm::QueryImage::GetUniqueTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

The documentation for this class was generated from the following file:

- [gdcmQueryImage.h](#)

## 10.256 gdcm::QueryPatient Class Reference

[QueryPatient](#).

```
#include <gdcmQueryPatient.h>
```

Inheritance diagram for [gdcm::QueryPatient](#):

Collaboration diagram for [gdcm::QueryPatient](#):

### Public Member Functions

- `std::vector< Tag > GetHierachicalSearchTags (const ERootType &inRootType) const` override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- `const char * GetName ()` const override
- `std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const` override
- `DataElement GetQueryLevel ()` const override
- `std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const` override
- `std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const` override

### 10.256.1 Detailed Description

[QueryPatient](#).

contains: class to construct a patient-based query for c-find and c-move

## 10.256.2 Member Function Documentation

### 10.256.2.1 GetHierachicalSearchTags()

```
std::vector< Tag > gdcM::QueryPatient::GetHierachicalSearchTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcM::QueryBase](#).

### 10.256.2.2 GetName()

```
const char * gdcM::QueryPatient::GetName ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.256.2.3 GetOptionalTags()

```
std::vector< Tag > gdcM::QueryPatient::GetOptionalTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.256.2.4 GetQueryLevel()

```
DataElement gdcM::QueryPatient::GetQueryLevel ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.256.2.5 GetRequiredTags()

```
std::vector< Tag > gdcM::QueryPatient::GetRequiredTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).



### 10.256.2.6 GetUniqueTags()

```
std::vector< Tag > gdcm::QueryPatient::GetUniqueTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

The documentation for this class was generated from the following file:

- [gdcmQueryPatient.h](#)

## 10.257 gdcm::QuerySeries Class Reference

[QuerySeries](#).

```
#include <gdcmQuerySeries.h>
```

Inheritance diagram for [gdcm::QuerySeries](#):

Collaboration diagram for [gdcm::QuerySeries](#):

### Public Member Functions

- `std::vector< Tag > GetHierarchicalSearchTags (const ERootType &inRootType) const override`  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- `const char * GetName () const override`
- `std::vector< Tag > GetOptionalTags (const ERootType &inRootType) const override`
- `DataElement GetQueryLevel () const override`
- `std::vector< Tag > GetRequiredTags (const ERootType &inRootType) const override`
- `std::vector< Tag > GetUniqueTags (const ERootType &inRootType) const override`

### 10.257.1 Detailed Description

[QuerySeries](#).

contains: class to construct a series-based query for c-find and c-move

### 10.257.2 Member Function Documentation

### 10.257.2.1 GetHierarchicalSearchTags()

```
std::vector< Tag > gdcM::QuerySeries::GetHierarchicalSearchTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcM::QueryBase](#).

### 10.257.2.2 GetName()

```
const char * gdcM::QuerySeries::GetName ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.257.2.3 GetOptionalTags()

```
std::vector< Tag > gdcM::QuerySeries::GetOptionalTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.257.2.4 GetQueryLevel()

```
DataElement gdcM::QuerySeries::GetQueryLevel ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.257.2.5 GetRequiredTags()

```
std::vector< Tag > gdcM::QuerySeries::GetRequiredTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.257.2.6 GetUniqueTags()

```
std::vector< Tag > gdcm::QuerySeries::GetUniqueTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

The documentation for this class was generated from the following file:

- [gdcmQuerySeries.h](#)

## 10.258 gdcm::QueryStudy Class Reference

QueryStudy.h.

```
#include <gdcmQueryStudy.h>
```

Inheritance diagram for gdcm::QueryStudy:

Collaboration diagram for gdcm::QueryStudy:

### Public Member Functions

- std::vector< [Tag](#) > [GetHierarchicalSearchTags](#) (const [ERootType](#) &inRootType) const override  
*Return all Unique Key for a particular Query Root type (from the same level and above).*
- const char \* [GetName](#) () const override
- std::vector< [Tag](#) > [GetOptionalTags](#) (const [ERootType](#) &inRootType) const override
- [DataElement](#) [GetQueryLevel](#) () const override
- std::vector< [Tag](#) > [GetRequiredTags](#) (const [ERootType](#) &inRootType) const override
- std::vector< [Tag](#) > [GetUniqueTags](#) (const [ERootType](#) &inRootType) const override

### 10.258.1 Detailed Description

QueryStudy.h.

contains: class to construct a study-based query for C-FIND and C-MOVE

### 10.258.2 Member Function Documentation

#### 10.258.2.1 GetHierachicalSearchTags()

```
std::vector< Tag > gdcM::QueryStudy::GetHierachicalSearchTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Return all Unique Key for a particular Query Root type (from the same level and above).

Implements [gdcM::QueryBase](#).

#### 10.258.2.2 GetName()

```
const char * gdcM::QueryStudy::GetName ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

#### 10.258.2.3 GetOptionalTags()

```
std::vector< Tag > gdcM::QueryStudy::GetOptionalTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

#### 10.258.2.4 GetQueryLevel()

```
DataElement gdcM::QueryStudy::GetQueryLevel ( ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

#### 10.258.2.5 GetRequiredTags()

```
std::vector< Tag > gdcM::QueryStudy::GetRequiredTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcM::QueryBase](#).

### 10.258.2.6 GetUniqueTags()

```
std::vector< Tag > gdcm::QueryStudy::GetUniqueTags (
    const ERootType & inRootType ) const [override], [virtual]
```

Implements [gdcm::QueryBase](#).

The documentation for this class was generated from the following file:

- [gdcmQueryStudy.h](#)

## 10.259 gdcm::RAWCodec Class Reference

[RAWCodec](#) class.

```
#include <gdcmRAWCodec.h>
```

Inheritance diagram for [gdcm::RAWCodec](#):

Collaboration diagram for [gdcm::RAWCodec](#):

### Public Member Functions

- [RAWCodec](#) ()
- [~RAWCodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- bool [DecodeBytes](#) (const char \*inBytes, size\_t inBufferLength, char \*outBytes, size\_t inOutBufferLength)
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override

### Protected Member Functions

- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override

### Additional Inherited Members

#### 10.259.1 Detailed Description

[RAWCodec](#) class.

## 10.259.2 Constructor & Destructor Documentation

### 10.259.2.1 RAWCodec()

```
gdcm::RAWCodec::RAWCodec ( )
```

### 10.259.2.2 ~RAWCodec()

```
gdcm::RAWCodec::~~RAWCodec ( ) [override]
```

## 10.259.3 Member Function Documentation

### 10.259.3.1 CanCode()

```
bool gdcm::RAWCodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.259.3.2 CanDecode()

```
bool gdcm::RAWCodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.259.3.3 Clone()

```
ImageCodec * gdcm::RAWCodec::Clone ( ) const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

### 10.259.3.4 Code()

```
bool gdcm::RAWCodec::Code (
    DataElement const & in_,
    DataElement & out_ ) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 10.259.3.5 Decode()

```
bool gdcm::RAWCodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 10.259.3.6 DecodeByStreams()

```
bool gdcm::RAWCodec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.259.3.7 DecodeBytes()

```
bool gdcm::RAWCodec::DecodeBytes (
    const char * inBytes,
    size_t inBufferLength,
    char * outBytes,
    size_t inOutBufferLength )
```

Used by the ImageStreamReader– converts a read in buffer into one with the proper encodings.

### 10.259.3.8 GetHeaderInfo()

```
bool gdcmm::RAWCodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcmm::ImageCodec](#).

The documentation for this class was generated from the following file:

- [gdcmmRAWCodec.h](#)

## 10.260 gdcmm::Reader Class Reference

[Reader](#) ala DOM (Document [Object](#) Model)

```
#include <gdcmmReader.h>
```

Inheritance diagram for [gdcmm::Reader](#):

Collaboration diagram for [gdcmm::Reader](#):

### Public Member Functions

- [Reader](#) ()
- virtual [~Reader](#) ()
- bool [CanRead](#) () const
- [File](#) & [GetFile](#) ()
  - Set/Get File.*
- const [File](#) & [GetFile](#) () const
  - Set/Get File.*
- size\_t [GetStreamCurrentPosition](#) () const
- virtual bool [Read](#) ()
  - Main function to read a file.*
- bool [ReadSelectedPrivateTags](#) (std::set< [PrivateTag](#) > const &ptags, bool readvalues=true)
  - Will only read the specified selected private tags.*
- bool [ReadSelectedTags](#) (std::set< [Tag](#) > const &tags, bool readvalues=true)
  - Will only read the specified selected tags.*
- bool [ReadUpToTag](#) (const [Tag](#) &tag, std::set< [Tag](#) > const &skiptags=std::set< [Tag](#) >())
- void [SetFile](#) ([File](#) &file)
  - Set/Get File.*
- void [SetFileName](#) (const char \*filename\_native)
- void [SetStream](#) (std::istream &input\_stream)
  - Set the open-ed stream directly.*



## Protected Member Functions

- `std::istream *` [GetStreamPtr](#) () const
- `bool` [ReadDataSet](#) ()
- `bool` [ReadMetaInformation](#) ()
- `bool` [ReadPreamble](#) ()

## Protected Attributes

- `SmartPointer< File >` [F](#)

## Friends

- `class` [StreamImageReader](#)

### 10.260.1 Detailed Description

[Reader](#) ala DOM (Document [Object](#) Model)

This class is a non-validating reader, it will only performs well- formedness check only, and to some extent catch known error (non well-formed document).

Detailed description here

A [DataSet](#) DOES NOT contains group 0x0002 (see [FileMetaInformation](#))

This is really a [DataSet](#) reader. This will not make sure the dataset conform to any [IOD](#) at all. This is a completely different step. The reasoning was that user could control the [IOD](#) there lib would handle and thus we would not be able to read a [DataSet](#) if the [IOD](#) was not found Instead we separate the reading from the validation.

#### Note

From GDCM1.x. Users will realize that one feature is missing from this DOM implementation. In GDCM 1.x user used to be able to control the size of the [Value](#) to be read. By default it was 0xffff. The main author of GDCM2 thought this was too dangerous and harmful and therefore this feature did not make it into GDCM2

#### Warning

GDCM will not produce warning for unordered (non-alphabetical order).

#### See also

[Writer](#) [FileMetaInformation](#) [DataSet](#) [File](#)

#### Examples

[BasicAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [FixBrokenJ2K.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReadUTF8QtDir.cxx](#), [ReformatFile.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 10.260.2 Constructor & Destructor Documentation

### 10.260.2.1 Reader()

```
gdcm::Reader::Reader ( )
```

### 10.260.2.2 ~Reader()

```
virtual gdcm::Reader::~Reader ( ) [virtual]
```

## 10.260.3 Member Function Documentation

### 10.260.3.1 CanRead()

```
bool gdcm::Reader::CanRead ( ) const
```

Test whether this is a DICOM file

#### Warning

need to call either SetFileName or SetStream first

#### Examples

[ReadUTF8QtDir.cxx](#).

### 10.260.3.2 GetFile() [1/2]

```
File & gdcm::Reader::GetFile ( ) [inline]
```

Set/Get [File](#).

### 10.260.3.3 GetFile() [2/2]

```
const File & gdcm::Reader::GetFile ( ) const [inline]
```

Set/Get [File](#).

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReformatFile.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [StandardizeFiles.cs](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.260.3.4 GetStreamCurrentPosition()

```
size_t gdcm::Reader::GetStreamCurrentPosition ( ) const
```

For wrapped language. return type is compatible with [System::FileSize](#) return type Use native std::streampos / std::streamoff directly from the stream from C++

#### Examples

[ExtractImageRegion.cs](#).

### 10.260.3.5 GetStreamPtr()

```
std::istream * gdcm::Reader::GetStreamPtr ( ) const [inline], [protected]
```

### 10.260.3.6 Read()

```
virtual bool gdcm::Reader::Read ( ) [virtual]
```

Main function to read a file.

Reimplemented in [gdcm::ImageReader](#), [gdcm::ImageRegionReader](#), [gdcm::PixmapReader](#), [gdcm::SegmentReader](#), and [gdcm::SurfaceReader](#).

#### Examples

[BasicAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [FixBrokenJ2K.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReformatFile.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.260.3.7 ReadDataSet()

```
bool gdcm::Reader::ReadDataSet ( ) [protected]
```

### 10.260.3.8 ReadMetaInformation()

```
bool gdcm::Reader::ReadMetaInformation ( ) [protected]
```

### 10.260.3.9 ReadPreamble()

```
bool gdcm::Reader::ReadPreamble ( ) [protected]
```

### 10.260.3.10 ReadSelectedPrivateTags()

```
bool gdcm::Reader::ReadSelectedPrivateTags (
    std::set< PrivateTag > const & ptags,
    bool readvalues = true )
```

Will only read the specified selected private tags.

### 10.260.3.11 ReadSelectedTags()

```
bool gdcm::Reader::ReadSelectedTags (
    std::set< Tag > const & tags,
    bool readvalues = true )
```

Will only read the specified selected tags.

### 10.260.3.12 ReadUpToTag()

```
bool gdcm::Reader::ReadUpToTag (
    const Tag & tag,
    std::set< Tag > const & skiptags = std::set< Tag >() )
```

Will read only up to [Tag](#)

#### Parameters

<i>tag</i>	and skipping any tag specified in
<i>skiptags</i>	

#### Examples

[DumpVisusChange.cxx](#).

### 10.260.3.13 SetFile()

```
void gdcm::Reader::SetFile (
    File & file ) [inline]
```

Set/Get [File](#).

### 10.260.3.14 SetFileName()

```
void gdcmm::Reader::SetFileName (
    const char * filename_native )
```

Set the filename to open. This will create a `std::ifstream` internally See `SetStream` if you are dealing with different `std::istream` object

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [CheckBigEndianBug.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [ConvertToQImage.cxx](#), [CreateFakeRTDOSE.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DiffFile.cxx](#), [DumpADAC.cxx](#), [DumpCSA.cs](#), [DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpImageHeaderInfo.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [ELSCINT1WaveToText.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [ExtractIconFromFile.cxx](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetArray.cs](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MrProtocol.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [PrintLUT.cxx](#), [QIDO-RS.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ReadGEMSSDO.cxx](#), [ReadMultiTimesException.cxx](#), [ReadUTF8QtDir.cxx](#), [ReformatFile.cs](#), [RescaleImage.cs](#), [SimplePrint.cs](#), [SimplePrintPatientName.cs](#), [StandardizeFiles.cs](#), [TemplateEmptyImage.cxx](#), [TestReader.cxx](#), [csa2img.cxx](#), [gdcmmrtionplan.cxx](#), [gdcmmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), [rle2img.cxx](#), and [threadgdcmm.cxx](#).

### 10.260.3.15 SetStream()

```
void gdcmm::Reader::SetStream (
    std::istream & input_stream ) [inline]
```

Set the open-ed stream directly.

#### Examples

[ReadUTF8QtDir.cxx](#).

## 10.260.4 Friends And Related Function Documentation

### 10.260.4.1 StreamImageReader

```
friend class StreamImageReader [friend]
```

## 10.260.5 Member Data Documentation

### 10.260.5.1 F

```
SmartPointer<File> gdcm::Reader::F [protected]
```

The documentation for this class was generated from the following file:

- [gdcmReader.h](#)

## 10.261 gdcm::RealWorldValueMappingContent Struct Reference

```
#include <gdcmImageHelper.h>
```

Collaboration diagram for gdcm::RealWorldValueMappingContent:

### Public Attributes

- std::string [CodeMeaning](#)
- std::string [CodeValue](#)
- double [RealWorldValueIntercept](#)
- double [RealWorldValueSlope](#)

## 10.261.1 Member Data Documentation

### 10.261.1.1 CodeMeaning

```
std::string gdcm::RealWorldValueMappingContent::CodeMeaning
```

### 10.261.1.2 CodeValue

```
std::string gdcm::RealWorldValueMappingContent::CodeValue
```

### 10.261.1.3 RealWorldValueIntercept

```
double gdcmm::RealWorldValueMappingContent::RealWorldValueIntercept
```

### 10.261.1.4 RealWorldValueSlope

```
double gdcmm::RealWorldValueMappingContent::RealWorldValueSlope
```

The documentation for this struct was generated from the following file:

- [gdcmlImageHelper.h](#)

## 10.262 gdcmm::Region Class Reference

Class for manipulation region.

```
#include <gdcmmRegion.h>
```

Inheritance diagram for gdcmm::Region:

### Public Member Functions

- [Region](#) ()
- virtual [~Region](#) ()
- virtual size\_t [Area](#) () const =0  
*compute the area*
- virtual [Region](#) \* [Clone](#) () const =0
- virtual [BoxRegion](#) [ComputeBoundingBox](#) ()=0  
*Return the Axis-Aligned minimum bounding box for all regions.*
- virtual bool [Empty](#) () const =0  
*return whether this domain is empty:*
- virtual bool [IsValid](#) () const =0  
*return whether this is valid domain*
- virtual void [Print](#) (std::ostream &os=std::cout) const  
*Print.*

### 10.262.1 Detailed Description

Class for manipulation region.



## 10.262.2 Constructor & Destructor Documentation

### 10.262.2.1 Region()

```
gdcm::Region::Region ( )
```

### 10.262.2.2 ~Region()

```
virtual gdcm::Region::~~Region ( ) [virtual]
```

## 10.262.3 Member Function Documentation

### 10.262.3.1 Area()

```
virtual size_t gdcm::Region::Area ( ) const [pure virtual]
```

compute the area

Implemented in [gdcm::BoxRegion](#).

### 10.262.3.2 Clone()

```
virtual Region * gdcm::Region::Clone ( ) const [pure virtual]
```

Implemented in [gdcm::BoxRegion](#).

### 10.262.3.3 ComputeBoundingBox()

```
virtual BoxRegion gdcm::Region::ComputeBoundingBox ( ) [pure virtual]
```

Return the Axis-Aligned minimum bounding box for all regions.

Implemented in [gdcm::BoxRegion](#).

#### 10.262.3.4 Empty()

```
virtual bool gdcm::Region::Empty ( ) const [pure virtual]
```

return whether this domain is empty:

Implemented in [gdcm::BoxRegion](#).

#### 10.262.3.5 IsValid()

```
virtual bool gdcm::Region::IsValid ( ) const [pure virtual]
```

return whether this is valid domain

Implemented in [gdcm::BoxRegion](#).

#### 10.262.3.6 Print()

```
virtual void gdcm::Region::Print (
    std::ostream & os = std::cout ) const [virtual]
```

Print.

Reimplemented in [gdcm::BoxRegion](#).

Referenced by [gdcm::operator<<\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmRegion.h](#)

## 10.263 gdcm::Rescaler Class Reference

Rescale class.

```
#include <gdcmRescaler.h>
```

## Public Member Functions

- [Rescaler](#) ()
- [~Rescaler](#) ()=default
- [PixelFormat::ScalarType ComputeInterceptSlopePixelFormat](#) ()
- [PixelFormat ComputePixelFormatFromMinMax](#) ()
- double [GetIntercept](#) () const
- double [GetSlope](#) () const
- bool [InverseRescale](#) (char \*out, const char \*in, size\_t n)  
*Inverse transform.*
- bool [Rescale](#) (char \*out, const char \*in, size\_t n)  
*Direct transform.*
- void [SetIntercept](#) (double i)  
*Set Intercept: used for both direct&inverse transformation.*
- void [SetMinMaxForPixelFormat](#) (double min, double max)
- void [SetPixelFormat](#) ([PixelFormat](#) const &pf)  
*Set Pixel Format of input data.*
- void [SetSlope](#) (double s)  
*Set Slope: user for both direct&inverse transformation.*
- void [SetTargetPixelFormat](#) ([PixelFormat](#) const &targetst)
- void [SetUseTargetPixelFormat](#) (bool b)  
*Override default behavior of Rescale.*

## Protected Member Functions

- template<typename TIn >  
void [InverseRescaleFunctionIntoBestFit](#) (char \*out, const TIn \*in, size\_t n)
- template<typename TIn >  
void [RescaleFunctionIntoBestFit](#) (char \*out, const TIn \*in, size\_t n)

### 10.263.1 Detailed Description

Rescale class.

This class is meant to apply the linear transform of Stored Pixel [Value](#) to Real World [Value](#). This is mostly found in CT or PET dataset, where the value are stored using one type, but need to be converted to another scale using a linear transform. There are basically two cases: In CT: the linear transform is generally integer based. E.g. the Stored Pixel [Type](#) is unsigned short 12bits, but to get Hounsfield unit, one need to apply the linear transform:

$$RWV = 1. * SV - 1024$$

So the best scalar to store the Real World [Value](#) will be 16 bits signed type.

In PET: the linear transform is generally floating point based. Since the dynamic range can be quite high, the Rescale Slope / Rescale Intercept can be changing throughout the [Series](#). So it is important to read all linear transform and deduce the best Pixel [Type](#) only at the end (when all the images to be read have been parsed).

### Warning

Internally any time a floating point value is found either in the Rescale Slope or the Rescale Intercept it is assumed that the best matching output pixel type is FLOAT64 (in previous implementation it was FLOAT32). Because [VR:DS](#) is closer to a 64bits floating point type FLOAT64 is thus a best matching pixel type for the floating point transformation.

Example: Let say input is FLOAT64, and we want UINT16 as output, we would do:

```
Rescaler ir;  
ir.SetIntercept( 0 );  
ir.SetSlope( 5.6789 );  
ir.SetPixelFormat( FLOAT64 );  
ir.SetMinMaxForPixelType( ((PixelFormat)UINT16).GetMin(), ((PixelFormat)UINT16).GetMax() );  
ir.InverseRescale(output,input,numberofbytes );
```

### Note

handle floating point transformation back and forth to integer properly (no loss)

### See also

[Unpacker12Bits](#)

### Examples

[RescaleImage.cs](#).

## 10.263.2 Constructor & Destructor Documentation

### 10.263.2.1 Rescaler()

```
gdcm::Rescaler::Rescaler ( ) [inline]
```

### 10.263.2.2 ~Rescaler()

```
gdcm::Rescaler::~~Rescaler ( ) [default]
```

## 10.263.3 Member Function Documentation

### 10.263.3.1 ComputeInterceptSlopePixelType()

```
PixelFormat::ScalarType gdcm::Rescaler::ComputeInterceptSlopePixelType ( )
```

Compute the Pixel Format of the output data Used for direct transformation

#### Examples

[RescaleImage.cs](#).

### 10.263.3.2 ComputePixelTypeFromMinMax()

```
PixelFormat gdcm::Rescaler::ComputePixelTypeFromMinMax ( )
```

Compute the Pixel Format of the output data Used for inverse transformation

### 10.263.3.3 GetIntercept()

```
double gdcm::Rescaler::GetIntercept ( ) const [inline]
```

### 10.263.3.4 GetSlope()

```
double gdcm::Rescaler::GetSlope ( ) const [inline]
```

### 10.263.3.5 InverseRescale()

```
bool gdcm::Rescaler::InverseRescale (
    char * out,
    const char * in,
    size_t n )
```

Inverse transform.

### 10.263.3.6 InverseRescaleFunctionIntoBestFit()

```
template<typename TIn >
void gdcm::Rescaler::InverseRescaleFunctionIntoBestFit (
    char * out,
    const TIn * in,
    size_t n ) [protected]
```

### 10.263.3.7 Rescale()

```
bool gdcm::Rescaler::Rescale (
    char * out,
    const char * in,
    size_t n )
```

Direct transform.

#### Examples

[RescaleImage.cs](#).

### 10.263.3.8 RescaleFunctionIntoBestFit()

```
template<typename TIn >
void gdcm::Rescaler::RescaleFunctionIntoBestFit (
    char * out,
    const TIn * in,
    size_t n ) [protected]
```

### 10.263.3.9 SetIntercept()

```
void gdcm::Rescaler::SetIntercept (
    double i ) [inline]
```

Set Intercept: used for both direct&inverse transformation.

#### Examples

[RescaleImage.cs](#).

### 10.263.3.10 SetMinMaxForPixelType()

```
void gdcm::Rescaler::SetMinMaxForPixelType (
    double min,
    double max )
```

Set target interval for output data. A best match will be computed (if possible) Used for inverse transformation

### 10.263.3.11 SetPixelFormat()

```
void gdcm::Rescaler::SetPixelFormat (
    PixelFormat const & pf ) [inline]
```

Set Pixel Format of input data.

#### Examples

[RescaleImage.cs](#).

### 10.263.3.12 SetSlope()

```
void gdcm::Rescaler::SetSlope (
    double s ) [inline]
```

Set Slope: user for both direct&inverse transformation.

#### Examples

[RescaleImage.cs](#).

### 10.263.3.13 SetTargetPixelType()

```
void gdcm::Rescaler::SetTargetPixelType (
    PixelFormat const & targetst )
```

By default (when UseTargetPixelType is false), a best matching Target Pixel [Type](#) is computed. However user can override this auto selection by switching UseTargetPixelType:true and also specifying the specific Target Pixel [Type](#)

### 10.263.3.14 SetUseTargetPixelFormat()

```
void gdcM::Rescaler::SetUseTargetPixelFormat (
    bool b )
```

Override default behavior of Rescale.

The documentation for this class was generated from the following file:

- [gdcMRescaler.h](#)

## 10.264 gdcM::RLECodec Class Reference

Class to do RLE.

```
#include <gdcMRLECodec.h>
```

Inheritance diagram for gdcM::RLECodec:

Collaboration diagram for gdcM::RLECodec:

### Public Member Functions

- [RLECodec](#) ()
- [~RLECodec](#) () override
- bool [CanCode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this coder support this transfer syntax (can code it)*
- bool [CanDecode](#) ([TransferSyntax](#) const &ts) const override  
*Return whether this decoder support this transfer syntax (can decode it)*
- [ImageCodec](#) \* [Clone](#) () const override
- bool [Code](#) ([DataElement](#) const &in, [DataElement](#) &out) override  
*Code.*
- bool [Decode](#) ([DataElement](#) const &is, [DataElement](#) &os) override  
*Decode.*
- unsigned long [GetBufferLength](#) () const
- bool [GetHeaderInfo](#) (std::istream &is, [TransferSyntax](#) &ts) override
- void [SetBufferLength](#) (unsigned long l)
- void [SetLength](#) (unsigned long l)

### Protected Member Functions

- bool [AppendFrameEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [AppendRowEncode](#) (std::ostream &out, const char \*data, size\_t datalen) override
- bool [DecodeByStreams](#) (std::istream &is, std::ostream &os) override
- bool [DecodeExtent](#) (char \*buffer, unsigned int XMin, unsigned int XMax, unsigned int YMin, unsigned int YMax, unsigned int ZMin, unsigned int ZMax, std::istream &is)
- bool [IsFrameEncoder](#) () override
- bool [IsRowEncoder](#) () override
- bool [StartEncode](#) (std::ostream &) override
- bool [StopEncode](#) (std::ostream &) override



## Friends

- class [ImageRegionReader](#)

## Additional Inherited Members

### 10.264.1 Detailed Description

Class to do RLE.

#### Note

ANSI X3.9 A.4.2 RLE Compression Annex G defines a RLE Compression Transfer Syntax. This transfer Syntax is identified by the UID value "1.2.840.10008.1.2.5". If the object allows multi-frame images in the pixel data field, then each frame shall be encoded separately. Each frame shall be encoded in one and only one [Fragment](#) (see PS 3.5.8.2).

### 10.264.2 Constructor & Destructor Documentation

#### 10.264.2.1 RLECodec()

```
gdcm::RLECodec::RLECodec ( )
```

#### 10.264.2.2 ~RLECodec()

```
gdcm::RLECodec::~~RLECodec ( ) [override]
```

### 10.264.3 Member Function Documentation

#### 10.264.3.1 AppendFrameEncode()

```
bool gdcm::RLECodec::AppendFrameEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.264.3.2 AppendRowEncode()

```
bool gdcm::RLECodec::AppendRowEncode (
    std::ostream & out,
    const char * data,
    size_t datalen ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.264.3.3 CanCode()

```
bool gdcm::RLECodec::CanCode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this coder support this transfer syntax (can code it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.264.3.4 CanDecode()

```
bool gdcm::RLECodec::CanDecode (
    TransferSyntax const & ) const [override], [virtual]
```

Return whether this decoder support this transfer syntax (can decode it)

Reimplemented from [gdcm::ImageCodec](#).

### 10.264.3.5 Clone()

```
ImageCodec * gdcm::RLECodec::Clone ( ) const [override], [virtual]
```

Implements [gdcm::ImageCodec](#).

### 10.264.3.6 Code()

```
bool gdcm::RLECodec::Code (
    DataElement const & in_,
    DataElement & out_ ) [override], [virtual]
```

Code.

Reimplemented from [gdcm::Coder](#).

### 10.264.3.7 Decode()

```
bool gdcm::RLECodec::Decode (
    DataElement const & ,
    DataElement & ) [override], [virtual]
```

Decode.

Reimplemented from [gdcm::ImageCodec](#).

### 10.264.3.8 DecodeByStreams()

```
bool gdcm::RLECodec::DecodeByStreams (
    std::istream & is,
    std::ostream & os ) [override], [protected], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

### 10.264.3.9 DecodeExtent()

```
bool gdcm::RLECodec::DecodeExtent (
    char * buffer,
    unsigned int XMin,
    unsigned int XMax,
    unsigned int YMin,
    unsigned int YMax,
    unsigned int ZMin,
    unsigned int ZMax,
    std::istream & is ) [protected]
```

### 10.264.3.10 GetBufferLength()

```
unsigned long gdcm::RLECodec::GetBufferLength ( ) const [inline]
```

### 10.264.3.11 GetHeaderInfo()

```
bool gdcm::RLECodec::GetHeaderInfo (
    std::istream & is,
    TransferSyntax & ts ) [override], [virtual]
```

Reimplemented from [gdcm::ImageCodec](#).

#### 10.264.3.12 IsFrameEncoder()

```
bool gdcM::RLECodec::IsFrameEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

#### 10.264.3.13 IsRowEncoder()

```
bool gdcM::RLECodec::IsRowEncoder ( ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

#### 10.264.3.14 SetBufferLength()

```
void gdcM::RLECodec::SetBufferLength (
    unsigned long l ) [inline]
```

#### 10.264.3.15 SetLength()

```
void gdcM::RLECodec::SetLength (
    unsigned long l ) [inline]
```

#### 10.264.3.16 StartEncode()

```
bool gdcM::RLECodec::StartEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

#### 10.264.3.17 StopEncode()

```
bool gdcM::RLECodec::StopEncode (
    std::ostream & ) [override], [protected], [virtual]
```

Reimplemented from [gdcM::ImageCodec](#).

## 10.264.4 Friends And Related Function Documentation

### 10.264.4.1 ImageRegionReader

```
friend class ImageRegionReader [friend]
```

The documentation for this class was generated from the following file:

- [gdcmRLECodec.h](#)

## 10.265 gdcm::network::RoleSelectionSub Class Reference

[RoleSelectionSub](#).

```
#include <gdcmRoleSelectionSub.h>
```

### Public Member Functions

- [RoleSelectionSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetTuple](#) (const char \*uid, uint8\_t scurole, uint8\_t scprole)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.265.1 Detailed Description

[RoleSelectionSub](#).

PS 3.7 [Table D.3-9](#) SCP/SCU ROLE SELECTION SUB-ITEM FIELDS (A-ASSOCIATE-RQ)

### 10.265.2 Constructor & Destructor Documentation

#### 10.265.2.1 RoleSelectionSub()

```
gdcm::network::RoleSelectionSub::RoleSelectionSub ( )
```

### 10.265.3 Member Function Documentation

#### 10.265.3.1 Print()

```
void gdcM::network::RoleSelectionSub::Print (
    std::ostream & os ) const
```

#### 10.265.3.2 Read()

```
std::istream & gdcM::network::RoleSelectionSub::Read (
    std::istream & is )
```

#### 10.265.3.3 SetTuple()

```
void gdcM::network::RoleSelectionSub::SetTuple (
    const char * uid,
    uint8_t scurole,
    uint8_t scprole )
```

#### 10.265.3.4 Size()

```
size_t gdcM::network::RoleSelectionSub::Size ( ) const
```

#### 10.265.3.5 Write()

```
const std::ostream & gdcM::network::RoleSelectionSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcMRoleSelectionSub.h](#)

## 10.266 gdcm::Scanner Class Reference

[Scanner](#).

```
#include <gdcmScanner.h>
```

Inheritance diagram for gdcm::Scanner:

Collaboration diagram for gdcm::Scanner:

### Classes

- struct [ltstr](#)

### Public Types

- typedef MappingType::const\_iterator [ConstIterator](#)
- typedef std::map< const char \*, [TagToValue](#), [ltstr](#) > [MappingType](#)
- typedef std::map< [Tag](#), const char \* > [TagToValue](#)
- typedef TagToValue::value\_type [TagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

### Public Member Functions

- [Scanner](#) ()
- [~Scanner](#) () override
- void [AddPrivateTag](#) ([PrivateTag](#) const &t)
- void [AddSkipTag](#) ([Tag](#) const &t)
 

*Add a tag that will need to be skipped. Those are root level skip tags.*
- void [AddTag](#) ([Tag](#) const &t)
 

*Add a tag that will need to be read. Those are root level tags.*
- [ConstIterator](#) [Begin](#) () const
- void [ClearSkipTags](#) ()
- void [ClearTags](#) ()
- [ConstIterator](#) [End](#) () const
- [Directory::FilenameType](#) [GetAllFileNamesFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FilenameType](#) const & [GetFileNames](#) () const
- [Directory::FilenameType](#) [GetKeys](#) () const
- [TagToValue](#) const & [GetMapping](#) (const char \*filename) const
 

*Get the std::map mapping filenames to value for file 'filename'.*
- [TagToValue](#) const & [GetMappingFromTagToValue](#) ([Tag](#) const &t, const char \*value) const
 

*See [GetFilenameFromTagToValue\(\)](#). This is simply [GetFilenameFromTagToValue](#) followed.*
- [MappingType](#) const & [GetMappings](#) () const
 

*Mappings are the mapping from a particular tag to the map, mapping filename to value:*
- [Directory::FilenameType](#) [GetOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetValue](#) (const char \*filename, [Tag](#) const &t) const

- [ValuesType](#) const & [GetValues](#) () const  
*Get all the values found (in lexicographic order)*
- [ValuesType](#) [GetValues](#) ([Tag](#) const &t) const  
*Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override  
*Print result.*
- void [PrintTable](#) (std::ostream &os) const
- bool [Scan](#) ([Directory::FileNamesType](#) const &filenames)  
*Start the scan !*

## Static Public Member Functions

- static [SmartPointer](#)< [Scanner](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Scanner](#) &s)

## 10.266.1 Detailed Description

[Scanner](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

### Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

### Examples

[DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).



## 10.266.2 Member Typedef Documentation

### 10.266.2.1 ConstIterator

```
typedef MappingType::const_iterator gdcm::Scanner::ConstIterator
```

### 10.266.2.2 MappingType

```
typedef std::map<const char *,TagToValue, ltstr> gdcm::Scanner::MappingType
```

### 10.266.2.3 TagToValue

```
typedef std::map<Tag, const char*> gdcm::Scanner::TagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (hold in a std::vector) this avoid an extra copy of the byte array. Tag are used as Tag class since sizeof(tag) <= sizeof(pointer)

### 10.266.2.4 TagToValueValueType

```
typedef TagToValue::value_type gdcm::Scanner::TagToValueValueType
```

### 10.266.2.5 ValuesType

```
typedef std::set< std::string > gdcm::Scanner::ValuesType
```

## 10.266.3 Constructor & Destructor Documentation

### 10.266.3.1 Scanner()

```
gdcm::Scanner::Scanner ( ) [inline]
```

### 10.266.3.2 ~Scanner()

```
gdcm::Scanner::~~Scanner ( ) [override]
```

## 10.266.4 Member Function Documentation

### 10.266.4.1 AddPrivateTag()

```
void gdcm::Scanner::AddPrivateTag (
    PrivateTag const & t )
```

### 10.266.4.2 AddSkipTag()

```
void gdcm::Scanner::AddSkipTag (
    Tag const & t )
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 10.266.4.3 AddTag()

```
void gdcm::Scanner::AddTag (
    Tag const & t )
```

Add a tag that will need to be read. Those are root level tags.

#### Examples

[DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

### 10.266.4.4 Begin()

```
ConstIterator gdcm::Scanner::Begin ( ) const [inline]
```

#### 10.266.4.5 ClearSkipTags()

```
void gdcm::Scanner::ClearSkipTags ( )
```

#### 10.266.4.6 ClearTags()

```
void gdcm::Scanner::ClearTags ( )
```

#### 10.266.4.7 End()

```
ConstIterator gdcm::Scanner::End ( ) const [inline]
```

#### 10.266.4.8 GetAllFileNamesFromTagToValue()

```
Directory::FileNamesType gdcm::Scanner::GetAllFileNamesFromTagToValue (
    Tag const & t,
    const char * valueref ) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valueref'

#### 10.266.4.9 GetFilenameFromTagToValue()

```
const char * gdcm::Scanner::GetFilenameFromTagToValue (
    Tag const & t,
    const char * valueref ) const
```

Will loop over all files and return the first file where value match the reference value 'valueref'

#### 10.266.4.10 GetFileNames()

```
Directory::FileNamesType const & gdcm::Scanner::GetFileNames ( ) const [inline]
```

#### 10.266.4.11 GetKeys()

```
Directory::FileNamesType gdc::Scanner::GetKeys ( ) const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

##### Examples

[VolumeSorter.cxx](#).

#### 10.266.4.12 GetMapping()

```
TagToValue const & gdc::Scanner::GetMapping (
    const char * filename ) const
```

Get the std::map mapping filenames to value for file 'filename'.

##### Examples

[DumpToSQLITE3.cxx](#).

#### 10.266.4.13 GetMappingFromTagToValue()

```
TagToValue const & gdc::Scanner::GetMappingFromTagToValue (
    Tag const & t,
    const char * value ) const
```

See [GetFilenameFromTagToValue\(\)](#). This is simply GetFilenameFromTagToValue followed.

#### 10.266.4.14 GetMappings()

```
MappingType const & gdc::Scanner::GetMappings ( ) const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 10.266.4.15 GetOrderedValues()

```
Directory::FileNamesType gdcm::Scanner::GetOrderedValues (
    Tag const & t ) const
```

Get all the values found (in a vector) associated with [Tag 't'](#) This function is identical to [GetValues](#), but is accessible from the wrapped layer (python, C#, java)

#### 10.266.4.16 GetValue()

```
const char * gdcm::Scanner::GetValue (
    const char * filename,
    Tag const & t ) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the [GetMapping](#) function, and then reuse the [TagToValue](#) hash table.

#### Warning

[Tag 't'](#) should have been added via [AddTag\(\)](#) prior to the [Scan\(\)](#) call !

#### 10.266.4.17 GetValues() [1/2]

```
ValuesType const & gdcm::Scanner::GetValues ( ) const [inline]
```

Get all the values found (in lexicographic order)

#### Examples

[SortImage.cxx](#), and [VolumeSorter.cxx](#).

#### 10.266.4.18 GetValues() [2/2]

```
ValuesType gdcm::Scanner::GetValues (
    Tag const & t ) const
```

Get all the values found (in lexicographic order) associated with [Tag 't'](#).

#### 10.266.4.19 IsKey()

```
bool gdcM::Scanner::IsKey (
    const char * filename ) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

##### Examples

[DumpToSQLITE3.cxx](#).

#### 10.266.4.20 New()

```
static SmartPointer< Scanner > gdcM::Scanner::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

#### 10.266.4.21 Print()

```
void gdcM::Scanner::Print (
    std::ostream & os ) const [override], [virtual]
```

Print result.

Reimplemented from [gdcM::Object](#).

#### 10.266.4.22 PrintTable()

```
void gdcM::Scanner::PrintTable (
    std::ostream & os ) const
```

#### 10.266.4.23 ProcessPublicTag()

```
void gdcM::Scanner::ProcessPublicTag (
    StringFilter & sf,
    const char * filename ) [protected]
```

#### 10.266.4.24 Scan()

```
bool gdcm::Scanner::Scan (
    Directory::FileNamesType const & filenames )
```

Start the scan !

#### Examples

[DiscriminateVolume.cxx](#), [DumpToSQLITE3.cxx](#), [SortImage.cxx](#), and [VolumeSorter.cxx](#).

### 10.266.5 Friends And Related Function Documentation

#### 10.266.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Scanner & s ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmScanner.h](#)

## 10.267 gdcm::Scanner2 Class Reference

[Scanner2](#).

```
#include <gdcmScanner2.h>
```

Inheritance diagram for gdcm::Scanner2:

Collaboration diagram for gdcm::Scanner2:

### Classes

- struct [ltstr](#)

## Public Types

- typedef PrivateMappingType::const\_iterator [PrivateConstIterator](#)
- typedef std::map< const char \*, [PrivateTagToValue](#), Itstr > [PrivateMappingType](#)
- typedef std::map< [PrivateTag](#), const char \* > [PrivateTagToValue](#)
- typedef PrivateTagToValue::value\_type [PrivateTagToValueValueType](#)
- typedef PublicMappingType::const\_iterator [PublicConstIterator](#)
- typedef std::map< const char \*, [PublicTagToValue](#), Itstr > [PublicMappingType](#)
- typedef std::map< [Tag](#), const char \* > [PublicTagToValue](#)
- typedef PublicTagToValue::value\_type [PublicTagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

## Public Member Functions

- [Scanner2](#) ()
- [~Scanner2](#) () override
- bool [AddPrivateTag](#) ([PrivateTag](#) const &pt)
- bool [AddPublicTag](#) ([Tag](#) const &t)
 

*Add a tag that will need to be read. Those are root level tags.*
- bool [AddSkipTag](#) ([Tag](#) const &t)
 

*Add a tag that will need to be skipped. Those are root level skip tags.*
- [PublicConstIterator](#) [Begin](#) () const
- void [ClearPrivateTags](#) ()
- void [ClearPublicTags](#) ()
- void [ClearSkipTags](#) ()
- [PublicConstIterator](#) [End](#) () const
- [Directory::FileNamesType](#) [GetAllFileNamesFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- [Directory::FileNamesType](#) [GetAllFileNamesFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- const char \* [GetFilenameFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FileNamesType](#) const & [GetFileNames](#) () const
 

*Return the list of filenames.*
- [Directory::FileNamesType](#) [GetKeys](#) () const
- [PrivateTagToValue](#) const & [GetMappingFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*value) const
- [PublicTagToValue](#) const & [GetMappingFromPublicTagToValue](#) ([Tag](#) const &t, const char \*value) const
 

*See [GetFilenameFromTagToValue\(\)](#). This is simply [GetFilenameFromTagToValue](#) followed.*
- [PrivateTagToValue](#) const & [GetPrivateMapping](#) (const char \*filename) const
- [PrivateMappingType](#) const & [GetPrivateMappings](#) () const
- [Directory::FileNamesType](#) [GetPrivateOrderedValues](#) ([PrivateTag](#) const &pt) const
- const char \* [GetPrivateValue](#) (const char \*filename, [PrivateTag](#) const &t) const
- [ValuesType](#) [GetPrivateValues](#) ([PrivateTag](#) const &pt) const
 

*Get all the values found (in lexicographic order) associated with [PrivateTag](#) 'pt'.*
- [PublicTagToValue](#) const & [GetPublicMapping](#) (const char \*filename) const
 

*Get the std::map mapping filenames to value for file 'filename'.*
- [PublicMappingType](#) const & [GetPublicMappings](#) () const
 

*Mappings are the mapping from a particular tag to the map, mapping filename to value:*
- [Directory::FileNamesType](#) [GetPublicOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetPublicValue](#) (const char \*filename, [Tag](#) const &t) const



- [ValueType GetPublicValues](#) ([Tag](#) const &t) const  
*Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- [ValueType](#) const & [GetValues](#) () const  
*Get all the values found (in lexicographic order)*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override  
*Print result.*
- void [PrintTable](#) (std::ostream &os, bool header=false) const  
*Print result as CSV table.*
- [PrivateConstIterator PrivateBegin](#) () const
- [PrivateConstIterator PrivateEnd](#) () const
- bool [Scan](#) ([Directory::FileNamesType](#) const &filenames)  
*Start the scan !*

## Static Public Member Functions

- static [SmartPointer](#)< [Scanner2](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPrivateTag](#) ([StringFilter](#) &sf, const char \*filename)
- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Scanner2](#) &s)

### 10.267.1 Detailed Description

#### [Scanner2](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

#### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

#### Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

## 10.267.2 Member Typedef Documentation

### 10.267.2.1 PrivateConstIterator

```
typedef PrivateMappingType::const_iterator gdcm::Scanner2::PrivateConstIterator
```

### 10.267.2.2 PrivateMappingType

```
typedef std::map<const char *,PrivateTagToValue, ltstr> gdcm::Scanner2::PrivateMappingType
```

### 10.267.2.3 PrivateTagToValue

```
typedef std::map<PrivateTag, const char*> gdcm::Scanner2::PrivateTagToValue
```

### 10.267.2.4 PrivateTagToValueValueType

```
typedef PrivateTagToValue::value_type gdcm::Scanner2::PrivateTagToValueValueType
```

### 10.267.2.5 PublicConstIterator

```
typedef PublicMappingType::const_iterator gdcm::Scanner2::PublicConstIterator
```

### 10.267.2.6 PublicMappingType

```
typedef std::map<const char *,PublicTagToValue, ltstr> gdcm::Scanner2::PublicMappingType
```

### 10.267.2.7 PublicTagToValue

```
typedef std::map<Tag, const char*> gdcm::Scanner2::PublicTagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (held in a std::vector) this avoid an extra copy of the byte array. Tag are used as Tag class since sizeof(tag) <= sizeof(pointer)

### 10.267.2.8 PublicTagToValueValueType

```
typedef PublicTagToValue::value_type gdcm::Scanner2::PublicTagToValueValueType
```

### 10.267.2.9 ValuesType

```
typedef std::set< std::string > gdcm::Scanner2::ValuesType
```

## 10.267.3 Constructor & Destructor Documentation

### 10.267.3.1 Scanner2()

```
gdcm::Scanner2::Scanner2 ( ) [inline]
```

### 10.267.3.2 ~Scanner2()

```
gdcm::Scanner2::~~Scanner2 ( ) [override]
```

## 10.267.4 Member Function Documentation

### 10.267.4.1 AddPrivateTag()

```
bool gdcm::Scanner2::AddPrivateTag (
    PrivateTag const & pt )
```

#### 10.267.4.2 AddPublicTag()

```
bool gdcm::Scanner2::AddPublicTag (
    Tag const & t )
```

Add a tag that will need to be read. Those are root level tags.

#### 10.267.4.3 AddSkipTag()

```
bool gdcm::Scanner2::AddSkipTag (
    Tag const & t )
```

Add a tag that will need to be skipped. Those are root level skip tags.

#### 10.267.4.4 Begin()

```
PublicConstIterator gdcm::Scanner2::Begin ( ) const [inline]
```

#### 10.267.4.5 ClearPrivateTags()

```
void gdcm::Scanner2::ClearPrivateTags ( )
```

#### 10.267.4.6 ClearPublicTags()

```
void gdcm::Scanner2::ClearPublicTags ( )
```

#### 10.267.4.7 ClearSkipTags()

```
void gdcm::Scanner2::ClearSkipTags ( )
```

#### 10.267.4.8 End()

```
PublicConstIterator gdcm::Scanner2::End ( ) const [inline]
```

#### 10.267.4.9 GetAllFileNamesFromPrivateTagToValue()

```
Directory::FileNamesType gdcm::Scanner2::GetAllFileNamesFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * valueref ) const
```

#### 10.267.4.10 GetAllFileNamesFromPublicTagToValue()

```
Directory::FileNamesType gdcm::Scanner2::GetAllFileNamesFromPublicTagToValue (
    Tag const & t,
    const char * valueref ) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valueref'

#### 10.267.4.11 GetFilenameFromPrivateTagToValue()

```
const char * gdcm::Scanner2::GetFilenameFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * valueref ) const
```

#### 10.267.4.12 GetFilenameFromPublicTagToValue()

```
const char * gdcm::Scanner2::GetFilenameFromPublicTagToValue (
    Tag const & t,
    const char * valueref ) const
```

Will loop over all files and return the first file where value match the reference value 'valueref'

#### 10.267.4.13 GetFileNames()

```
Directory::FileNamesType const & gdcm::Scanner2::GetFileNames ( ) const [inline]
```

Return the list of filenames.

#### 10.267.4.14 GetKeys()

```
Directory::FileNamesType gdc::Scanner2::GetKeys ( ) const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

#### 10.267.4.15 GetMappingFromPrivateTagToValue()

```
PrivateTagToValue const & gdc::Scanner2::GetMappingFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * value ) const
```

#### 10.267.4.16 GetMappingFromPublicTagToValue()

```
PublicTagToValue const & gdc::Scanner2::GetMappingFromPublicTagToValue (
    Tag const & t,
    const char * value ) const
```

See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed.

#### 10.267.4.17 GetPrivateMapping()

```
PrivateTagToValue const & gdc::Scanner2::GetPrivateMapping (
    const char * filename ) const
```

#### 10.267.4.18 GetPrivateMappings()

```
PrivateMappingType const & gdc::Scanner2::GetPrivateMappings ( ) const [inline]
```

#### 10.267.4.19 GetPrivateOrderedValues()

```
Directory::FileNamesType gdc::Scanner2::GetPrivateOrderedValues (
    PrivateTag const & pt ) const
```

#### 10.267.4.20 GetPrivateValue()

```
const char * gdcm::Scanner2::GetPrivateValue (
    const char * filename,
    PrivateTag const & t ) const
```

#### 10.267.4.21 GetPrivateValues()

```
ValueType gdcm::Scanner2::GetPrivateValues (
    PrivateTag const & pt ) const
```

Get all the values found (in lexicographic order) associated with PrivateTag 'pt'.

#### 10.267.4.22 GetPublicMapping()

```
PublicTagToValue const & gdcm::Scanner2::GetPublicMapping (
    const char * filename ) const
```

Get the std::map mapping filenames to value for file 'filename'.

#### 10.267.4.23 GetPublicMappings()

```
PublicMappingType const & gdcm::Scanner2::GetPublicMappings ( ) const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 10.267.4.24 GetPublicOrderedValues()

```
Directory::FileNamesType gdcm::Scanner2::GetPublicOrderedValues (
    Tag const & t ) const
```

Get all the values found (in a vector) associated with Tag 't' This function is identical to GetValues, but is accessible from the wrapped layer (python, C#, java)

#### 10.267.4.25 GetPublicValue()

```
const char * gdcM::Scanner2::GetPublicValue (
    const char * filename,
    Tag const & t ) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the GetMapping function, and then reuse the TagToValue hash table.

##### Warning

Tag 't' should have been added via AddTag() prior to the Scan() call !

#### 10.267.4.26 GetPublicValues()

```
ValueType gdcM::Scanner2::GetPublicValues (
    Tag const & t ) const
```

Get all the values found (in lexicographic order) associated with Tag 't'.

#### 10.267.4.27 GetValues()

```
ValueType const & gdcM::Scanner2::GetValues ( ) const [inline]
```

Get all the values found (in lexicographic order)

#### 10.267.4.28 IsKey()

```
bool gdcM::Scanner2::IsKey (
    const char * filename ) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

#### 10.267.4.29 New()

```
static SmartPointer< Scanner2 > gdcM::Scanner2::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object



#### 10.267.4.30 Print()

```
void gdcm::Scanner2::Print (
    std::ostream & os ) const [override], [virtual]
```

Print result.

Reimplemented from [gdcm::Object](#).

#### 10.267.4.31 PrintTable()

```
void gdcm::Scanner2::PrintTable (
    std::ostream & os,
    bool header = false ) const
```

Print result as CSV table.

#### 10.267.4.32 PrivateBegin()

```
PrivateConstIterator gdcm::Scanner2::PrivateBegin ( ) const [inline]
```

#### 10.267.4.33 PrivateEnd()

```
PrivateConstIterator gdcm::Scanner2::PrivateEnd ( ) const [inline]
```

#### 10.267.4.34 ProcessPrivateTag()

```
void gdcm::Scanner2::ProcessPrivateTag (
    StringFilter & sf,
    const char * filename ) [protected]
```

#### 10.267.4.35 ProcessPublicTag()

```
void gdcm::Scanner2::ProcessPublicTag (
    StringFilter & sf,
    const char * filename ) [protected]
```

### 10.267.4.36 Scan()

```
bool gdcmm::Scanner2::Scan (
    Directory::FileNamesType const & filenames )
```

Start the scan !

## 10.267.5 Friends And Related Function Documentation

### 10.267.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Scanner2 & s ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmScanner2.h](#)

## 10.268 gdcmm::Segment Class Reference

This class defines a segment.

```
#include <gdcmmSegment.h>
```

Inheritance diagram for gdcmm::Segment:

Collaboration diagram for gdcmm::Segment:

### Public Types

- enum [ALGOType](#) {  
[AUTOMATIC](#) = 0 ,  
[SEMIAUTOMATIC](#) ,  
[MANUAL](#) ,  
[ALGOType\\_END](#) }
- typedef std::vector< [SegmentHelper::BasicCodedEntry](#) > [BasicCodedEntryVector](#)
- typedef std::vector< [SmartPointer< Surface >](#) > [SurfaceVector](#)

## Public Member Functions

- [Segment](#) ()
- [~Segment](#) () override
- void [AddSurface](#) ([SmartPointer](#)< [Surface](#) > surface)
- [SegmentHelper::BasicCodedEntry](#) & [GetAnatomicRegion](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetAnatomicRegion](#) () const
- [BasicCodedEntryVector](#) & [GetAnatomicRegionModifiers](#) ()
- [BasicCodedEntryVector](#) const & [GetAnatomicRegionModifiers](#) () const
- [SegmentHelper::BasicCodedEntry](#) & [GetPropertyCategory](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetPropertyCategory](#) () const
- [SegmentHelper::BasicCodedEntry](#) & [GetPropertyType](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetPropertyType](#) () const
- [BasicCodedEntryVector](#) & [GetPropertyTypeModifiers](#) ()
- [BasicCodedEntryVector](#) const & [GetPropertyTypeModifiers](#) () const
- const char \* [GetSegmentAlgorithmName](#) () const
- [ALGOType](#) [GetSegmentAlgorithmType](#) () const
- const char \* [GetSegmentDescription](#) () const
- const char \* [GetSegmentLabel](#) () const
- unsigned short [GetSegmentNumber](#) () const
- [SmartPointer](#)< [Surface](#) > [GetSurface](#) (const unsigned int idx=0) const
- unsigned long [GetSurfaceCount](#) ()
- [SurfaceVector](#) & [GetSurfaces](#) ()
- [SurfaceVector](#) const & [GetSurfaces](#) () const
- void [SetAnatomicRegion](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetAnatomicRegionModifiers](#) ([BasicCodedEntryVector](#) const &BSEV)
- void [SetPropertyCategory](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetPropertyType](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetPropertyTypeModifiers](#) ([BasicCodedEntryVector](#) const &BSEV)
- void [SetSegmentAlgorithmName](#) (const char \*name)
- void [SetSegmentAlgorithmType](#) ([ALGOType](#) type)
- void [SetSegmentAlgorithmType](#) (const char \*typeStr)
- void [SetSegmentDescription](#) (const char \*description)
- void [SetSegmentLabel](#) (const char \*label)
- void [SetSegmentNumber](#) (const unsigned short num)
- void [SetSurfaceCount](#) (const unsigned long nb)

## Static Public Member Functions

- static [ALGOType](#) [GetALGOType](#) (const char \*type)
- static const char \* [GetALGOTypeString](#) ([ALGOType](#) type)

## Protected Attributes

- [SegmentHelper::BasicCodedEntry](#) [AnatomicRegion](#)
- [BasicCodedEntryVector](#) [AnatomicRegionModifiers](#)
- [SegmentHelper::BasicCodedEntry](#) [PropertyCategory](#)
- [SegmentHelper::BasicCodedEntry](#) [PropertyType](#)
- [BasicCodedEntryVector](#) [PropertyTypeModifiers](#)
- `std::string` [SegmentAlgorithmName](#)
- [ALGOType](#) [SegmentAlgorithmType](#)
- `std::string` [SegmentDescription](#)
- `std::string` [SegmentLabel](#)
- `unsigned short` [SegmentNumber](#)
- `unsigned long` [SurfaceCount](#)
- [SurfaceVector](#) [Surfaces](#)

## Additional Inherited Members

### 10.268.1 Detailed Description

This class defines a segment.

It mainly contains attributes of group 0x0062. In addition, it can be associated with surface.

See also

PS 3.3 C.8.20.2 and C.8.23

### 10.268.2 Member Typedef Documentation

#### 10.268.2.1 BasicCodedEntryVector

```
typedef std::vector< SegmentHelper::BasicCodedEntry > gdcm::Segment::BasicCodedEntryVector
```

#### 10.268.2.2 SurfaceVector

```
typedef std::vector< SmartPointer< Surface > > gdcm::Segment::SurfaceVector
```

### 10.268.3 Member Enumeration Documentation

#### 10.268.3.1 ALGOType

```
enum gdcm::Segment::ALGOType
```

## Enumerator

AUTOMATIC	
SEMIAUTOMATIC	
MANUAL	
ALGOType_END	

## 10.268.4 Constructor & Destructor Documentation

### 10.268.4.1 Segment()

```
gdcm::Segment::Segment ( )
```

### 10.268.4.2 ~Segment()

```
gdcm::Segment::~~Segment ( ) [override]
```

## 10.268.5 Member Function Documentation

### 10.268.5.1 AddSurface()

```
void gdcm::Segment::AddSurface (
    SmartPointer< Surface > surface )
```

### 10.268.5.2 GetALGOType()

```
static ALGOType gdcm::Segment::GetALGOType (
    const char * type ) [static]
```

### 10.268.5.3 GetALGOTypeString()

```
static const char * gdcM::Segment::GetALGOTypeString (
    ALGOType type ) [static]
```

### 10.268.5.4 GetAnatomicRegion() [1/2]

```
SegmentHelper::BasicCodedEntry & gdcM::Segment::GetAnatomicRegion ( )
```

### 10.268.5.5 GetAnatomicRegion() [2/2]

```
SegmentHelper::BasicCodedEntry const & gdcM::Segment::GetAnatomicRegion ( ) const
```

### 10.268.5.6 GetAnatomicRegionModifiers() [1/2]

```
BasicCodedEntryVector & gdcM::Segment::GetAnatomicRegionModifiers ( )
```

### 10.268.5.7 GetAnatomicRegionModifiers() [2/2]

```
BasicCodedEntryVector const & gdcM::Segment::GetAnatomicRegionModifiers ( ) const
```

### 10.268.5.8 GetPropertyCategory() [1/2]

```
SegmentHelper::BasicCodedEntry & gdcM::Segment::GetPropertyCategory ( )
```

### 10.268.5.9 GetPropertyCategory() [2/2]

```
SegmentHelper::BasicCodedEntry const & gdcM::Segment::GetPropertyCategory ( ) const
```

**10.268.5.10 GetPropertyType() [1/2]**

```
SegmentHelper::BasicCodedEntry & gdcm::Segment::GetPropertyType ( )
```

**10.268.5.11 GetPropertyType() [2/2]**

```
SegmentHelper::BasicCodedEntry const & gdcm::Segment::GetPropertyType ( ) const
```

**10.268.5.12 GetPropertyTypeModifiers() [1/2]**

```
BasicCodedEntryVector & gdcm::Segment::GetPropertyTypeModifiers ( )
```

**10.268.5.13 GetPropertyTypeModifiers() [2/2]**

```
BasicCodedEntryVector const & gdcm::Segment::GetPropertyTypeModifiers ( ) const
```

**10.268.5.14 GetSegmentAlgorithmName()**

```
const char * gdcm::Segment::GetSegmentAlgorithmName ( ) const
```

**10.268.5.15 GetSegmentAlgorithmType()**

```
ALGOType gdcm::Segment::GetSegmentAlgorithmType ( ) const
```

**10.268.5.16 GetSegmentDescription()**

```
const char * gdcm::Segment::GetSegmentDescription ( ) const
```

**10.268.5.17 GetSegmentLabel()**

```
const char * gdcM::Segment::GetSegmentLabel ( ) const
```

**10.268.5.18 GetSegmentNumber()**

```
unsigned short gdcM::Segment::GetSegmentNumber ( ) const
```

**10.268.5.19 GetSurface()**

```
SmartPointer< Surface > gdcM::Segment::GetSurface (
    const unsigned int idx = 0 ) const
```

**10.268.5.20 GetSurfaceCount()**

```
unsigned long gdcM::Segment::GetSurfaceCount ( )
```

**10.268.5.21 GetSurfaces() [1/2]**

```
SurfaceVector & gdcM::Segment::GetSurfaces ( )
```

**10.268.5.22 GetSurfaces() [2/2]**

```
SurfaceVector const & gdcM::Segment::GetSurfaces ( ) const
```

**10.268.5.23 SetAnatomicRegion()**

```
void gdcM::Segment::SetAnatomicRegion (
    SegmentHelper::BasicCodedEntry const & BSE )
```



#### 10.268.5.24 SetAnatomicRegionModifiers()

```
void gdcm::Segment::SetAnatomicRegionModifiers (
    BasicCodedEntryVector const & BSEV )
```

#### 10.268.5.25 SetPropertyCategory()

```
void gdcm::Segment::SetPropertyCategory (
    SegmentHelper::BasicCodedEntry const & BSE )
```

#### 10.268.5.26 SetPropertyType()

```
void gdcm::Segment::SetPropertyType (
    SegmentHelper::BasicCodedEntry const & BSE )
```

#### 10.268.5.27 SetPropertyTypeModifiers()

```
void gdcm::Segment::SetPropertyTypeModifiers (
    BasicCodedEntryVector const & BSEV )
```

#### 10.268.5.28 SetSegmentAlgorithmName()

```
void gdcm::Segment::SetSegmentAlgorithmName (
    const char * name )
```

#### 10.268.5.29 SetSegmentAlgorithmType() [1/2]

```
void gdcm::Segment::SetSegmentAlgorithmType (
    ALGOType type )
```

**10.268.5.30 SetSegmentAlgorithmType() [2/2]**

```
void gdcM::Segment::SetSegmentAlgorithmType (
    const char * typeStr )
```

**10.268.5.31 SetSegmentDescription()**

```
void gdcM::Segment::SetSegmentDescription (
    const char * description )
```

**10.268.5.32 SetSegmentLabel()**

```
void gdcM::Segment::SetSegmentLabel (
    const char * label )
```

**10.268.5.33 SetSegmentNumber()**

```
void gdcM::Segment::SetSegmentNumber (
    const unsigned short num )
```

**10.268.5.34 SetSurfaceCount()**

```
void gdcM::Segment::SetSurfaceCount (
    const unsigned long nb )
```

**10.268.6 Member Data Documentation****10.268.6.1 AnatomicRegion**

[SegmentHelper::BasicCodedEntry](#) gdcM::Segment::AnatomicRegion [protected]

### 10.268.6.2 AnatomicRegionModifiers

`BasicCodedEntryVector` `gdcm::Segment::AnatomicRegionModifiers` [protected]

### 10.268.6.3 PropertyCategory

`SegmentHelper::BasicCodedEntry` `gdcm::Segment::PropertyCategory` [protected]

### 10.268.6.4 PropertyType

`SegmentHelper::BasicCodedEntry` `gdcm::Segment::PropertyType` [protected]

### 10.268.6.5 PropertyTypeModifiers

`BasicCodedEntryVector` `gdcm::Segment::PropertyTypeModifiers` [protected]

### 10.268.6.6 SegmentAlgorithmName

`std::string` `gdcm::Segment::SegmentAlgorithmName` [protected]

### 10.268.6.7 SegmentAlgorithmType

`ALGOType` `gdcm::Segment::SegmentAlgorithmType` [protected]

### 10.268.6.8 SegmentDescription

`std::string` `gdcm::Segment::SegmentDescription` [protected]

**10.268.6.9 SegmentLabel**

```
std::string gdcM::Segment::SegmentLabel [protected]
```

**10.268.6.10 SegmentNumber**

```
unsigned short gdcM::Segment::SegmentNumber [protected]
```

**10.268.6.11 SurfaceCount**

```
unsigned long gdcM::Segment::SurfaceCount [protected]
```

**10.268.6.12 Surfaces**

```
SurfaceVector gdcM::Segment::Surfaces [protected]
```

The documentation for this class was generated from the following file:

- [gdcMSegment.h](#)

**10.269 gdcM::SegmentedPaletteColorLookupTable Class Reference**

[SegmentedPaletteColorLookupTable](#) class.

```
#include <gdcMSegmentedPaletteColorLookupTable.h>
```

Inheritance diagram for gdcM::SegmentedPaletteColorLookupTable:

Collaboration diagram for gdcM::SegmentedPaletteColorLookupTable:

**Public Member Functions**

- [SegmentedPaletteColorLookupTable](#) ()
- [~SegmentedPaletteColorLookupTable](#) () override
- void [Print](#) (std::ostream &) const override
- void [SetLUT](#) ([LookupTableType](#) type, const unsigned char \*array, unsigned int length) override

*Initialize a [SegmentedPaletteColorLookupTable](#).*

## Additional Inherited Members

### 10.269.1 Detailed Description

[SegmentedPaletteColorLookupTable](#) class.

### 10.269.2 Constructor & Destructor Documentation

#### 10.269.2.1 SegmentedPaletteColorLookupTable()

```
gdcm::SegmentedPaletteColorLookupTable::SegmentedPaletteColorLookupTable ( )
```

#### 10.269.2.2 ~SegmentedPaletteColorLookupTable()

```
gdcm::SegmentedPaletteColorLookupTable::~~SegmentedPaletteColorLookupTable ( ) [override]
```

### 10.269.3 Member Function Documentation

#### 10.269.3.1 Print()

```
void gdcm::SegmentedPaletteColorLookupTable::Print (
    std::ostream & ) const [inline], [override], [virtual]
```

Reimplemented from [gdcm::LookupTable](#).

#### 10.269.3.2 SetLUT()

```
void gdcm::SegmentedPaletteColorLookupTable::SetLUT (
    LookupTableType type,
    const unsigned char * array,
    unsigned int length ) [override], [virtual]
```

Initialize a [SegmentedPaletteColorLookupTable](#).

Reimplemented from [gdcm::LookupTable](#).

The documentation for this class was generated from the following file:

- [gdcmSegmentedPaletteColorLookupTable.h](#)

## 10.270 gdcm::SegmentReader Class Reference

This class defines a segment reader.

```
#include <gdcmSegmentReader.h>
```

Inheritance diagram for gdcm::SegmentReader:

Collaboration diagram for gdcm::SegmentReader:

### Public Types

- typedef std::vector< [SmartPointer< Segment >](#) > [SegmentVector](#)

### Public Member Functions

- [SegmentReader](#) ()
  - [~SegmentReader](#) () override
  - [SegmentVector](#) [GetSegments](#) ()
  - const [SegmentVector](#) [GetSegments](#) () const
  - bool [Read](#) () override
- Read.*

### Protected Types

- typedef std::map< unsigned long, [SmartPointer< Segment >](#) > [SegmentMap](#)

### Protected Member Functions

- bool [ReadSegment](#) (const [Item](#) &segmentItem, const unsigned int idx)
- bool [ReadSegments](#) ()

### Protected Attributes

- [SegmentMap](#) [Segments](#)

#### 10.270.1 Detailed Description

This class defines a segment reader.

It reads attributes of group 0x0062.

See also

PS 3.3 C.8.20.2 and C.8.23

## 10.270.2 Member Typedef Documentation

### 10.270.2.1 SegmentMap

```
typedef std::map< unsigned long, SmartPointer< Segment > > gdcm::SegmentReader::SegmentMap [protected]
```

### 10.270.2.2 SegmentVector

```
typedef std::vector< SmartPointer< Segment > > gdcm::SegmentReader::SegmentVector
```

## 10.270.3 Constructor & Destructor Documentation

### 10.270.3.1 SegmentReader()

```
gdcm::SegmentReader::SegmentReader ( )
```

### 10.270.3.2 ~SegmentReader()

```
gdcm::SegmentReader::~~SegmentReader ( ) [override]
```

## 10.270.4 Member Function Documentation

### 10.270.4.1 GetSegments() [1/2]

```
SegmentVector gdcm::SegmentReader::GetSegments ( )
```

#### 10.270.4.2 GetSegments() [2/2]

```
const SegmentVector gdcm::SegmentReader::GetSegments ( ) const
```

#### 10.270.4.3 Read()

```
bool gdcm::SegmentReader::Read ( ) [override], [virtual]
```

Read.

Reimplemented from [gdcm::Reader](#).

Reimplemented in [gdcm::SurfaceReader](#).

#### 10.270.4.4 ReadSegment()

```
bool gdcm::SegmentReader::ReadSegment (
    const Item & segmentItem,
    const unsigned int idx ) [protected]
```

#### 10.270.4.5 ReadSegments()

```
bool gdcm::SegmentReader::ReadSegments ( ) [protected]
```

### 10.270.5 Member Data Documentation

#### 10.270.5.1 Segments

```
SegmentMap gdcm::SegmentReader::Segments [protected]
```

The documentation for this class was generated from the following file:

- [gdcmSegmentReader.h](#)



## 10.271 gdcm::SegmentWriter Class Reference

This class defines a segment writer.

```
#include <gdcmSegmentWriter.h>
```

Inheritance diagram for gdcm::SegmentWriter:

Collaboration diagram for gdcm::SegmentWriter:

### Public Types

- typedef std::vector< [SmartPointer](#)< [Segment](#) > > [SegmentVector](#)

### Public Member Functions

- [SegmentWriter](#) ()
- [~SegmentWriter](#) () override
- void [AddSegment](#) ([SmartPointer](#)< [Segment](#) > segment)
- unsigned int [GetNumberOfSegments](#) () const
- [SmartPointer](#)< [Segment](#) > [GetSegment](#) (const unsigned int idx=0) const
- [SegmentVector](#) & [GetSegments](#) ()
- const [SegmentVector](#) & [GetSegments](#) () const
- void [SetNumberOfSegments](#) (const unsigned int size)
- void [SetSegments](#) ([SegmentVector](#) &segments)
- bool [Write](#) () override

*Write.*

### Protected Member Functions

- bool [PrepareWrite](#) ()

### Protected Attributes

- [SegmentVector](#) [Segments](#)

#### 10.271.1 Detailed Description

This class defines a segment writer.

It writes attributes of group 0x0062.

See also

PS 3.3 C.8.20.2 and C.8.23

## 10.271.2 Member Typedef Documentation

### 10.271.2.1 SegmentVector

```
typedef std::vector< SmartPointer< Segment > > gdcM::SegmentWriter::SegmentVector
```

## 10.271.3 Constructor & Destructor Documentation

### 10.271.3.1 SegmentWriter()

```
gdcM::SegmentWriter::SegmentWriter ( )
```

### 10.271.3.2 ~SegmentWriter()

```
gdcM::SegmentWriter::~~SegmentWriter ( ) [override]
```

## 10.271.4 Member Function Documentation

### 10.271.4.1 AddSegment()

```
void gdcM::SegmentWriter::AddSegment (  
    SmartPointer< Segment > segment )
```

### 10.271.4.2 GetNumberOfSegments()

```
unsigned int gdcM::SegmentWriter::GetNumberOfSegments ( ) const
```

#### 10.271.4.3 GetSegment()

```
SmartPointer< Segment > gdcm::SegmentWriter::GetSegment (
    const unsigned int idx = 0 ) const
```

#### 10.271.4.4 GetSegments() [1/2]

```
SegmentVector & gdcm::SegmentWriter::GetSegments ( )
```

#### 10.271.4.5 GetSegments() [2/2]

```
const SegmentVector & gdcm::SegmentWriter::GetSegments ( ) const
```

#### 10.271.4.6 PrepareWrite()

```
bool gdcm::SegmentWriter::PrepareWrite ( ) [protected]
```

#### 10.271.4.7 SetNumberOfSegments()

```
void gdcm::SegmentWriter::SetNumberOfSegments (
    const unsigned int size )
```

#### 10.271.4.8 SetSegments()

```
void gdcm::SegmentWriter::SetSegments (
    SegmentVector & segments )
```

#### 10.271.4.9 Write()

```
bool gdcM::SegmentWriter::Write ( ) [override], [virtual]
```

Write.

Reimplemented from [gdcM::Writer](#).

Reimplemented in [gdcM::SurfaceWriter](#).

### 10.271.5 Member Data Documentation

#### 10.271.5.1 Segments

```
SegmentVector gdcM::SegmentWriter::Segments [protected]
```

The documentation for this class was generated from the following file:

- [gdcMSegmentWriter.h](#)

## 10.272 gdcM::SequenceOfFragments Class Reference

Class to represent a Sequence Of Fragments.

```
#include <gdcMSequenceOfFragments.h>
```

Inheritance diagram for gdcM::SequenceOfFragments:

Collaboration diagram for gdcM::SequenceOfFragments:

### Public Types

- typedef FragmentVector::const\_iterator [ConstIterator](#)
- typedef std::vector< [Fragment](#) > [FragmentVector](#)
- typedef FragmentVector::iterator [Iterator](#)
- typedef FragmentVector::size\_type [SizeType](#)

## Public Member Functions

- [SequenceOfFragments](#) ()  
*constructor (UndefinedLength by default)*
- void [AddFragment](#) ([Fragment](#) const &item)  
*Appends a [Fragment](#) to the already added ones.*
- [Iterator](#) [Begin](#) ()
- [ConstIterator](#) [Begin](#) () const
- void [Clear](#) () override  
*Clear.*
- unsigned long [ComputeByteLength](#) () const
- [VL](#) [ComputeLength](#) () const
- [Iterator](#) [End](#) ()
- [ConstIterator](#) [End](#) () const
- bool [GetBuffer](#) (char \*buffer, unsigned long length) const
- bool [GetFragBuffer](#) (unsigned int fragNb, char \*buffer, unsigned long &length) const
- const [Fragment](#) & [GetFragment](#) ([SizeType](#) num) const
- [VL](#) [GetLength](#) () const override  
*Returns the SQ length, as read from disk.*
- [SizeType](#) [GetNumberOfFragments](#) () const
- [BasicOffsetTable](#) & [GetTable](#) ()
- const [BasicOffsetTable](#) & [GetTable](#) () const
- bool [operator==](#) (const [Value](#) &val) const override
- void [Print](#) (std::ostream &os) const override
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool)
- void [SetLength](#) ([VL](#) length) override  
*Sets the actual SQ length.*
- template<typename TSwap >  
std::ostream const & [Write](#) (std::ostream &os) const
- bool [WriteBuffer](#) (std::ostream &os) const

## Static Public Member Functions

- static [SmartPointer](#)< [SequenceOfFragments](#) > [New](#) ()

## Additional Inherited Members

### 10.272.1 Detailed Description

Class to represent a Sequence Of Fragments.

**Todo** I do not enforce that Sequence of Fragments ends with a SQ end del

#### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#),  
[GetJPEGSamplePrecision.cxx](#), and [MpegVideoInfo.cs](#).

## 10.272.2 Member Typedef Documentation

### 10.272.2.1 ConstIterator

```
typedef FragmentVector::const_iterator gdcm::SequenceOfFragments::ConstIterator
```

### 10.272.2.2 FragmentVector

```
typedef std::vector<Fragment> gdcm::SequenceOfFragments::FragmentVector
```

### 10.272.2.3 Iterator

```
typedef FragmentVector::iterator gdcm::SequenceOfFragments::Iterator
```

### 10.272.2.4 SizeType

```
typedef FragmentVector::size_type gdcm::SequenceOfFragments::SizeType
```

## 10.272.3 Constructor & Destructor Documentation

### 10.272.3.1 SequenceOfFragments()

```
gdcm::SequenceOfFragments::SequenceOfFragments ( ) [inline]
```

constructor (UndefinedLength by default)

## 10.272.4 Member Function Documentation

#### 10.272.4.1 AddFragment()

```
void gdcm::SequenceOfFragments::AddFragment (
    Fragment const & item )
```

Appends a [Fragment](#) to the already added ones.

#### 10.272.4.2 Begin() [1/2]

```
Iterator gdcm::SequenceOfFragments::Begin ( ) [inline]
```

#### 10.272.4.3 Begin() [2/2]

```
ConstIterator gdcm::SequenceOfFragments::Begin ( ) const [inline]
```

#### 10.272.4.4 Clear()

```
void gdcm::SequenceOfFragments::Clear ( ) [override], [virtual]
```

Clear.

Implements [gdcm::Value](#).

#### 10.272.4.5 ComputeByteLength()

```
unsigned long gdcm::SequenceOfFragments::ComputeByteLength ( ) const
```

#### 10.272.4.6 ComputeLength()

```
VL gdcm::SequenceOfFragments::ComputeLength ( ) const
```

**10.272.4.7 End()** [1/2]

```
Iterator gdcM::SequenceOfFragments::End ( ) [inline]
```

**10.272.4.8 End()** [2/2]

```
ConstIterator gdcM::SequenceOfFragments::End ( ) const [inline]
```

**10.272.4.9 GetBuffer()**

```
bool gdcM::SequenceOfFragments::GetBuffer (
    char * buffer,
    unsigned long length ) const
```

**10.272.4.10 GetFragBuffer()**

```
bool gdcM::SequenceOfFragments::GetFragBuffer (
    unsigned int fragNb,
    char * buffer,
    unsigned long & length ) const
```

**10.272.4.11 GetFragment()**

```
const Fragment & gdcM::SequenceOfFragments::GetFragment (
    SizeType num ) const
```

**Examples**

[DecompressImage.cs](#), [FixBrokenJ2K.cxx](#), and [FixJAIBugJPEGLS.cxx](#).



#### 10.272.4.12 GetLength()

```
VL gdcM::SequenceOfFragments::GetLength ( ) const [inline], [override], [virtual]
```

Returns the SQ length, as read from disk.

Implements [gdcM::Value](#).

#### 10.272.4.13 GetNumberOfFragments()

```
SizeType gdcM::SequenceOfFragments::GetNumberOfFragments ( ) const
```

##### Examples

[FixJAIBugJPEGLS.cxx](#).

#### 10.272.4.14 GetTable() [1/2]

```
BasicOffsetTable & gdcM::SequenceOfFragments::GetTable ( ) [inline]
```

#### 10.272.4.15 GetTable() [2/2]

```
const BasicOffsetTable & gdcM::SequenceOfFragments::GetTable ( ) const [inline]
```

#### 10.272.4.16 New()

```
static SmartPointer< SequenceOfFragments > gdcM::SequenceOfFragments::New ( ) [inline], [static]
```

##### Examples

[DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), and [MpegVideoInfo.cs](#).

#### 10.272.4.17 operator==()

```
bool gdcmm::SequenceOfFragments::operator== (
    const Value & val ) const [inline], [override], [virtual]
```

Implements [gdcmm::Value](#).

#### 10.272.4.18 Print()

```
void gdcmm::SequenceOfFragments::Print (
    std::ostream & os ) const [inline], [override], [virtual]
```

Reimplemented from [gdcmm::Object](#).

#### 10.272.4.19 Read()

```
template<typename TSwap >
std::istream & gdcmm::SequenceOfFragments::Read (
    std::istream & is,
    bool readvalues = true ) [inline]
```

#### 10.272.4.20 ReadPreValue()

```
template<typename TSwap >
std::istream & gdcmm::SequenceOfFragments::ReadPreValue (
    std::istream & is ) [inline]
```

References [gdcmmDebugMacro](#).

#### 10.272.4.21 ReadValue()

```
template<typename TSwap >
std::istream & gdcmm::SequenceOfFragments::ReadValue (
    std::istream & is,
    bool ) [inline]
```

References [gdcmmAssertAlwaysMacro](#), [gdcmmDebugMacro](#), [gdcmmWarningMacro](#), [gdcmm::Tag::GetElement\(\)](#), [gdcmm::Tag::GetGroup\(\)](#), [gdcmm::ByteValue::GetLength\(\)](#), [gdcmm::ByteValue::GetPointer\(\)](#), [gdcmm::DataElement::GetTag\(\)](#), [gdcmm::DataElement::GetVL\(\)](#), [gdcmm::Fragment::Read\(\)](#), [gdcmm::Fragment::ReadBacktrack\(\)](#), and [gdcmm::Exception::what\(\)](#).

#### 10.272.4.22 SetLength()

```
void gdcm::SequenceOfFragments::SetLength (
    VL length ) [inline], [override], [virtual]
```

Sets the actual SQ length.

Implements [gdcm::Value](#).

#### 10.272.4.23 Write()

```
template<typename TSwap >
std::ostream const & gdcm::SequenceOfFragments::Write (
    std::ostream & os ) const [inline]
```

References [gdcm::Tag::Write\(\)](#), and [gdcm::VL::Write\(\)](#).

#### 10.272.4.24 WriteBuffer()

```
bool gdcm::SequenceOfFragments::WriteBuffer (
    std::ostream & os ) const
```

#### Examples

[GetJPEGSamplePrecision.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmSequenceOfFragments.h](#)

## 10.273 gdcm::SequenceOfItems Class Reference

Class to represent a Sequence Of Items.

```
#include <gdcmSequenceOfItems.h>
```

Inheritance diagram for `gdcm::SequenceOfItems`:

Collaboration diagram for `gdcm::SequenceOfItems`:

## Public Types

- typedef ItemVector::const\_iterator [ConstIterator](#)
- typedef std::vector< [Item](#) > [ItemVector](#)
- typedef ItemVector::iterator [Iterator](#)
- typedef ItemVector::size\_type [SizeType](#)

## Public Member Functions

- [SequenceOfItems](#) ()  
*constructor (UndefinedLength by default)*
- void [AddItem](#) ([Item](#) const &item)  
*Appends an [Item](#) to the already added ones.*
- [Item](#) & [AddNewUndefinedLengthItem](#) ()  
*Appends an [Item](#) to the already added ones.*
- [Iterator](#) [Begin](#) ()
- [ConstIterator](#) [Begin](#) () const
- void [Clear](#) () override  
*remove all items within the sequence*
- template<typename TDE >  
[VL ComputeLength](#) () const
- [Iterator](#) [End](#) ()
- [ConstIterator](#) [End](#) () const
- bool [FindDataElement](#) (const [Tag](#) &t) const
- [Item](#) & [GetItem](#) ([SizeType](#) position)
- const [Item](#) & [GetItem](#) ([SizeType](#) position) const
- [VL GetLength](#) () const override  
*Returns the SQ length, as read from disk.*
- [SizeType](#) [GetNumberOfItems](#) () const
- bool [IsEmpty](#) () const
- bool [IsUndefinedLength](#) () const  
*return if [Value](#) Length if of undefined length*
- [SequenceOfItems](#) & [operator=](#) (const [SequenceOfItems](#) &val)
- bool [operator==](#) (const [Value](#) &val) const override
- void [Print](#) (std::ostream &os) const override
- template<typename TDE , typename TSwap >  
std::istream & [Read](#) (std::istream &is, bool readvalues=true)
- bool [RemoveItemByIndex](#) (const [SizeType](#) index)
- void [SetLength](#) ([VL](#) length) override  
*Sets the actual SQ length.*
- void [SetLengthToUndefined](#) ()  
*Properly set the Sequence of [Item](#) to be undefined length.*
- void [SetNumberOfItems](#) ([SizeType](#) n)
- template<typename TDE , typename TSwap >  
std::ostream const & [Write](#) (std::ostream &os) const

## Static Public Member Functions

- static [SmartPointer](#)< [SequenceOfItems](#) > [New](#) ()

## Public Attributes

- [ItemVector Items](#)  
*Vector of Sequence Items.*
- [VL SequenceLengthField](#)  
*Total length of the Sequence (or 0xffffffff if undefined).*

## Additional Inherited Members

### 10.273.1 Detailed Description

Class to represent a Sequence Of Items.

(value representation : SQ)

- a [Value](#) Representation for Data Elements that contains a sequence of Data Sets.
- Sequence of [Item](#) allows for Nested Data Sets

See PS 3.5, 7.4.6 Data [Element Type](#) Within a Sequence

#### Note

SEQUENCE OF ITEMS (VALUE REPRESENTATION SQ) A [Value](#) Representation for Data Elements that contain a sequence of Data Sets. Sequence of Items allows for Nested Data Sets.

#### Examples

[DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSequenceUltrasound.cxx](#), and [ReadExplicitLengthSQIVR.cxx](#).

### 10.273.2 Member Typedef Documentation

#### 10.273.2.1 ConstIterator

```
typedef ItemVector::const_iterator gdcm::SequenceOfItems::ConstIterator
```

### 10.273.2.2 ItemVector

```
typedef std::vector< Item > gdcM::SequenceOfItems::ItemVector
```

### 10.273.2.3 Iterator

```
typedef ItemVector::iterator gdcM::SequenceOfItems::Iterator
```

### 10.273.2.4 SizeType

```
typedef ItemVector::size_type gdcM::SequenceOfItems::SizeType
```

## 10.273.3 Constructor & Destructor Documentation

### 10.273.3.1 SequenceOfItems()

```
gdcM::SequenceOfItems::SequenceOfItems ( ) [inline]
```

constructor (UndefinedLength by default)

## 10.273.4 Member Function Documentation

### 10.273.4.1 AddItem()

```
void gdcM::SequenceOfItems::AddItem (  
    Item const & item )
```

Appends an [Item](#) to the already added ones.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#).

#### 10.273.4.2 AddNewUndefinedLengthItem()

```
Item & gdcm::SequenceOfItems::AddNewUndefinedLengthItem ( )
```

Appends an [Item](#) to the already added ones.

#### 10.273.4.3 Begin() [1/2]

```
Iterator gdcm::SequenceOfItems::Begin ( ) [inline]
```

#### 10.273.4.4 Begin() [2/2]

```
ConstIterator gdcm::SequenceOfItems::Begin ( ) const [inline]
```

#### 10.273.4.5 Clear()

```
void gdcm::SequenceOfItems::Clear ( ) [override], [virtual]
```

remove all items within the sequence

Implements [gdcm::Value](#).

#### 10.273.4.6 ComputeLength()

```
template<typename TDE >  
VL gdcm::SequenceOfItems::ComputeLength ( ) const
```

#### 10.273.4.7 End() [1/2]

```
Iterator gdcm::SequenceOfItems::End ( ) [inline]
```

#### 10.273.4.8 End() [2/2]

```
ConstIterator gdcm::SequenceOfItems::End ( ) const [inline]
```

#### 10.273.4.9 FindDataElement()

```
bool gdcm::SequenceOfItems::FindDataElement (
    const Tag & t ) const
```

#### 10.273.4.10 GetItem() [1/2]

```
Item & gdcm::SequenceOfItems::GetItem (
    SizeType position )
```

#### 10.273.4.11 GetItem() [2/2]

```
const Item & gdcm::SequenceOfItems::GetItem (
    SizeType position ) const
```

#### Examples

[DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [ExtractEncryptedContent.cxx](#), and [GetSequenceUltrasound.cxx](#).

#### 10.273.4.12 GetLength()

```
VL gdcm::SequenceOfItems::GetLength ( ) const [inline], [override], [virtual]
```

Returns the SQ length, as read from disk.

Implements [gdcm::Value](#).



#### 10.273.4.13 GetNumberOfItems()

```
SizeType gdcm::SequenceOfItems::GetNumberOfItems ( ) const [inline]
```

##### Examples

[DumpExamCard.cxx](#), [DumpGEMSMovieGroup.cxx](#), [ExtractEncryptedContent.cxx](#), and [GetSequenceUltrasound.cxx](#).

#### 10.273.4.14 IsEmpty()

```
bool gdcm::SequenceOfItems::IsEmpty ( ) const [inline]
```

#### 10.273.4.15 IsUndefinedLength()

```
bool gdcm::SequenceOfItems::IsUndefinedLength ( ) const [inline]
```

return if [Value](#) Length if of undefined length

#### 10.273.4.16 New()

```
static SmartPointer< SequenceOfItems > gdcm::SequenceOfItems::New ( ) [inline], [static]
```

##### Examples

[NewSequence.cs](#).

#### 10.273.4.17 operator=()

```
SequenceOfItems & gdcm::SequenceOfItems::operator= (
    const SequenceOfItems & val ) [inline]
```

References [Items](#), and [SequenceLengthField](#).

#### 10.273.4.18 operator==( )

```
bool gdcm::SequenceOfItems::operator== (
    const Value & val ) const [inline], [override], [virtual]
```

Implements [gdcm::Value](#).

References [Items](#), and [SequenceLengthField](#).

#### 10.273.4.19 Print()

```
void gdcm::SequenceOfItems::Print (
    std::ostream & os ) const [inline], [override], [virtual]
```

Reimplemented from [gdcm::Object](#).

#### 10.273.4.20 Read()

```
template<typename TDE , typename TSwap >
std::istream & gdcm::SequenceOfItems::Read (
    std::istream & is,
    bool readvalues = true ) [inline]
```

References [gdcm::Item::Clear\(\)](#), [gdcmDebugMacro](#), [gdcmWarningMacro](#), [gdcm::Exception::GetDescription\(\)](#), [gdcm::Item::GetNestedDataSet\(\)](#), [gdcm::DataElement::GetTag\(\)](#), [gdcm::DataElement::GetVL\(\)](#), [gdcm::Item::Read\(\)](#), and [gdcm::DataSet::Size\(\)](#).

#### 10.273.4.21 RemoveItemByIndex()

```
bool gdcm::SequenceOfItems::RemoveItemByIndex (
    const SizeType index )
```

Remove an [Item](#) as specified by its index, if index > size, false is returned Index starts at 1 not 0

#### 10.273.4.22 SetLength()

```
void gdcm::SequenceOfItems::SetLength (
    VL length ) [inline], [override], [virtual]
```

Sets the actual SQ length.

Implements [gdcm::Value](#).

#### 10.273.4.23 SetLengthToUndefined()

```
void gdcm::SequenceOfItems::SetLengthToUndefined ( )
```

Properly set the Sequence of [Item](#) to be undefined length.

#### 10.273.4.24 SetNumberOfItems()

```
void gdcm::SequenceOfItems::SetNumberOfItems (
    SizeType n ) [inline]
```

#### 10.273.4.25 Write()

```
template<typename TDE , typename TSwap >
std::ostream const & gdcm::SequenceOfItems::Write (
    std::ostream & os ) const [inline]
```

References [gdcm::Tag::Write\(\)](#), and [gdcm::VL::Write\(\)](#).

### 10.273.5 Member Data Documentation

#### 10.273.5.1 Items

```
ItemVector gdcm::SequenceOfItems::Items
```

Vector of Sequence Items.

Referenced by [operator=\(\)](#), and [operator==\(\)](#).

#### 10.273.5.2 SequenceLengthField

```
VL gdcm::SequenceOfItems::SequenceLengthField
```

Total length of the Sequence (or 0xffffffff if undefined).

Referenced by [operator=\(\)](#), and [operator==\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmSequenceOfItems.h](#)

## 10.274 gdcm::SerieHelper Class Reference

[SerieHelper](#) DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

```
#include <gdcmSerieHelper.h>
```

Collaboration diagram for gdcm::SerieHelper:

### Public Member Functions

- [SerieHelper](#) ()
- [~SerieHelper](#) ()
- void [AddRestriction](#) (const std::string &tag)
- void [AddRestriction](#) (uint16\_t group, uint16\_t [elem](#), std::string const &[value](#), int [op](#))
- void [Clear](#) ()
- void [CreateDefaultUniqueSeriesIdentifier](#) ()
- std::string [CreateUniqueSeriesIdentifier](#) ([File](#) \*inFile)
- [FileList](#) \* [GetFirstSingleSerieUIDFileSet](#) ()
- [FileList](#) \* [GetNextSingleSerieUIDFileSet](#) ()
- void [OrderFileList](#) ([FileList](#) \*fileSet)
- void [SetDirectory](#) (std::string const &dir, bool recursive=false)
- void [SetLoadMode](#) (int)
- void [SetUseSeriesDetails](#) (bool useSeriesDetails)

### Protected Types

- using [Rule](#) = RuleStructure{ uint16\_t group
- typedef std::vector< [Rule](#) > [SerieRestrictions](#)
- typedef std::map< std::string, [FileList](#) \* > [SingleSerieUIDFileSetmap](#)

### Protected Member Functions

- bool [AddFile](#) ([FileWithName](#) &header)
- void [AddFileName](#) (std::string const &filename)
- void [AddRestriction](#) (const [Tag](#) &tag)
- bool [FileNameOrdering](#) ([FileList](#) \*fileList)
- bool [ImageNumberOrdering](#) ([FileList](#) \*fileList)
- bool [ImagePositionPatientOrdering](#) ([FileList](#) \*fileSet)
- bool [UserOrdering](#) ([FileList](#) \*fileSet)

### Protected Attributes

- uint16\_t [elem](#)
- SingleSerieUIDFileSetmap::iterator [ItFileSetHt](#)
- int [op](#)
- [SingleSerieUIDFileSetmap](#) [SingleSerieUIDFileSetHT](#)
- std::string [value](#)

### 10.274.1 Detailed Description

[SerieHelper](#) DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.

Instead see [ImageHelper](#) or [IPPSorter](#)

### 10.274.2 Member Typedef Documentation

#### 10.274.2.1 Rule

```
using gdcm::SerieHelper::Rule = RuleStructure{ uint16_t group [protected]
```

#### 10.274.2.2 SerieRestrictions

```
typedef std::vector<Rule> gdcm::SerieHelper::SerieRestrictions [protected]
```

#### 10.274.2.3 SingleSerieUIDFileSetmap

```
typedef std::map<std::string, FileList *> gdcm::SerieHelper::SingleSerieUIDFileSetmap [protected]
```

### 10.274.3 Constructor & Destructor Documentation

#### 10.274.3.1 SerieHelper()

```
gdcm::SerieHelper::SerieHelper ( )
```

#### 10.274.3.2 ~SerieHelper()

```
gdcm::SerieHelper::~~SerieHelper ( )
```

## 10.274.4 Member Function Documentation

### 10.274.4.1 AddFile()

```
bool gdcM::SerieHelper::AddFile (
    FileWithName & header ) [protected]
```

### 10.274.4.2 AddFileName()

```
void gdcM::SerieHelper::AddFileName (
    std::string const & filename ) [protected]
```

### 10.274.4.3 AddRestriction() [1/3]

```
void gdcM::SerieHelper::AddRestriction (
    const std::string & tag )
```

### 10.274.4.4 AddRestriction() [2/3]

```
void gdcM::SerieHelper::AddRestriction (
    const Tag & tag ) [protected]
```

### 10.274.4.5 AddRestriction() [3/3]

```
void gdcM::SerieHelper::AddRestriction (
    uint16_t group,
    uint16_t elem,
    std::string const & value,
    int op )
```

#### 10.274.4.6 Clear()

```
void gdcm::SerieHelper::Clear ( )
```

#### 10.274.4.7 CreateDefaultUniqueSeriesIdentifier()

```
void gdcm::SerieHelper::CreateDefaultUniqueSeriesIdentifier ( )
```

#### 10.274.4.8 CreateUniqueSeriesIdentifier()

```
std::string gdcm::SerieHelper::CreateUniqueSeriesIdentifier (
    File * inFile )
```

#### 10.274.4.9 FileNameOrdering()

```
bool gdcm::SerieHelper::FileNameOrdering (
    FileList * fileList ) [protected]
```

#### 10.274.4.10 GetFirstSingleSerieUIDFileSet()

```
FileList * gdcm::SerieHelper::GetFirstSingleSerieUIDFileSet ( )
```

#### 10.274.4.11 GetNextSingleSerieUIDFileSet()

```
FileList * gdcm::SerieHelper::GetNextSingleSerieUIDFileSet ( )
```

#### 10.274.4.12 ImageNumberOrdering()

```
bool gdcm::SerieHelper::ImageNumberOrdering (
    FileList * fileList ) [protected]
```

**10.274.4.13 ImagePositionPatientOrdering()**

```
bool gdcmm::SerieHelper::ImagePositionPatientOrdering (
    FileList * fileSet ) [protected]
```

**10.274.4.14 OrderFileList()**

```
void gdcmm::SerieHelper::OrderFileList (
    FileList * fileSet )
```

**10.274.4.15 SetDirectory()**

```
void gdcmm::SerieHelper::SetDirectory (
    std::string const & dir,
    bool recursive = false )
```

**10.274.4.16 SetLoadMode()**

```
void gdcmm::SerieHelper::SetLoadMode (
    int ) [inline]
```

**10.274.4.17 SetUseSeriesDetails()**

```
void gdcmm::SerieHelper::SetUseSeriesDetails (
    bool useSeriesDetails )
```

**10.274.4.18 UserOrdering()**

```
bool gdcmm::SerieHelper::UserOrdering (
    FileList * fileSet ) [protected]
```

**10.274.5 Member Data Documentation**



### 10.274.5.1 elem

```
uint16_t gdcm::SerieHelper::elem [protected]
```

### 10.274.5.2 ItFileSetHt

```
SingleSerieUIDFileSetmap::iterator gdcm::SerieHelper::ItFileSetHt [protected]
```

### 10.274.5.3 op

```
int gdcm::SerieHelper::op [protected]
```

### 10.274.5.4 SingleSerieUIDFileSetHT

```
SingleSerieUIDFileSetmap gdcm::SerieHelper::SingleSerieUIDFileSetHT [protected]
```

### 10.274.5.5 value

```
std::string gdcm::SerieHelper::value [protected]
```

The documentation for this class was generated from the following file:

- [gdcmSerieHelper.h](#)

## 10.275 gdcm::Series Class Reference

[Series](#).

```
#include <gdcmSeries.h>
```

### Public Member Functions

- [Series](#) ()=default

### 10.275.1 Detailed Description

[Series](#).

### 10.275.2 Constructor & Destructor Documentation

#### 10.275.2.1 Series()

```
gdcm::Series::Series ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmSeries.h](#)

## 10.276 gdcm::network::ServiceClassApplicationInformation Class Reference

```
#include <gdcmServiceClassApplicationInformation.h>
```

### Public Member Functions

- [ServiceClassApplicationInformation](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetTuple](#) (uint8\_t levelofsupport, uint8\_t levelofdigitalsig, uint8\_t elementcoercion)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.276.1 Detailed Description

PS 3.4 [Table B.3-1](#) SERVICE-CLASS-APPLICATION-INFORMATION (A-ASSOCIATE-RQ)

### 10.276.2 Constructor & Destructor Documentation

### 10.276.2.1 ServiceClassApplicationInformation()

```
gdcm::network::ServiceClassApplicationInformation::ServiceClassApplicationInformation ( )
```

## 10.276.3 Member Function Documentation

### 10.276.3.1 Print()

```
void gdcm::network::ServiceClassApplicationInformation::Print (
    std::ostream & os ) const
```

### 10.276.3.2 Read()

```
std::istream & gdcm::network::ServiceClassApplicationInformation::Read (
    std::istream & is )
```

### 10.276.3.3 SetTuple()

```
void gdcm::network::ServiceClassApplicationInformation::SetTuple (
    uint8_t levelofsupport,
    uint8_t levelofdigitalsig,
    uint8_t elementcoercion )
```

### 10.276.3.4 Size()

```
size_t gdcm::network::ServiceClassApplicationInformation::Size ( ) const
```

### 10.276.3.5 Write()

```
const std::ostream & gdcm::network::ServiceClassApplicationInformation::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmServiceClassApplicationInformation.h](#)

## 10.277 gdcm::ServiceClassUser Class Reference

[ServiceClassUser](#).

```
#include <gdcmServiceClassUser.h>
```

Inheritance diagram for gdcm::ServiceClassUser:

Collaboration diagram for gdcm::ServiceClassUser:

### Public Member Functions

- [ServiceClassUser](#) ()
- [ServiceClassUser](#) (const [ServiceClassUser](#) &)=delete
- [~ServiceClassUser](#) () override
- const char \* [GetAETitle](#) () const
- const char \* [GetCalledAETitle](#) () const
- double [GetTimeout](#) () const
- bool [InitializeConnection](#) ()
- bool [IsPresentationContextAccepted](#) (const [PresentationContext](#) &pc) const  
*Return if the passed in presentation was accepted during association negotiation.*
- void [operator=](#) (const [ServiceClassUser](#) &)=delete
- bool [SendEcho](#) ()  
*C-ECHO.*
- bool [SendFind](#) (const [BaseRootQuery](#) \*query, std::vector< [DataSet](#) > &retDatasets)  
*C-FIND a query, return result are in retDatasets.*
- bool [SendMove](#) (const [BaseRootQuery](#) \*query, const char \*outputdir)  
*Execute a C-MOVE, based on query, return files are written in outputdir.*
- bool [SendMove](#) (const [BaseRootQuery](#) \*query, std::vector< [DataSet](#) > &retDatasets)  
*Execute a C-MOVE, based on query, returned dataset are Implicit.*
- bool [SendMove](#) (const [BaseRootQuery](#) \*query, std::vector< [File](#) > &retFile)  
*Execute a C-MOVE, based on query, returned Files are stored in vector.*
- bool [SendStore](#) (const char \*filename)  
*Execute a C-STORE on file on disk, named filename.*
- bool [SendStore](#) ([DataSet](#) const &ds)  
*Execute a C-STORE on a DataSet, the transfer syntax used will be Implicit.*
- bool [SendStore](#) ([File](#) const &file)
- void [SetAETitle](#) (const char \*aetitle)  
*set calling ae title*
- void [SetCalledAETitle](#) (const char \*aetitle)  
*set called ae title*
- void [SetHostname](#) (const char \*hostname)  
*Set the name of the called hostname (hostname or IP address)*
- void [SetPort](#) (uint16\_t port)  
*Set port of remote host (called application)*
- void [SetPortSCP](#) (uint16\_t portscp)  
*Set the port for any incoming C-STORE-SCP operation (typically in a return of C-MOVE)*

- void [SetPresentationContexts](#) (std::vector< [PresentationContext](#) > const &pcs)  
*Set the Presentation Context used for the Association.*
- void [SetTimeout](#) (double t)  
*set/get Timeout*
- bool [StartAssociation](#) ()  
*Start the association. Need to call SetPresentationContexts before.*
- bool [StopAssociation](#) ()  
*Stop the running association.*

## Static Public Member Functions

- static [SmartPointer](#)< [ServiceClassUser](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Additional Inherited Members

### 10.277.1 Detailed Description

[ServiceClassUser](#).

Examples

[CStoreQtProgress.cxx](#).

### 10.277.2 Constructor & Destructor Documentation

#### 10.277.2.1 ServiceClassUser() [1/2]

```
gdcm::ServiceClassUser::ServiceClassUser ( )
```

Construct a SCU with default:

- hostname = localhost
- port = 104

#### 10.277.2.2 ~ServiceClassUser()

```
gdcm::ServiceClassUser::~~ServiceClassUser ( ) [override]
```

### 10.277.2.3 ServiceClassUser() [2/2]

```
gdcm::ServiceClassUser::ServiceClassUser (
    const ServiceClassUser & ) [delete]
```

## 10.277.3 Member Function Documentation

### 10.277.3.1 GetAETitle()

```
const char * gdcm::ServiceClassUser::GetAETitle ( ) const
```

### 10.277.3.2 GetCalledAETitle()

```
const char * gdcm::ServiceClassUser::GetCalledAETitle ( ) const
```

### 10.277.3.3 GetTimeout()

```
double gdcm::ServiceClassUser::GetTimeout ( ) const
```

### 10.277.3.4 InitializeConnection()

```
bool gdcm::ServiceClassUser::InitializeConnection ( )
```

Will try to connect This will setup the actual timeout used during the whole connection time. Need to call SetTimeout first

#### Examples

[CStoreQtProgress.cxx](#).

### 10.277.3.5 IsPresentationContextAccepted()

```
bool gdcm::ServiceClassUser::IsPresentationContextAccepted (
    const PresentationContext & pc ) const
```

Return if the passed in presentation was accepted during association negotiation.

### 10.277.3.6 New()

```
static SmartPointer< ServiceClassUser > gdcm::ServiceClassUser::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

### 10.277.3.7 operator=()

```
void gdcm::ServiceClassUser::operator= (
    const ServiceClassUser & ) [delete]
```

### 10.277.3.8 SendEcho()

```
bool gdcm::ServiceClassUser::SendEcho ( )
```

C-ECHO.

### 10.277.3.9 SendFind()

```
bool gdcm::ServiceClassUser::SendFind (
    const BaseRootQuery * query,
    std::vector< DataSet > & retDatasets )
```

C-FIND a query, return result are in retDatasets.

**10.277.3.10 SendMove()** [1/3]

```
bool gdcm::ServiceClassUser::SendMove (
    const BaseRootQuery * query,
    const char * outputdir )
```

Execute a C-MOVE, based on query, return files are written in outputdir.

**10.277.3.11 SendMove()** [2/3]

```
bool gdcm::ServiceClassUser::SendMove (
    const BaseRootQuery * query,
    std::vector< DataSet > & retDatasets )
```

Execute a C-MOVE, based on query, returned dataset are Implicit.

**10.277.3.12 SendMove()** [3/3]

```
bool gdcm::ServiceClassUser::SendMove (
    const BaseRootQuery * query,
    std::vector< File > & retFile )
```

Execute a C-MOVE, based on query, returned Files are stored in vector.

**10.277.3.13 SendStore()** [1/3]

```
bool gdcm::ServiceClassUser::SendStore (
    const char * filename )
```

Execute a C-STORE on file on disk, named filename.

**Examples**

[CStoreQtProgress.cxx](#).



**10.277.3.14 SendStore()** [2/3]

```
bool gdcm::ServiceClassUser::SendStore (
    DataSet const & ds )
```

Execute a C-STORE on a [DataSet](#), the transfer syntax used will be Implicit.

**10.277.3.15 SendStore()** [3/3]

```
bool gdcm::ServiceClassUser::SendStore (
    File const & file )
```

Execute a C-STORE on a [File](#), the transfer syntax used for the query is based on the file.

**10.277.3.16 SetAETitle()**

```
void gdcm::ServiceClassUser::SetAETitle (
    const char * aetitle )
```

set calling ae title

**10.277.3.17 SetCalledAETitle()**

```
void gdcm::ServiceClassUser::SetCalledAETitle (
    const char * aetitle )
```

set called ae title

**Examples**

[CStoreQtProgress.cxx](#).

**10.277.3.18 SetHostname()**

```
void gdcm::ServiceClassUser::SetHostname (
    const char * hostname )
```

Set the name of the called hostname (hostname or IP address)

**Examples**

[CStoreQtProgress.cxx](#).

**10.277.3.19 SetPort()**

```
void gdcm::ServiceClassUser::SetPort (
    uint16_t port )
```

Set port of remote host (called application)

**Examples**

[CStoreQtProgress.cxx](#).

**10.277.3.20 SetPortSCP()**

```
void gdcm::ServiceClassUser::SetPortSCP (
    uint16_t portscp )
```

Set the port for any incoming C-STORE-SCP operation (typically in a return of C-MOVE)

**10.277.3.21 SetPresentationContexts()**

```
void gdcm::ServiceClassUser::SetPresentationContexts (
    std::vector< PresentationContext > const & pcs )
```

Set the Presentation Context used for the Association.

**Examples**

[CStoreQtProgress.cxx](#).

**10.277.3.22 SetTimeout()**

```
void gdcm::ServiceClassUser::SetTimeout (
    double t )
```

set/get Timeout

**Examples**

[CStoreQtProgress.cxx](#).

### 10.277.3.23 StartAssociation()

```
bool gdcm::ServiceClassUser::StartAssociation ( )
```

Start the association. Need to call SetPresentationContexts before.

#### Examples

[CStoreQtProgress.cxx](#).

### 10.277.3.24 StopAssociation()

```
bool gdcm::ServiceClassUser::StopAssociation ( )
```

Stop the running association.

#### Examples

[CStoreQtProgress.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmServiceClassUser.h](#)

## 10.278 gdcm::SHA1 Class Reference

Class for [SHA1](#).

```
#include <gdcmSHA1.h>
```

### Public Member Functions

- [SHA1](#) ()
- [SHA1](#) (const [SHA1](#) &)=delete
- [~SHA1](#) ()
- void [operator=](#) (const [SHA1](#) &)=delete

### Static Public Member Functions

- static bool [Compute](#) (const char \*buffer, unsigned long buf\_len, char digest\_str[20 \*2+1])
- static bool [ComputeFile](#) (const char \*filename, char digest\_str[20 \*2+1])

## 10.278.1 Detailed Description

Class for [SHA1](#).

### Warning

this class is able to pick from one implementation:

1. the one from OpenSSL (when GDCM\_USE\_SYSTEM\_OPENSSL is turned ON)

In all other cases it will return an error

## 10.278.2 Constructor & Destructor Documentation

### 10.278.2.1 SHA1() [1/2]

```
gdc::SHA1::SHA1 ( )
```

### 10.278.2.2 ~SHA1()

```
gdc::SHA1::~~SHA1 ( )
```

### 10.278.2.3 SHA1() [2/2]

```
gdc::SHA1::SHA1 (
    const SHA1 & ) [delete]
```

## 10.278.3 Member Function Documentation

### 10.278.3.1 Compute()

```
static bool gdc::SHA1::Compute (
    const char * buffer,
    unsigned long buf_len,
    char digest_str[20 *2+1] ) [static]
```

### 10.278.3.2 ComputeFile()

```
static bool gdcm::SHA1::ComputeFile (
    const char * filename,
    char digest_str[20 *2+1] ) [static]
```

### 10.278.3.3 operator=()

```
void gdcm::SHA1::operator= (
    const SHA1 & ) [delete]
```

The documentation for this class was generated from the following file:

- [gdcmSHA1.h](#)

## 10.279 gdcm::SimpleMemberCommand< T > Class Template Reference

[Command](#) subclass that calls a pointer to a member function.

```
#include <gdcmCommand.h>
```

Inheritance diagram for gdcm::SimpleMemberCommand< T >:

Collaboration diagram for gdcm::SimpleMemberCommand< T >:

### Public Types

- typedef [SimpleMemberCommand](#) Self
- typedef void(T::\* [TMemberFunctionPointer](#)) ()

### Public Member Functions

- [SimpleMemberCommand](#) (const [Self](#) &)=delete
- void [Execute](#) (const [Subject](#) \*, const [Event](#) &) override
- void [Execute](#) ([Subject](#) \*, const [Event](#) &) override
- void [operator=](#) (const [Self](#) &)=delete
- void [SetCallbackFunction](#) (T \*object, [TMemberFunctionPointer](#) memberFunction)

### Static Public Member Functions

- static [SmartPointer](#)< [SimpleMemberCommand](#) > [New](#) ()

## Protected Member Functions

- [SimpleMemberCommand](#) ()
- [~SimpleMemberCommand](#) () override=default

## Protected Attributes

- [TMemberFunctionPointer](#) [m\\_MemberFunction](#)
- [T](#) \* [m\\_This](#)

### 10.279.1 Detailed Description

```
template<typename T>
class gdcm::SimpleMemberCommand< T >
```

[Command](#) subclass that calls a pointer to a member function.

[SimpleMemberCommand](#) calls a pointer to a member function with no arguments.

### 10.279.2 Member Typedef Documentation

#### 10.279.2.1 Self

```
template<typename T >
typedef SimpleMemberCommand gdcm::SimpleMemberCommand< T >::Self
```

Standard class typedefs.

#### 10.279.2.2 TMemberFunctionPointer

```
template<typename T >
typedef void(T::* gdcm::SimpleMemberCommand< T >::TMemberFunctionPointer) ()
```

A method callback.

### 10.279.3 Constructor & Destructor Documentation

### 10.279.3.1 SimpleMemberCommand() [1/2]

```
template<typename T >
gdcm::SimpleMemberCommand< T >::SimpleMemberCommand (
    const Self & ) [delete]
```

### 10.279.3.2 SimpleMemberCommand() [2/2]

```
template<typename T >
gdcm::SimpleMemberCommand< T >::SimpleMemberCommand ( ) [inline], [protected]
```

Referenced by [gdcm::SimpleMemberCommand< T >::New\(\)](#).

### 10.279.3.3 ~SimpleMemberCommand()

```
template<typename T >
gdcm::SimpleMemberCommand< T >::~~SimpleMemberCommand ( ) [override], [protected], [default]
```

## 10.279.4 Member Function Documentation

### 10.279.4.1 Execute() [1/2]

```
template<typename T >
void gdcm::SimpleMemberCommand< T >::Execute (
    const Subject * caller,
    const Event & event ) [inline], [override], [virtual]
```

Abstract method that defines the action to be taken by the command. This variant is expected to be used when requests comes from a [const Object](#)

Implements [gdcm::Command](#).

References [gdcm::SimpleMemberCommand< T >::m\\_MemberFunction](#).

#### 10.279.4.2 Execute() [2/2]

```
template<typename T >
void gdcM::SimpleMemberCommand< T >::Execute (
    Subject * ,
    const Event & ) [inline], [override], [virtual]
```

Invoke the callback function.

Implements [gdcM::Command](#).

References [gdcM::SimpleMemberCommand< T >::m\\_MemberFunction](#).

#### 10.279.4.3 New()

```
template<typename T >
static SmartPointer< SimpleMemberCommand > gdcM::SimpleMemberCommand< T >::New ( ) [inline],
[static]
```

Run-time type information (and related methods). Method for creation through the object factory.

References [gdcM::SimpleMemberCommand< T >::SimpleMemberCommand\(\)](#).

#### 10.279.4.4 operator=()

```
template<typename T >
void gdcM::SimpleMemberCommand< T >::operator= (
    const Self & ) [delete]
```

#### 10.279.4.5 SetCallbackFunction()

```
template<typename T >
void gdcM::SimpleMemberCommand< T >::SetCallbackFunction (
    T * object,
    TMemberFunctionPointer memberFunction ) [inline]
```

Specify the callback function.

References [gdcM::SimpleMemberCommand< T >::m\\_MemberFunction](#), and [gdcM::SimpleMemberCommand< T >::m\\_This](#).



## 10.279.5 Member Data Documentation

### 10.279.5.1 m\_MemberFunction

```
template<typename T >
TMemberFunctionPointer gdcm::SimpleMemberCommand< T >::m_MemberFunction [protected]
```

Referenced by [gdcm::SimpleMemberCommand< T >::Execute\(\)](#), and [gdcm::SimpleMemberCommand< T >::SetCallbackFunction\(\)](#).

### 10.279.5.2 m\_This

```
template<typename T >
T* gdcm::SimpleMemberCommand< T >::m_This [protected]
```

Referenced by [gdcm::SimpleMemberCommand< T >::SetCallbackFunction\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmCommand.h](#)

## 10.280 gdcm::SimpleSubjectWatcher Class Reference

[SimpleSubjectWatcher](#).

```
#include <gdcmSimpleSubjectWatcher.h>
```

### Public Member Functions

- [SimpleSubjectWatcher](#) (const [SimpleSubjectWatcher](#) &)=delete
- [SimpleSubjectWatcher](#) ([Subject](#) \*s, const char \*comment="")
- virtual [~SimpleSubjectWatcher](#) ()
- void [operator=](#) (const [SimpleSubjectWatcher](#) &)=delete

## Protected Member Functions

- virtual void [EndFilter](#) ()
- virtual void [ShowAbort](#) ()
- virtual void [ShowAnonymization](#) ([Subject](#) \*caller, const [Event](#) &evt)
- virtual void [ShowDataSet](#) ([Subject](#) \*caller, const [Event](#) &evt)
- virtual void [ShowDataSet](#) ([Subject](#) \*caller, const [Event](#) &evt)
- virtual void [ShowFileName](#) ([Subject](#) \*caller, const [Event](#) &evt)
- virtual void [ShowIteration](#) ()
- virtual void [ShowProgress](#) ([Subject](#) \*caller, const [Event](#) &evt)
- virtual void [StartFilter](#) ()
- void [TestAbortOff](#) ()
- void [TestAbortOn](#) ()

### 10.280.1 Detailed Description

[SimpleSubjectWatcher](#).

This is a typical [Subject](#) Watcher class. It will observe all events.

#### Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 10.280.2 Constructor & Destructor Documentation

#### 10.280.2.1 [SimpleSubjectWatcher\(\)](#) [1/2]

```
gdcM::SimpleSubjectWatcher::SimpleSubjectWatcher (
    Subject * s,
    const char * comment = "" )
```

#### 10.280.2.2 [~SimpleSubjectWatcher\(\)](#)

```
virtual gdcM::SimpleSubjectWatcher::~~SimpleSubjectWatcher ( ) [virtual]
```

### 10.280.2.3 SimpleSubjectWatcher() [2/2]

```
gdcm::SimpleSubjectWatcher::SimpleSubjectWatcher (
    const SimpleSubjectWatcher & ) [delete]
```

## 10.280.3 Member Function Documentation

### 10.280.3.1 EndFilter()

```
virtual void gdcm::SimpleSubjectWatcher::EndFilter ( ) [protected], [virtual]
```

### 10.280.3.2 operator=()

```
void gdcm::SimpleSubjectWatcher::operator= (
    const SimpleSubjectWatcher & ) [delete]
```

### 10.280.3.3 ShowAbort()

```
virtual void gdcm::SimpleSubjectWatcher::ShowAbort ( ) [protected], [virtual]
```

### 10.280.3.4 ShowAnonymization()

```
virtual void gdcm::SimpleSubjectWatcher::ShowAnonymization (
    Subject * caller,
    const Event & evt ) [protected], [virtual]
```

### 10.280.3.5 ShowData()

```
virtual void gdcm::SimpleSubjectWatcher::ShowData (
    Subject * caller,
    const Event & evt ) [protected], [virtual]
```

**10.280.3.6 ShowDataSet()**

```
virtual void gdcm::SimpleSubjectWatcher::ShowDataSet (
    Subject * caller,
    const Event & evt ) [protected], [virtual]
```

**10.280.3.7 ShowFileName()**

```
virtual void gdcm::SimpleSubjectWatcher::ShowFileName (
    Subject * caller,
    const Event & evt ) [protected], [virtual]
```

**Examples**

[SimpleScanner.cxx](#).

**10.280.3.8 ShowIteration()**

```
virtual void gdcm::SimpleSubjectWatcher::ShowIteration ( ) [protected], [virtual]
```

**10.280.3.9 ShowProgress()**

```
virtual void gdcm::SimpleSubjectWatcher::ShowProgress (
    Subject * caller,
    const Event & evt ) [protected], [virtual]
```

**10.280.3.10 StartFilter()**

```
virtual void gdcm::SimpleSubjectWatcher::StartFilter ( ) [protected], [virtual]
```

**10.280.3.11 TestAbortOff()**

```
void gdcm::SimpleSubjectWatcher::TestAbortOff ( ) [protected]
```

### 10.280.3.12 TestAbortOn()

```
void gdcm::SimpleSubjectWatcher::TestAbortOn ( ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmSimpleSubjectWatcher.h](#)

## 10.281 gdcm::MrProtocol::Slice Struct Reference

```
#include <gdcmMrProtocol.h>
```

Collaboration diagram for gdcm::MrProtocol::Slice:

### Public Attributes

- [Vector3 Normal](#)
- [Vector3 Position](#)

### 10.281.1 Member Data Documentation

#### 10.281.1.1 Normal

```
Vector3 gdcm::MrProtocol::Slice::Normal
```

#### 10.281.1.2 Position

```
Vector3 gdcm::MrProtocol::Slice::Position
```

The documentation for this struct was generated from the following file:

- [gdcmMrProtocol.h](#)

## 10.282 gdcm::MrProtocol::SliceArray Struct Reference

```
#include <gdcmMrProtocol.h>
```

Collaboration diagram for gdcm::MrProtocol::SliceArray:

## Public Attributes

- `std::vector< Slice > Slices`

## 10.282.1 Member Data Documentation

### 10.282.1.1 Slices

```
std::vector< Slice > gdcM::MrProtocol::SliceArray::Slices
```

The documentation for this struct was generated from the following file:

- [gdcMMrProtocol.h](#)

## 10.283 `gdcM::SmartPointer< ObjectType >` Class Template Reference

Class for Smart Pointer.

```
#include <gdcMSmartPointer.h>
```

Inheritance diagram for `gdcM::SmartPointer< ObjectType >`:

## Public Member Functions

- [SmartPointer](#) ()
- [SmartPointer](#) (const [SmartPointer](#)< ObjectType > &p)
- [SmartPointer](#) (ObjectType \*p)
- [SmartPointer](#) (ObjectType const &p)
- [~SmartPointer](#) ()
- ObjectType \* [GetPointer](#) () const  
*Explicit function to retrieve the pointer.*
- [operator ObjectType \\*](#) () const  
*Return pointer to object.*
- ObjectType & [operator\\*](#) () const
- ObjectType \* [operator->](#) () const  
*Overload operator ->*
- [SmartPointer](#) & [operator=](#) (ObjectType \*r)  
*Overload operator assignment.*
- [SmartPointer](#) & [operator=](#) (ObjectType const &r)
- [SmartPointer](#) & [operator=](#) ([SmartPointer](#) const &r)  
*Overload operator assignment.*

### 10.283.1 Detailed Description

```
template<class ObjectType>
class gdcm::SmartPointer< ObjectType >
```

Class for Smart Pointer.

Will only work for subclass of [gdcm::Object](#) See `tr1/shared_ptr` for a more general approach (not invasive) `#include <tr1/memory>` { `shared_ptr<Bla> b(new Bla);` }

#### Note

Class partly based on post by Bill Hubauer: <http://groups.google.com/group/comp.lang.c++.msg/173ddc38a827a930>

#### See also

<http://www.davethehat.com/articles/smartp.htm>

and `itk::SmartPointer`

#### Examples

[CStoreQtProgress.cxx](#), [ChangeSequenceUltrasound.cxx](#), [DumpGEMSMovieGroup.cxx](#), [DumpPhilipsECHO.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), [DumpVisusChange.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream.cxx](#), [FixBrokenJ2K.cxx](#), [GenAllIVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [SimpleScanner.cxx](#), [gdcmrtnionplan.cxx](#), and [gdcmrtpplan.cxx](#).

### 10.283.2 Constructor & Destructor Documentation

#### 10.283.2.1 SmartPointer() [1/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer ( ) [inline]
```

#### 10.283.2.2 SmartPointer() [2/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer (
    const SmartPointer< ObjectType > & p ) [inline]
```

### 10.283.2.3 SmartPointer() [3/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer (
    ObjectType * p ) [inline]
```

### 10.283.2.4 SmartPointer() [4/4]

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::SmartPointer (
    ObjectType const & p ) [inline]
```

### 10.283.2.5 ~SmartPointer()

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::~~SmartPointer ( ) [inline]
```

## 10.283.3 Member Function Documentation

### 10.283.3.1 GetPointer()

```
template<class ObjectType >
ObjectType * gdcm::SmartPointer< ObjectType >::GetPointer ( ) const [inline]
```

Explicit function to retrieve the pointer.

### 10.283.3.2 operator ObjectType \*()

```
template<class ObjectType >
gdcm::SmartPointer< ObjectType >::operator ObjectType * ( ) const [inline]
```

Return pointer to object.



### 10.283.3.3 operator\*()

```
template<class ObjectType >
ObjectType & gdcmm::SmartPointer< ObjectType >::operator* ( ) const [inline]
```

### 10.283.3.4 operator->()

```
template<class ObjectType >
ObjectType * gdcmm::SmartPointer< ObjectType >::operator-> ( ) const [inline]
```

Overload operator ->

### 10.283.3.5 operator=( ) [1/3]

```
template<class ObjectType >
SmartPointer & gdcmm::SmartPointer< ObjectType >::operator= (
    ObjectType * r ) [inline]
```

Overload operator assignment.

### 10.283.3.6 operator=( ) [2/3]

```
template<class ObjectType >
SmartPointer & gdcmm::SmartPointer< ObjectType >::operator= (
    ObjectType const & r ) [inline]
```

References [gdcmm::SmartPointer< ObjectType >::operator=\( \)](#).

### 10.283.3.7 operator=( ) [3/3]

```
template<class ObjectType >
SmartPointer & gdcmm::SmartPointer< ObjectType >::operator= (
    SmartPointer< ObjectType > const & r ) [inline]
```

Overload operator assignment.

References [gdcmm::SmartPointer< ObjectType >::operator=\( \)](#).

Referenced by [gdcmm::SmartPointer< ObjectType >::operator=\( \)](#).

The documentation for this class was generated from the following files:

- [gdcmmObject.h](#)
- [gdcmmSmartPointer.h](#)

## 10.284 gdcm::network::SOPClassExtendedNegociationSub Class Reference

[SOPClassExtendedNegociationSub.](#)

```
#include <gdcmSOPClassExtendedNegociationSub.h>
```

### Public Member Functions

- [SOPClassExtendedNegociationSub](#) ()
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetTuple](#) (const char \*uid, uint8\_t levelofsupport=3, uint8\_t levelofdignalsig=0, uint8\_t elementcoercion=2)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.284.1 Detailed Description

[SOPClassExtendedNegociationSub.](#)

PS 3.7 [Table](#) D.3-11 SOP CLASS EXTENDED NEGOTIATION SUB-ITEM FIELDS (A-ASSOCIATE-RQ and A-↔ ASSOCIATE-AC)

### 10.284.2 Constructor & Destructor Documentation

#### 10.284.2.1 SOPClassExtendedNegociationSub()

```
gdcm::network::SOPClassExtendedNegociationSub::SOPClassExtendedNegociationSub ( )
```

### 10.284.3 Member Function Documentation

#### 10.284.3.1 Print()

```
void gdcm::network::SOPClassExtendedNegociationSub::Print (
    std::ostream & os ) const
```

### 10.284.3.2 Read()

```
std::istream & gdcm::network::SOPClassExtendedNegociationSub::Read (
    std::istream & is )
```

### 10.284.3.3 SetTuple()

```
void gdcm::network::SOPClassExtendedNegociationSub::SetTuple (
    const char * uid,
    uint8_t levelofsupport = 3,
    uint8_t levelofdigitalsig = 0,
    uint8_t elementcoercion = 2 )
```

### 10.284.3.4 Size()

```
size_t gdcm::network::SOPClassExtendedNegociationSub::Size ( ) const
```

### 10.284.3.5 Write()

```
const std::ostream & gdcm::network::SOPClassExtendedNegociationSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmSOPClassExtendedNegociationSub.h](#)

## 10.285 gdcm::SOPClassUIDToIOD Class Reference

Class convert a class SOP Class UID into IOD.

```
#include <gdcmSOPClassUIDToIOD.h>
```

### Public Types

- typedef const char \* [const](#)(SOPClassUIDToIODType)[2]

## Static Public Member Functions

- static `const char *` [GetIOD](#) (`UIDs const &uid`)
- static `const char *` [GetIODFromSOPClassUID](#) (`const char *sopclassuid`)
- static unsigned int [GetNumberOfSOPClassToIOD](#) ()  
*Return the number of SOP Class UID listed internally.*
- static `const char *` [GetSOPClassUIDFromIOD](#) (`const char *iod`)
- static `SOPClassUIDToIODType &` [GetSOPClassUIDToIOD](#) (unsigned int i)
- static `SOPClassUIDToIODType *` [GetSOPClassUIDToIODs](#) ()

### 10.285.1 Detailed Description

Class convert a class SOP Class UID into [IOD](#).

Reference PS 3.4 [Table B.5-1](#) STANDARD SOP CLASSES

### 10.285.2 Member Typedef Documentation

#### 10.285.2.1 `const`

```
typedef const char * gdcM::SOPClassUIDToIOD::const (SOPClassUIDToIODType) [2]
```

### 10.285.3 Member Function Documentation

#### 10.285.3.1 `GetIOD()`

```
static const char * gdcM::SOPClassUIDToIOD::GetIOD (  
    UIDs const & uid ) [static]
```

Return the associated [IOD](#) based on a SOP Class UID uid (there is a one-to-one mapping from SOP Class UID to matching [IOD](#))

#### Examples

[GenerateStandardSOPClasses.cxx](#).

### 10.285.3.2 GetIODFromSOPClassUID()

```
static const char * gdcm::SOPClassUIDToIOD::GetIODFromSOPClassUID (
    const char * sopclassuid ) [static]
```

### 10.285.3.3 GetNumberOfSOPClassToIOD()

```
static unsigned int gdcm::SOPClassUIDToIOD::GetNumberOfSOPClassToIOD ( ) [static]
```

Return the number of SOP Class UID listed internally.

### 10.285.3.4 GetSOPClassUIDFromIOD()

```
static const char * gdcm::SOPClassUIDToIOD::GetSOPClassUIDFromIOD (
    const char * iod ) [static]
```

### 10.285.3.5 GetSOPClassUIDToIOD()

```
static SOPClassUIDToIODType & gdcm::SOPClassUIDToIOD::GetSOPClassUIDToIOD (
    unsigned int i ) [static]
```

### 10.285.3.6 GetSOPClassUIDToIODs()

```
static SOPClassUIDToIODType * gdcm::SOPClassUIDToIOD::GetSOPClassUIDToIODs ( ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmSOPClassUIDToIOD.h](#)

## 10.286 gdcm::Sorter Class Reference

[Sorter](#).

```
#include <gdcmSorter.h>
```

Inheritance diagram for gdcm::Sorter:

Collaboration diagram for gdcm::Sorter:

## Public Types

- typedef bool(\* [SortFunction](#)) ([DataSet](#) const &, [DataSet](#) const &)  
*Set the sort function which compares one dataset to the other.*

## Public Member Functions

- [Sorter](#) ()
- virtual [~Sorter](#) ()
- bool [AddSelect](#) ([Tag](#) const &tag, const char \*value)  
*UNSUPPORTED FOR NOW.*
- const std::vector< std::string > & [GetFileNames](#) () const
- void [Print](#) (std::ostream &os) const  
*Print.*
- void [SetSortFunction](#) ([SortFunction](#) f)
- void [SetTagsToRead](#) (std::set< [Tag](#) > const &tags)
- virtual bool [Sort](#) (std::vector< std::string > const &filenames)  
*Typically the output of [Directory::GetFileNames\(\)](#)*
- virtual bool [StableSort](#) (std::vector< std::string > const &filenames)

## Protected Types

- typedef std::map< [Tag](#), std::string > [SelectionMap](#)

## Protected Attributes

- std::vector< std::string > [FileNames](#)
- std::map< [Tag](#), std::string > [Selection](#)
- [SortFunction](#) [SortFunc](#)
- std::set< [Tag](#) > [TagsToRead](#)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Sorter](#) &s)

### 10.286.1 Detailed Description

[Sorter](#).

General class to do sorting using a custom function You simply need to provide a function of type: [Sorter::SortFunction](#)

#### Warning

implementation details. For now there is no cache mechanism. Which means that every time you call Sort, all files specified as input parameter are *read*

See also

[Scanner](#)

Examples

[SortImage.cxx](#), [SortImage2.cs](#), and [VolumeSorter.cxx](#).

## 10.286.2 Member Typedef Documentation

### 10.286.2.1 SelectionMap

```
typedef std::map<Tag, std::string> gdcm::Sorter::SelectionMap [protected]
```

### 10.286.2.2 SortFunction

```
typedef bool(* gdcm::Sorter::SortFunction) (DataSet const &, DataSet const &)
```

Set the sort function which compares one dataset to the other.

## 10.286.3 Constructor & Destructor Documentation

### 10.286.3.1 Sorter()

```
gdcm::Sorter::Sorter ( )
```

### 10.286.3.2 ~Sorter()

```
virtual gdcm::Sorter::~Sorter ( ) [virtual]
```

## 10.286.4 Member Function Documentation

### 10.286.4.1 AddSelect()

```
bool gdcm::Sorter::AddSelect (
    Tag const & tag,
    const char * value )
```

UNSUPPORTED FOR NOW.

#### 10.286.4.2 GetFilenames()

```
const std::vector< std::string > & gdcM::Sorter::GetFilenames ( ) const [inline]
```

Return the list of filenames as sorted by the specific algorithm used. Empty by default (before [Sort\(\)](#) is called)

##### Examples

[Compute3DSpacing.cxx](#), [SortImage.cxx](#), [VolumeSorter.cxx](#), [gdcMOrthoplanes.cxx](#), and [reslicesphere.cxx](#).

#### 10.286.4.3 Print()

```
void gdcM::Sorter::Print (
    std::ostream & os ) const
```

Print.

##### Examples

[SortImage.cxx](#), [VolumeSorter.cxx](#), and [gdcMOrthoplanes.cxx](#).

#### 10.286.4.4 SetSortFunction()

```
void gdcM::Sorter::SetSortFunction (
    SortFunction f )
```

##### Examples

[SortImage.cxx](#), [SortImage2.cs](#), and [VolumeSorter.cxx](#).

#### 10.286.4.5 SetTagsToRead()

```
void gdcM::Sorter::SetTagsToRead (
    std::set< Tag > const & tags )
```

Specify a set of tags to be read in during the sort procedure. By default this set is empty, in which case the entire image, including pixel data, is read in.



#### 10.286.4.6 Sort()

```
virtual bool gdcm::Sorter::Sort (
    std::vector< std::string > const & filenames ) [virtual]
```

Typically the output of [Directory::GetFilenames\(\)](#)

Reimplemented in [gdcm::IPPSorter](#).

##### Examples

[SortImage.cxx](#).

#### 10.286.4.7 StableSort()

```
virtual bool gdcm::Sorter::StableSort (
    std::vector< std::string > const & filenames ) [virtual]
```

##### Examples

[SortImage.cxx](#), and [VolumeSorter.cxx](#).

### 10.286.5 Friends And Related Function Documentation

#### 10.286.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Sorter & s ) [friend]
```

### 10.286.6 Member Data Documentation

#### 10.286.6.1 Filenames

```
std::vector<std::string> gdcm::Sorter::Filenames [protected]
```

### 10.286.6.2 Selection

```
std::map<Tag, std::string> gdcm::Sorter::Selection [protected]
```

### 10.286.6.3 SortFunc

```
SortFunction gdcm::Sorter::SortFunc [protected]
```

### 10.286.6.4 TagsToRead

```
std::set<Tag> gdcm::Sorter::TagsToRead [protected]
```

The documentation for this class was generated from the following file:

- [gdcmSorter.h](#)

## 10.287 gdcm::Spacing Class Reference

Class for [Spacing](#).

```
#include <gdcmSpacing.h>
```

### Public Types

- enum [SpacingType](#) {  
    [DETECTOR](#) = 0 ,  
    [MAGNIFIED](#) ,  
    [CALIBRATED](#) ,  
    [UNKNOWN](#) }

### Public Member Functions

- [Spacing](#) ()
- [~Spacing](#) ()

### Static Public Member Functions

- static [Attribute](#)< 0x28, 0x34 > [ComputePixelAspectRatioFromPixelSpacing](#) (const [Attribute](#)< 0x28, 0x30 > &pixelspacing)

## 10.287.1 Detailed Description

Class for [Spacing](#).

It all began with a mail to WG6:

**Subject:** Imager Pixel [Spacing](#) vs Pixel [Spacing](#) **Body:** [Apologies for the duplicate post, namely to David Clunie & OFFIS team]

I have been trying to understand CP-586 in the following two cases:

On the one hand:

- DISCIMG/IMAGES/CRIMAGE taken from <http://dclunie.com/images/pixelspacingtestimages.zip>

And on the other hand:

- [http://gdcm.sourceforge.net/thingies/cr\\_pixelspacing.dcm](http://gdcm.sourceforge.net/thingies/cr_pixelspacing.dcm)

If I understand correctly the CP, one is required to use Pixel [Spacing](#) for measurement ('true size' print) instead of Imager Pixel [Spacing](#), since the two attributes are present and Pixel [Spacing](#) is different from Imager Pixel [Spacing](#).

If this is correct, then the test data DISCIMG/IMAGES/CRIMAGE is incorrect. If this is incorrect (ie. I need to use Imager Pixel [Spacing](#)), then the display of cr\_pixelspacing.dcm for measurement will be incorrect.

Could someone please let me know what am I missing here? I could not find any information in any header that would allow me to differentiate those.

Thank you for your time,

Ref: <http://lists.nema.org/scripts/lyris.pl?sub=488573&id=400720477>

See PS 3.3-2008, [Table C.7-11b](#) IMAGE PIXEL MACRO ATTRIBUTES

Ratio of the vertical size and horizontal size of the pixels in the image specified by a pair of integer values where the first value is the vertical pixel size, and the second value is the horizontal pixel size. Required if the aspect ratio values do not have a ratio of 1:1 and the physical pixel spacing is not specified by Pixel [Spacing](#) (0028,0030), or Imager Pixel [Spacing](#) (0018,1164) or Nominal Scanned Pixel [Spacing](#) (0018,2010), either for the entire [Image](#) or per-frame in a Functional Group [Macro](#). See C.7.6.3.1.7.

PS 3.3-2008 10.7.1.3 Pixel [Spacing Value](#) Order and Valid Values All pixel spacing related attributes shall have non-zero values, except when there is only a single row or column or pixel of data present, in which case the corresponding value may be zero.

Ref: [http://gdcm.sourceforge.net/wiki/index.php/Imager\\_Pixel\\_Spacing](http://gdcm.sourceforge.net/wiki/index.php/Imager_Pixel_Spacing)

## 10.287.2 Member Enumeration Documentation

### 10.287.2.1 SpacingType

enum [gdcm::Spacing::SpacingType](#)

## Enumerator

DETECTOR	
MAGNIFIED	
CALIBRATED	
UNKNOWN	

**10.287.3 Constructor & Destructor Documentation****10.287.3.1 Spacing()**

```
gdcm::Spacing::Spacing ( )
```

**10.287.3.2 ~Spacing()**

```
gdcm::Spacing::~Spacing ( )
```

**10.287.4 Member Function Documentation****10.287.4.1 ComputePixelAspectRatioFromPixelSpacing()**

```
static Attribute< 0x28, 0x34 > gdcm::Spacing::ComputePixelAspectRatioFromPixelSpacing (
    const Attribute< 0x28, 0x30 > & pixelspacing ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmSpacing.h](#)

**10.288 gdcm::Spectroscopy Class Reference**

[Spectroscopy](#) class.

```
#include <gdcmSpectroscopy.h>
```

## Public Member Functions

- [Spectroscopy](#) ()=default

### 10.288.1 Detailed Description

[Spectroscopy](#) class.

### 10.288.2 Constructor & Destructor Documentation

#### 10.288.2.1 Spectroscopy()

```
gdcm::Spectroscopy::Spectroscopy ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmSpectroscopy.h](#)

## 10.289 gdcm::SplitMosaicFilter Class Reference

[SplitMosaicFilter](#) class.

```
#include <gdcmSplitMosaicFilter.h>
```

## Public Member Functions

- [SplitMosaicFilter](#) ()
- [~SplitMosaicFilter](#) ()
- bool [ComputeMOSAICDimensions](#) (unsigned int dims[3])
- bool [ComputeMOSAICSliceNormal](#) (double dims[3], bool &inverted)  
*Extract the value for SliceNormalVector (CSA header)*
- bool [ComputeMOSAICSlicePosition](#) (double pos[3], bool inverted)  
*Extract the value for ImagePositionPatient (requires inverted flag)*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- [Image](#) & [GetImage](#) ()
- const [Image](#) & [GetImage](#) () const
- void [SetFile](#) (const [File](#) &f)
- void [SetImage](#) (const [Image](#) &image)
- bool [Split](#) ()  
*Split the SIEMENS MOSAIC image.*

## Static Public Member Functions

- static bool [GetAcquisitionSize](#) (unsigned int size[2], [DataSet](#) const &ds)  
*Get the Acquisition Matrix (non zero value):*
- static unsigned int [GetNumberOfImagesInMosaic](#) ([File](#) const &file)  
*Return the value for NumberOfImagesInMosaic, or compute it from Acquisition Size.*

### 10.289.1 Detailed Description

[SplitMosaicFilter](#) class.

Class to reshuffle bytes for a SIEMENS Mosaic image Siemens CSA [Image](#) Header CSA:= Common Siemens Architecture, sometimes also known as Common syngo Architecture

#### Warning

when private attributes are not found, the acquisition matrix is used to compute the NumberOfImagesInMosaic. This means trailing black slices will be considered in the volume (instead of discarded). CSA 0029,1010 is needed for correct NumberOfImagesInMosaic CSA 0029,1020 is needed to compute the correct origin without above info default are taken (may not be accurate).

### 10.289.2 Constructor & Destructor Documentation

#### 10.289.2.1 [SplitMosaicFilter](#)()

```
gdcm::SplitMosaicFilter::SplitMosaicFilter ( )
```

#### 10.289.2.2 [~SplitMosaicFilter](#)()

```
gdcm::SplitMosaicFilter::~~SplitMosaicFilter ( )
```

### 10.289.3 Member Function Documentation

#### 10.289.3.1 [ComputeMOSAICDimensions](#)()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICDimensions (
    unsigned int dims[3] )
```

Compute the new dimensions according to private information stored in the MOSAIC header.

### 10.289.3.2 ComputeMOSAICSliceNormal()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICSliceNormal (
    double dims[3],
    bool & inverted )
```

Extract the value for SliceNormalVector (CSA header)

### 10.289.3.3 ComputeMOSAICSlicePosition()

```
bool gdcm::SplitMosaicFilter::ComputeMOSAICSlicePosition (
    double pos[3],
    bool inverted )
```

Extract the value for ImagePositionPatient (requires inverted flag)

### 10.289.3.4 GetAcquisitionSize()

```
static bool gdcm::SplitMosaicFilter::GetAcquisitionSize (
    unsigned int size[2],
    DataSet const & ds ) [static]
```

Get the Acquisition Matrix (non zero value):

### 10.289.3.5 GetFile() [1/2]

```
File & gdcm::SplitMosaicFilter::GetFile ( ) [inline]
```

### 10.289.3.6 GetFile() [2/2]

```
const File & gdcm::SplitMosaicFilter::GetFile ( ) const [inline]
```

### 10.289.3.7 GetImage() [1/2]

```
Image & gdcm::SplitMosaicFilter::GetImage ( ) [inline]
```

### 10.289.3.8 GetImage() [2/2]

```
const Image & gdcM::SplitMosaicFilter::GetImage ( ) const [inline]
```

### 10.289.3.9 GetNumberOfImagesInMosaic()

```
static unsigned int gdcM::SplitMosaicFilter::GetNumberOfImagesInMosaic (
    File const & file ) [static]
```

Return the value for NumberOfImagesInMosaic, or compute it from Acquisition Size.

### 10.289.3.10 SetFile()

```
void gdcM::SplitMosaicFilter::SetFile (
    const File & f ) [inline]
```

### 10.289.3.11 SetImage()

```
void gdcM::SplitMosaicFilter::SetImage (
    const Image & image )
```

### 10.289.3.12 Split()

```
bool gdcM::SplitMosaicFilter::Split ( )
```

Split the SIEMENS MOSAIC image.

The documentation for this class was generated from the following file:

- [gdcMSplitMosaicFilter.h](#)

## 10.290 gdcM::StartEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::StartEvent:

Collaboration diagram for gdcM::StartEvent:



## Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcmEvent.h](#)

## 10.291 `gdcm::static_assert_test< x >` Struct Template Reference

```
#include <gdcmStaticAssert.h>
```

The documentation for this struct was generated from the following file:

- [gdcmStaticAssert.h](#)

## 10.292 `gdcm::STATIC_ASSERTION_FAILURE< x >` Struct Template Reference

The documentation for this struct was generated from the following file:

- [gdcmStaticAssert.h](#)

## 10.293 `gdcm::STATIC_ASSERTION_FAILURE< true >` Struct Reference

```
#include <gdcmStaticAssert.h>
```

### Public Types

- enum { `value` = 1 }

### 10.293.1 Member Enumeration Documentation

#### 10.293.1.1 anonymous enum

```
anonymous enum
```

## Enumerator

value	
-------	--

The documentation for this struct was generated from the following file:

- [gdcmStaticAssert.h](#)

## 10.294 gdcm::StreamImageReader Class Reference

[StreamImageReader](#).

```
#include <gdcmStreamImageReader.h>
```

### Public Member Functions

- [StreamImageReader](#) ()
- virtual [~StreamImageReader](#) ()
- bool [CanReadImage](#) () const
- void [DefinePixelExtent](#) (uint16\_t inXMin, uint16\_t inXMax, uint16\_t inYMin, uint16\_t inYMax, uint16\_t inZMin=0, uint16\_t inZMax=1)
- uint32\_t [DefineProperBufferLength](#) () const
- std::vector< unsigned int > [GetDimensionsValueForResolution](#) (unsigned int)
- [File](#) const & [GetFile](#) () const
- bool [Read](#) (char \*inReadBuffer, const std::size\_t &inBufferLength)
- virtual bool [ReadImageInformation](#) ()
- void [SetFileName](#) (const char \*inFileName)
- void [SetStream](#) (std::istream &inStream)

### 10.294.1 Detailed Description

[StreamImageReader](#).

#### Note

its role is to convert the DICOM [DataSet](#) into a [Image](#) representation via an ITK streaming (ie, multithreaded) interface [Image](#) is different from [Pixmap](#) has it has a position and a direction in Space. Currently, this class is thread safe in that it can read a single extent in a single thread. Multiple versions can be used for multiple extents/threads.

#### See also

[Image](#)

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

## 10.294.2 Constructor & Destructor Documentation

### 10.294.2.1 StreamImageReader()

```
gdcm::StreamImageReader::StreamImageReader ( )
```

### 10.294.2.2 ~StreamImageReader()

```
virtual gdcm::StreamImageReader::~~StreamImageReader ( ) [virtual]
```

## 10.294.3 Member Function Documentation

### 10.294.3.1 CanReadImage()

```
bool gdcm::StreamImageReader::CanReadImage ( ) const
```

Only RAW images are currently readable by the stream reader. As more streaming codecs are added, then this function will be updated to reflect those changes. Calling this function prior to reading will ensure that only streamable files are streamed. Make sure to call ReadImageInformation prior to calling this function.

#### Examples

[StreamImageReaderTest.cxx](#).

### 10.294.3.2 DefinePixelExtent()

```
void gdcm::StreamImageReader::DefinePixelExtent (
    uint16_t inXMin,
    uint16_t inXMax,
    uint16_t inYMin,
    uint16_t inYMax,
    uint16_t inZMin = 0,
    uint16_t inZMax = 1 )
```

Defines an image extent for the Read function. DICOM states that an image can have no more than  $2^{16}$  pixels per edge (as of 2009) In this case, the pixel extents ignore the direction cosines entirely, and assumes that the origin of the image is at location 0,0 (regardless of the definition in space per the tags). So, if the first 100 pixels of the first row are to be read in, this function should be called with DefinePixelExtent(0, 100, 0, 1), regardless of pixel size or orientation.

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 10.294.3.3 DefineProperBufferLength()

```
uint32_t gdcm::StreamImageReader::DefineProperBufferLength ( ) const
```

Paying attention to the pixel format and so forth, define the proper buffer length for the user. The return amount is in bytes. Call this function to determine the size of the char\* buffer that will need to be passed in to ReadImageSubregion(). If the return is 0, then that means that the pixel extent was not defined prior

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 10.294.3.4 GetDimensionsValueForResolution()

```
std::vector< unsigned int > gdcm::StreamImageReader::GetDimensionsValueForResolution (
    unsigned int )
```

### 10.294.3.5 GetFile()

```
File const & gdcm::StreamImageReader::GetFile ( ) const
```

Returns the dataset read by ReadImageInformation Couple this with the [ImageHelper](#) to get statistics about the image, like pixel extent, to be able to initialize buffers for reading

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 10.294.3.6 Read()

```
bool gdcm::StreamImageReader::Read (
    char * inReadBuffer,
    const std::size_t & inBufferLength )
```

Read the DICOM image. There are three reasons for failure:

1. The extent is not set
2. the conversion from char\* to std::ostream (internally) fails
3. the given buffer isn't large enough to accommodate the desired pixel extent. This method has been implemented to look similar to the metaimageio in itk MUST have an extent defined, or else Read will return false. If no particular extent is required, use [ImageReader](#) instead.

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 10.294.3.7 ReadImageInformation()

```
virtual bool gdcm::StreamImageReader::ReadImageInformation ( ) [virtual]
```

Set the spacing and dimension information for the set filename. returns false if the file is not initialized or not an image, with the pixel (7fe0,0010) tag.

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 10.294.3.8 SetFileName()

```
void gdcm::StreamImageReader::SetFileName (
    const char * inFileName )
```

One of either SetFileName or SetStream must be called prior to any other functions. These initialize an internal [Reader](#) class to be able to get non-pixel image information.

#### Examples

[ExtractOneFrame.cs](#), and [StreamImageReaderTest.cxx](#).

### 10.294.3.9 SetStream()

```
void gdcm::StreamImageReader::SetStream (
    std::istream & inStream )
```

The documentation for this class was generated from the following file:

- [gdcmStreamImageReader.h](#)

## 10.295 gdcm::StreamImageWriter Class Reference

[StreamImageReader](#).

```
#include <gdcmStreamImageWriter.h>
```

Collaboration diagram for gdcm::StreamImageWriter:

## Public Member Functions

- [StreamImageWriter](#) ()
- virtual [~StreamImageWriter](#) ()
- bool [CanWriteFile](#) () const
- void [DefinePixelExtent](#) (uint16\_t inXMin, uint16\_t inXMax, uint16\_t inYMin, uint16\_t inYMax, uint16\_t inZMin=0, uint16\_t inZMax=1)
- uint32\_t [DefineProperBufferLength](#) ()
- void [SetFile](#) (const [File](#) &inFile)
- void [SetFileName](#) (const char \*inFileName)
- void [SetStream](#) (std::ostream &inStream)
- bool [Write](#) (void \*inWriteBuffer, const std::size\_t &inBufferLength)
- virtual bool [WriteImageInformation](#) ()

## Protected Member Functions

- virtual bool [WriteImageSubregionRAW](#) (char \*inWriteBuffer, const std::size\_t &inBufferLength)
- int [WriteRawHeader](#) ([RAWCodec](#) \*inCodec, std::ostream \*inStream)

## Protected Attributes

- int [mElementOffsets](#)
- int [mElementOffsets1](#)
- [SmartPointer](#)< [File](#) > [mspFile](#)
- [Writer](#) [mWriter](#)
- uint16\_t [mXMax](#)
- uint16\_t [mXMin](#)
- uint16\_t [mYMax](#)
- uint16\_t [mYMin](#)
- uint16\_t [mZMax](#)
- uint16\_t [mZMin](#)

## 10.295.1 Detailed Description

[StreamImageReader](#).

### Note

its role is to convert the DICOM [DataSet](#) into a [Image](#) representation via an ITK streaming (ie, multithreaded) interface [Image](#) is different from [Pixmap](#) has it has a position and a direction in Space. Currently, this class is threadsafe in that it can read a single extent in a single thread. Multiple versions can be used for multiple extents/threads.

### See also

[Image](#)

### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

## 10.295.2 Constructor & Destructor Documentation

### 10.295.2.1 StreamImageWriter()

```
gdcm::StreamImageWriter::StreamImageWriter ( )
```

### 10.295.2.2 ~StreamImageWriter()

```
virtual gdcm::StreamImageWriter::~~StreamImageWriter ( ) [virtual]
```

## 10.295.3 Member Function Documentation

### 10.295.3.1 CanWriteFile()

```
bool gdcm::StreamImageWriter::CanWriteFile ( ) const
```

This function determines if a file can even be written using the streaming writer unlike the reader, can be called before WriteImageInformation, but must be called after SetFile.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), and [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#).

### 10.295.3.2 DefinePixelExtent()

```
void gdcm::StreamImageWriter::DefinePixelExtent (
    uint16_t inXMin,
    uint16_t inXMax,
    uint16_t inYMin,
    uint16_t inYMax,
    uint16_t inZMin = 0,
    uint16_t inZMax = 1 )
```

Defines an image extent for the Read function. DICOM states that an image can have no more than  $2^{16}$  pixels per edge (as of 2009) In this case, the pixel extents ignore the direction cosines entirely, and assumes that the origin of the image is at location 0,0 (regardless of the definition in space per the tags). So, if the first 100 pixels of the first row are to be read in, this function should be called with DefinePixelExtent(0, 100, 0, 1), regardless of pixel size or orientation. 15 nov 2010: added z dimension, defaults to being 1 plane large

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.295.3.3 DefineProperBufferLength()

```
uint32_t gdcm::StreamImageWriter::DefineProperBufferLength ( )
```

Paying attention to the pixel format and so forth, define the proper buffer length for the user. The return amount is in bytes. If the return is 0, then that means that the pixel extent was not defined prior this return is for RAW inputs which are then encoded by the writer, but are used to ensure that the writer gets the proper buffer size

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.295.3.4 SetFile()

```
void gdcm::StreamImageWriter::SetFile (
    const File & inFile )
```

Set the image information to be written to disk that is everything but the pixel information: (7fe0,0010) PixelData

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.295.3.5 SetFileName()

```
void gdcm::StreamImageWriter::SetFileName (
    const char * inFileName )
```

One of either SetFileName or SetStream must be called prior to any other functions. These initialize an internal [Reader](#) class to be able to get non-pixel image information.

### 10.295.3.6 SetStream()

```
void gdcm::StreamImageWriter::SetStream (
    std::ostream & inStream )
```

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).



### 10.295.3.7 Write()

```
bool gdcm::StreamImageWriter::Write (
    void * inWriteBuffer,
    const std::size_t & inBufferLength )
```

Read the DICOM image. There are three reasons for failure:

1. The extent is not set
2. the conversion from void\* to std::ostream (internally) fails
3. the given buffer isn't large enough to accommodate the desired pixel extent. This method has been implemented to look similar to the `metainageio` in `itk` MUST have an extent defined, or else `Read` will return false. If no particular extent is required, use [ImageReader](#) instead.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.295.3.8 WriteImageInformation()

```
virtual bool gdcm::StreamImageWriter::WriteImageInformation ( ) [virtual]
```

Write the header information to disk, and a bunch of zeros for the actual pixel information. Of course, if we're doing a non-compressed format, that works but if it's compressed, we have to force the ordering of chunks that are written.

#### Examples

[Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.295.3.9 WriteImageSubregionRAW()

```
virtual bool gdcm::StreamImageWriter::WriteImageSubregionRAW (
    char * inWriteBuffer,
    const std::size_t & inBufferLength ) [protected], [virtual]
```

Using the min, max, etc set by `DefinePixelExtent`, this will fill the given buffer. Make sure to call `DefinePixelExtent` and to initialize the buffer with the amount given by `DefineProperBufferLength` prior to calling this. reads by the RAW codec; other codecs are added once implemented

### 10.295.3.10 WriteRawHeader()

```
int gdcm::StreamImageWriter::WriteRawHeader (
    RAWCodec * inCodec,
    std::ostream * inStream ) [protected]
```

when writing a raw file, we know the full extent, and can just write the first 12 bytes out (the tag, the [VR](#), and the size) when we do compressed files, we'll do it in chunks, as described in 2009-3, part 5, Annex A, section 4. Pass the raw codec so that in the rare case of a bigendian explicit raw, the first 12 bytes written out should still be kosher. returns -1 if there's any failure, or the complete offset (12 bytes) if it works. Those 12 bytes are then added to the position in order to determine where to write.

## 10.295.4 Member Data Documentation

### 10.295.4.1 mElementOffsets

```
int gdcm::StreamImageWriter::mElementOffsets [protected]
```

The result of WriteRawHeader (or another header, when that's implemented) This result is saved so that the first N bytes aren't constantly being rewritten for each chunk that's passed in. For compressed data, the offset table will require rewrites of data.

### 10.295.4.2 mElementOffsets1

```
int gdcm::StreamImageWriter::mElementOffsets1 [protected]
```

### 10.295.4.3 mspFile

```
SmartPointer<File> gdcm::StreamImageWriter::mspFile [protected]
```

### 10.295.4.4 mWriter

```
Writer gdcm::StreamImageWriter::mWriter [protected]
```

#### 10.295.4.5 mXMax

uint16\_t gdcm::StreamImageWriter::mXMax [protected]

#### 10.295.4.6 mXMin

uint16\_t gdcm::StreamImageWriter::mXMin [protected]

#### 10.295.4.7 mYMax

uint16\_t gdcm::StreamImageWriter::mYMax [protected]

#### 10.295.4.8 mYMin

uint16\_t gdcm::StreamImageWriter::mYMin [protected]

#### 10.295.4.9 mZMax

uint16\_t gdcm::StreamImageWriter::mZMax [protected]

#### 10.295.4.10 mZMin

uint16\_t gdcm::StreamImageWriter::mZMin [protected]

The documentation for this class was generated from the following file:

- [gdcmStreamImageWriter.h](#)

## 10.296 gdcm::StrictScanner Class Reference

[StrictScanner](#).

```
#include <gdcmStrictScanner.h>
```

Inheritance diagram for gdcm::StrictScanner:

Collaboration diagram for gdcm::StrictScanner:

### Classes

- struct [ltstr](#)

### Public Types

- typedef MappingType::const\_iterator [ConstIterator](#)
- typedef std::map< const char \*, [TagToValue](#), [ltstr](#) > [MappingType](#)
- typedef std::map< [Tag](#), const char \* > [TagToValue](#)
- typedef TagToValue::value\_type [TagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

### Public Member Functions

- [StrictScanner](#) ()
- [~StrictScanner](#) () override
- void [AddPrivateTag](#) ([PrivateTag](#) const &t)
- void [AddSkipTag](#) ([Tag](#) const &t)
 

*Add a tag that will need to be skipped. Those are root level skip tags.*
- void [AddTag](#) ([Tag](#) const &t)
 

*Add a tag that will need to be read. Those are root level skip tags.*
- [ConstIterator](#) [Begin](#) () const
- void [ClearSkipTags](#) ()
- void [ClearTags](#) ()
- [ConstIterator](#) [End](#) () const
- [Directory::FilenameType](#) [GetAllFileNamesFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FilenameType](#) const & [GetFileNames](#) () const
- [Directory::FilenameType](#) [GetKeys](#) () const
- [TagToValue](#) const & [GetMapping](#) (const char \*filename) const
 

*Get the std::map mapping filenames to value for file 'filename'.*
- [TagToValue](#) const & [GetMappingFromTagToValue](#) ([Tag](#) const &t, const char \*value) const
 

*See [GetFilenameFromTagToValue\(\)](#). This is simply [GetFilenameFromTagToValue](#) followed.*
- [MappingType](#) const & [GetMappings](#) () const
 

*Mappings are the mapping from a particular tag to the map, mapping filename to value:*
- [Directory::FilenameType](#) [GetOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetValue](#) (const char \*filename, [Tag](#) const &t) const

- [ValueType](#) const & [GetValues](#) () const  
*Get all the values found (in lexicographic order)*
- [ValueType](#) [GetValues](#) ([Tag](#) const &t) const  
*Get all the values found (in lexicographic order) associated with [Tag](#) 't'.*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override  
*Print result.*
- void [PrintTable](#) (std::ostream &os) const
- bool [Scan](#) ([Directory::FileNamesType](#) const &filenames)  
*Start the scan !*

## Static Public Member Functions

- static [SmartPointer](#)< [StrictScanner](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [StrictScanner](#) &s)

## 10.296.1 Detailed Description

[StrictScanner](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

### Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

## 10.296.2 Member Typedef Documentation

### 10.296.2.1 ConstIterator

```
typedef MappingType::const_iterator gdc::StrictScanner::ConstIterator
```

### 10.296.2.2 MappingType

```
typedef std::map<const char *, TagToValue, ltstr> gdc::StrictScanner::MappingType
```

### 10.296.2.3 TagToValue

```
typedef std::map<Tag, const char*> gdc::StrictScanner::TagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (hold in a std::vector) this avoid an extra copy of the byte array. Tag are used as Tag class since sizeof(tag) <= sizeof(pointer)

### 10.296.2.4 TagToValueValueType

```
typedef TagToValue::value_type gdc::StrictScanner::TagToValueValueType
```

### 10.296.2.5 ValuesType

```
typedef std::set< std::string > gdc::StrictScanner::ValuesType
```

## 10.296.3 Constructor & Destructor Documentation

### 10.296.3.1 StrictScanner()

```
gdc::StrictScanner::StrictScanner ( ) [inline]
```

### 10.296.3.2 ~StrictScanner()

```
gdcm::StrictScanner::~StrictScanner ( ) [override]
```

## 10.296.4 Member Function Documentation

### 10.296.4.1 AddPrivateTag()

```
void gdcm::StrictScanner::AddPrivateTag (
    PrivateTag const & t )
```

### 10.296.4.2 AddSkipTag()

```
void gdcm::StrictScanner::AddSkipTag (
    Tag const & t )
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 10.296.4.3 AddTag()

```
void gdcm::StrictScanner::AddTag (
    Tag const & t )
```

Add a tag that will need to be read. Those are root level skip tags.

#### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 10.296.4.4 Begin()

```
ConstIterator gdcm::StrictScanner::Begin ( ) const [inline]
```

#### 10.296.4.5 ClearSkipTags()

```
void gdcmm::StrictScanner::ClearSkipTags ( )
```

#### 10.296.4.6 ClearTags()

```
void gdcmm::StrictScanner::ClearTags ( )
```

#### 10.296.4.7 End()

```
ConstIterator gdcmm::StrictScanner::End ( ) const [inline]
```

#### 10.296.4.8 GetAllFileNamesFromTagToValue()

```
Directory::FileNamesType gdcmm::StrictScanner::GetAllFileNamesFromTagToValue (
    Tag const & t,
    const char * valuref ) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valuref'

#### 10.296.4.9 GetFilenameFromTagToValue()

```
const char * gdcmm::StrictScanner::GetFilenameFromTagToValue (
    Tag const & t,
    const char * valuref ) const
```

Will loop over all files and return the first file where value match the reference value 'valuref'

#### 10.296.4.10 GetFileNames()

```
Directory::FileNamesType const & gdcmm::StrictScanner::GetFileNames ( ) const [inline]
```

#### 10.296.4.11 GetKeys()

```
Directory::FileNamesType gdcmm::StrictScanner::GetKeys ( ) const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed



#### 10.296.4.12 GetMapping()

```
TagToValue const & gdcm::StrictScanner::GetMapping (
    const char * filename ) const
```

Get the std::map mapping filenames to value for file 'filename'.

##### Examples

[SimpleScanner.cxx](#).

#### 10.296.4.13 GetMappingFromTagToValue()

```
TagToValue const & gdcm::StrictScanner::GetMappingFromTagToValue (
    Tag const & t,
    const char * value ) const
```

See [GetFilenameFromTagToValue\(\)](#). This is simply GetFilenameFromTagToValue followed.

#### 10.296.4.14 GetMappings()

```
MappingType const & gdcm::StrictScanner::GetMappings ( ) const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 10.296.4.15 GetOrderedValues()

```
Directory::FileNamesType gdcm::StrictScanner::GetOrderedValues (
    Tag const & t ) const
```

Get all the values found (in a vector) associated with [Tag](#) 't' This function is identical to GetValues, but is accessible from the wrapped layer (python, C#, java)

#### 10.296.4.16 GetValue()

```
const char * gdcm::StrictScanner::GetValue (
    const char * filename,
    Tag const & t ) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the GetMapping function, and then reuse the TagToValue hash table.

##### Warning

[Tag](#) 't' should have been added via [AddTag\(\)](#) prior to the [Scan\(\)](#) call !

**10.296.4.17 GetValues() [1/2]**

```
ValueType const & gdcm::StrictScanner::GetValues ( ) const [inline]
```

Get all the values found (in lexicographic order)

**10.296.4.18 GetValues() [2/2]**

```
ValueType gdcm::StrictScanner::GetValues (
    Tag const & t ) const
```

Get all the values found (in lexicographic order) associated with Tag 't'.

**10.296.4.19 IsKey()**

```
bool gdcm::StrictScanner::IsKey (
    const char * filename ) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

**Examples**

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

**10.296.4.20 New()**

```
static SmartPointer< StrictScanner > gdcm::StrictScanner::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

**Examples**

[ScanDirectory.cs](#).

#### 10.296.4.21 Print()

```
void gdcm::StrictScanner::Print (
    std::ostream & os ) const [override], [virtual]
```

Print result.

Reimplemented from [gdcm::Object](#).

#### 10.296.4.22 PrintTable()

```
void gdcm::StrictScanner::PrintTable (
    std::ostream & os ) const
```

#### 10.296.4.23 ProcessPublicTag()

```
void gdcm::StrictScanner::ProcessPublicTag (
    StringFilter & sf,
    const char * filename ) [protected]
```

#### 10.296.4.24 Scan()

```
bool gdcm::StrictScanner::Scan (
    Directory::FilenameType const & filenames )
```

Start the scan !

#### Examples

[ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

### 10.296.5 Friends And Related Function Documentation

### 10.296.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const StrictScanner & s ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmStrictScanner.h](#)

## 10.297 gdcm::StrictScanner2 Class Reference

[StrictScanner2.](#)

```
#include <gdcmStrictScanner2.h>
```

Inheritance diagram for gdcm::StrictScanner2:

Collaboration diagram for gdcm::StrictScanner2:

### Classes

- struct [Itstr](#)

### Public Types

- typedef PrivateMappingType::const\_iterator [PrivateConstIterator](#)
- typedef std::map< const char \*, [PrivateTagToValue](#), Itstr > [PrivateMappingType](#)
- typedef std::map< [PrivateTag](#), const char \* > [PrivateTagToValue](#)
- typedef PrivateTagToValue::value\_type [PrivateTagToValueValueType](#)
- typedef PublicMappingType::const\_iterator [PublicConstIterator](#)
- typedef std::map< const char \*, [PublicTagToValue](#), Itstr > [PublicMappingType](#)
- typedef std::map< [Tag](#), const char \* > [PublicTagToValue](#)
- typedef PublicTagToValue::value\_type [PublicTagToValueValueType](#)
- typedef std::set< std::string > [ValuesType](#)

## Public Member Functions

- [StrictScanner2](#) ()
- [~StrictScanner2](#) () override
- bool [AddPrivateTag](#) ([PrivateTag](#) const &pt)
- bool [AddPublicTag](#) ([Tag](#) const &t)
  - Add a tag that will need to be read. Those are root level tags.*
- bool [AddSkipTag](#) ([Tag](#) const &t)
  - Add a tag that will need to be skipped. Those are root level skip tags.*
- [PublicConstIterator](#) [Begin](#) () const
- void [ClearPrivateTags](#) ()
- void [ClearPublicTags](#) ()
- void [ClearSkipTags](#) ()
- [PublicConstIterator](#) [End](#) () const
- [Directory::FilenameType](#) [GetAllFilenamesFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- [Directory::FilenameType](#) [GetAllFilenamesFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- const char \* [GetFilenameFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*valueref) const
- const char \* [GetFilenameFromPublicTagToValue](#) ([Tag](#) const &t, const char \*valueref) const
- [Directory::FilenameType](#) const & [GetFilenames](#) () const
  - Return the list of filenames.*
- [Directory::FilenameType](#) [GetKeys](#) () const
- [PrivateTagToValue](#) const & [GetMappingFromPrivateTagToValue](#) ([PrivateTag](#) const &pt, const char \*value) const
- [PublicTagToValue](#) const & [GetMappingFromPublicTagToValue](#) ([Tag](#) const &t, const char \*value) const
- [PrivateTagToValue](#) const & [GetPrivateMapping](#) (const char \*filename) const
- [PrivateMappingType](#) const & [GetPrivateMappings](#) () const
- [Directory::FilenameType](#) [GetPrivateOrderedValues](#) ([PrivateTag](#) const &pt) const
- const char \* [GetPrivateValue](#) (const char \*filename, [PrivateTag](#) const &t) const
- [ValueType](#) [GetPrivateValues](#) ([PrivateTag](#) const &pt) const
- [PublicTagToValue](#) const & [GetPublicMapping](#) (const char \*filename) const
  - Get the std::map mapping filenames to value for file 'filename'.*
- [PublicMappingType](#) const & [GetPublicMappings](#) () const
- [Directory::FilenameType](#) [GetPublicOrderedValues](#) ([Tag](#) const &t) const
- const char \* [GetPublicValue](#) (const char \*filename, [Tag](#) const &t) const
- [ValueType](#) [GetPublicValues](#) ([Tag](#) const &t) const
  - Get all the values found (in lexicographic order) associated with Tag 't'.*
- [ValueType](#) const & [GetValues](#) () const
  - Get all the values found (in lexicographic order)*
- bool [IsKey](#) (const char \*filename) const
- void [Print](#) (std::ostream &os) const override
  - Print result.*
- void [PrintTable](#) (std::ostream &os, bool header=false) const
  - Print result as CSV table.*
- [PrivateConstIterator](#) [PrivateBegin](#) () const
- [PrivateConstIterator](#) [PrivateEnd](#) () const
- bool [Scan](#) ([Directory::FilenameType](#) const &filenames)
  - Start the scan !*

## Static Public Member Functions

- static [SmartPointer](#)< [StrictScanner2](#) > [New](#) ()  
*for wrapped language: instantiate a reference counted object*

## Protected Member Functions

- void [ProcessPrivateTag](#) ([StringFilter](#) &sf, const char \*filename)
- void [ProcessPublicTag](#) ([StringFilter](#) &sf, const char \*filename)

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [StrictScanner2](#) &s)

### 10.297.1 Detailed Description

#### [StrictScanner2](#).

This filter is meant for quickly browsing a [FileSet](#) (a set of files on disk). Special consideration are taken so as to read the minimum amount of information in each file in order to retrieve the user specified set of DICOM [Attribute](#).

This filter is dealing with both VRASCII and VRBINARY element, thanks to the help of [StringFilter](#)

#### Warning

IMPORTANT In case of file where tags are not ordered (illegal as per DICOM specification), the output will be missing information

#### Note

implementation details. All values are stored in a std::set of std::string. Then the address of the cstring underlying the std::string is used in the std::map.

This class implement the Subject/Observer pattern trigger the following events:

- [ProgressEvent](#)
- [StartEvent](#)
- [EndEvent](#)

### 10.297.2 Member Typedef Documentation

### 10.297.2.1 PrivateConstIterator

```
typedef PrivateMappingType::const_iterator gdcm::StrictScanner2::PrivateConstIterator
```

### 10.297.2.2 PrivateMappingType

```
typedef std::map<const char *, PrivateTagToValue, ltstr> gdcm::StrictScanner2::PrivateMappingType
```

### 10.297.2.3 PrivateTagToValue

```
typedef std::map<PrivateTag, const char *> gdcm::StrictScanner2::PrivateTagToValue
```

### 10.297.2.4 PrivateTagToValueValueType

```
typedef PrivateTagToValue::value_type gdcm::StrictScanner2::PrivateTagToValueValueType
```

### 10.297.2.5 PublicConstIterator

```
typedef PublicMappingType::const_iterator gdcm::StrictScanner2::PublicConstIterator
```

### 10.297.2.6 PublicMappingType

```
typedef std::map<const char *, PublicTagToValue, ltstr> gdcm::StrictScanner2::PublicMappingType
```

### 10.297.2.7 PublicTagToValue

```
typedef std::map<Tag, const char *> gdcm::StrictScanner2::PublicTagToValue
```

struct to map a filename to a value Implementation note: all std::map in this class will be using const char \* and not std::string since we are pointing to existing std::string (held in a std::vector) this avoid an extra copy of the byte array. [Tag](#) are used as [Tag](#) class since sizeof(tag) <= sizeof(pointer)

### 10.297.2.8 PublicTagToValueValueType

```
typedef PublicTagToValue::value_type gdc::StrictScanner2::PublicTagToValueValueType
```

### 10.297.2.9 ValuesType

```
typedef std::set<std::string> gdc::StrictScanner2::ValuesType
```

## 10.297.3 Constructor & Destructor Documentation

### 10.297.3.1 StrictScanner2()

```
gdc::StrictScanner2::StrictScanner2 ( ) [inline]
```

### 10.297.3.2 ~StrictScanner2()

```
gdc::StrictScanner2::~~StrictScanner2 ( ) [override]
```

## 10.297.4 Member Function Documentation

### 10.297.4.1 AddPrivateTag()

```
bool gdc::StrictScanner2::AddPrivateTag (
    PrivateTag const & pt )
```

### 10.297.4.2 AddPublicTag()

```
bool gdc::StrictScanner2::AddPublicTag (
    Tag const & t )
```

Add a tag that will need to be read. Those are root level tags.



### 10.297.4.3 AddSkipTag()

```
bool gdcm::StrictScanner2::AddSkipTag (
    Tag const & t )
```

Add a tag that will need to be skipped. Those are root level skip tags.

### 10.297.4.4 Begin()

```
PublicConstIterator gdcm::StrictScanner2::Begin ( ) const [inline]
```

### 10.297.4.5 ClearPrivateTags()

```
void gdcm::StrictScanner2::ClearPrivateTags ( )
```

### 10.297.4.6 ClearPublicTags()

```
void gdcm::StrictScanner2::ClearPublicTags ( )
```

### 10.297.4.7 ClearSkipTags()

```
void gdcm::StrictScanner2::ClearSkipTags ( )
```

### 10.297.4.8 End()

```
PublicConstIterator gdcm::StrictScanner2::End ( ) const [inline]
```

### 10.297.4.9 GetAllFilenamesFromPrivateTagToValue()

```
Directory::FilenamesType gdcm::StrictScanner2::GetAllFilenamesFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * valueresult ) const
```

#### 10.297.4.10 GetAllFileNamesFromPublicTagToValue()

```
Directory::FileNamesType gdcM::StrictScanner2::GetAllFileNamesFromPublicTagToValue (
    Tag const & t,
    const char * valuref ) const
```

Will loop over all files and return a vector of std::strings of filenames where value match the reference value 'valuref'

#### 10.297.4.11 GetFilenameFromPrivateTagToValue()

```
const char * gdcM::StrictScanner2::GetFilenameFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * valuref ) const
```

#### 10.297.4.12 GetFilenameFromPublicTagToValue()

```
const char * gdcM::StrictScanner2::GetFilenameFromPublicTagToValue (
    Tag const & t,
    const char * valuref ) const
```

Will loop over all files and return the first file where value match the reference value 'valuref'

#### 10.297.4.13 GetFileNames()

```
Directory::FileNamesType const & gdcM::StrictScanner2::GetFileNames ( ) const [inline]
```

Return the list of filenames.

#### 10.297.4.14 GetKeys()

```
Directory::FileNamesType gdcM::StrictScanner2::GetKeys ( ) const
```

Return the list of filename that are key in the internal map, which means those filename were properly parsed

#### 10.297.4.15 GetMappingFromPrivateTagToValue()

```
PrivateTagToValue const & gdcM::StrictScanner2::GetMappingFromPrivateTagToValue (
    PrivateTag const & pt,
    const char * value ) const
```

#### 10.297.4.16 GetMappingFromPublicTagToValue()

```
PublicTagToValue const & gdcm::StrictScanner2::GetMappingFromPublicTagToValue (
    Tag const & t,
    const char * value ) const
```

See GetFilenameFromTagToValue(). This is simply GetFilenameFromTagToValue followed

#### 10.297.4.17 GetPrivateMapping()

```
PrivateTagToValue const & gdcm::StrictScanner2::GetPrivateMapping (
    const char * filename ) const
```

#### 10.297.4.18 GetPrivateMappings()

```
PrivateMappingType const & gdcm::StrictScanner2::GetPrivateMappings ( ) const [inline]
```

#### 10.297.4.19 GetPrivateOrderedValues()

```
Directory::FileNamesType gdcm::StrictScanner2::GetPrivateOrderedValues (
    PrivateTag const & pt ) const
```

#### 10.297.4.20 GetPrivateValue()

```
const char * gdcm::StrictScanner2::GetPrivateValue (
    const char * filename,
    PrivateTag const & t ) const
```

#### 10.297.4.21 GetPrivateValues()

```
ValuesType gdcm::StrictScanner2::GetPrivateValues (
    PrivateTag const & pt ) const
```

Get all the values found (in lexicographic order) associated with [PrivateTag](#) 'pt'

#### 10.297.4.22 GetPublicMapping()

```
PublicTagToValue const & gdcM::StrictScanner2::GetPublicMapping (
    const char * filename ) const
```

Get the std::map mapping filenames to value for file 'filename'.

#### 10.297.4.23 GetPublicMappings()

```
PublicMappingType const & gdcM::StrictScanner2::GetPublicMappings ( ) const [inline]
```

Mappings are the mapping from a particular tag to the map, mapping filename to value:

#### 10.297.4.24 GetPublicOrderedValues()

```
Directory::FilenameType gdcM::StrictScanner2::GetPublicOrderedValues (
    Tag const & t ) const
```

Get all the values found (in a vector) associated with Tag 't' This function is identical to GetValues, but is accessible from the wrapped layer (python, C#, java)

#### 10.297.4.25 GetPublicValue()

```
const char * gdcM::StrictScanner2::GetPublicValue (
    const char * filename,
    Tag const & t ) const
```

Retrieve the value found for tag: t associated with file: filename This is meant for a single short call. If multiple calls (multiple tags) should be done, prefer the GetMapping function, and then reuse the TagToValue hash table.

#### Warning

Tag 't' should have been added via AddTag() prior to the Scan() call !

#### 10.297.4.26 GetPublicValues()

```
ValueType gdcM::StrictScanner2::GetPublicValues (
    Tag const & t ) const
```

Get all the values found (in lexicographic order) associated with Tag 't'.

#### 10.297.4.27 GetValues()

```
ValueType const & gdcm::StrictScanner2::GetValues ( ) const [inline]
```

Get all the values found (in lexicographic order)

#### 10.297.4.28 IsKey()

```
bool gdcm::StrictScanner2::IsKey (
    const char * filename ) const
```

Check if filename is a key in the Mapping table. returns true only if file can be found, which means the file was indeed a DICOM file that could be processed

#### 10.297.4.29 New()

```
static SmartPointer< StrictScanner2 > gdcm::StrictScanner2::New ( ) [inline], [static]
```

for wrapped language: instantiate a reference counted object

#### 10.297.4.30 Print()

```
void gdcm::StrictScanner2::Print (
    std::ostream & os ) const [override], [virtual]
```

Print result.

Reimplemented from [gdcm::Object](#).

#### 10.297.4.31 PrintTable()

```
void gdcm::StrictScanner2::PrintTable (
    std::ostream & os,
    bool header = false ) const
```

Print result as CSV table.

**10.297.4.32 PrivateBegin()**

```
PrivateConstIterator gdcm::StrictScanner2::PrivateBegin ( ) const [inline]
```

**10.297.4.33 PrivateEnd()**

```
PrivateConstIterator gdcm::StrictScanner2::PrivateEnd ( ) const [inline]
```

**10.297.4.34 ProcessPrivateTag()**

```
void gdcm::StrictScanner2::ProcessPrivateTag (
    StringFilter & sf,
    const char * filename ) [protected]
```

**10.297.4.35 ProcessPublicTag()**

```
void gdcm::StrictScanner2::ProcessPublicTag (
    StringFilter & sf,
    const char * filename ) [protected]
```

**10.297.4.36 Scan()**

```
bool gdcm::StrictScanner2::Scan (
    Directory::FileNamesType const & filenames )
```

Start the scan !

**10.297.5 Friends And Related Function Documentation**

## 10.297.5.1 operator&lt;&lt;

```
std::ostream & operator<< (
    std::ostream & _os,
    const StrictScanner2 & s ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmStrictScanner2.h](#)

## 10.298 gdcm::String< TDelimiter, TMaxLength, TPadChar > Class Template Reference

[String](#).

```
#include <gdcmString.h>
```

Inheritance diagram for gdcm::String< TDelimiter, TMaxLength, TPadChar >:

Collaboration diagram for gdcm::String< TDelimiter, TMaxLength, TPadChar >:

### Public Types

- typedef std::string::const\_iterator [const\\_iterator](#)
- typedef std::string::const\_reference [const\\_reference](#)
- typedef std::string::const\_reverse\_iterator [const\\_reverse\\_iterator](#)
- typedef std::string::difference\_type [difference\\_type](#)
- typedef std::string::iterator [iterator](#)
- typedef std::string::pointer [pointer](#)
- typedef std::string::reference [reference](#)
- typedef std::string::reverse\_iterator [reverse\\_iterator](#)
- typedef std::string::size\_type [size\\_type](#)
- typedef std::string::value\_type [value\\_type](#)

### Public Member Functions

- [String](#) ()  
*String constructors.*
- [String](#) (const std::string &s, [size\\_type](#) pos=0, [size\\_type](#) n=npos)
- [String](#) (const [value\\_type](#) \*s)
- [String](#) (const [value\\_type](#) \*s, [size\\_type](#) n)
- bool [IsValid](#) () const  
*return if string is valid*
- [operator const char \\*](#) () const  
*WARNING: Trailing \0 might be lost in this operation:*
- std::string [Trim](#) () const
- [gdcm::String](#)< TDelimiter, TMaxLength, TPadChar > [Truncate](#) () const

## Static Public Member Functions

- static std::string [Trim](#) (const char \*input)

### 10.298.1 Detailed Description

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
class gdcm::String< TDelimiter, TMaxLength, TPadChar >
```

[String](#).

#### Note

TDelimiter template parameter is used to separate multiple [String](#) (VM1 >) TMaxLength is only a hint. No one actually respect the max length TPadChar is the string padding (0 or space)

#### Examples

[TemplateEmptyImage.cxx](#).

### 10.298.2 Member Typedef Documentation

#### 10.298.2.1 const\_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::const_↵
iterator
```

#### 10.298.2.2 const\_reference

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_reference gdcm::String< TDelimiter, TMaxLength, TPadChar >::const_↵
reference
```

#### 10.298.2.3 const\_reverse\_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::const_reverse_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >↵
::const_reverse_iterator
```



#### 10.298.2.4 difference\_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::difference_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::difference←
_type
```

#### 10.298.2.5 iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::iterator
```

#### 10.298.2.6 pointer

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::pointer gdcm::String< TDelimiter, TMaxLength, TPadChar >::pointer
```

#### 10.298.2.7 reference

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::reference gdcm::String< TDelimiter, TMaxLength, TPadChar >::reference
```

#### 10.298.2.8 reverse\_iterator

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::reverse_iterator gdcm::String< TDelimiter, TMaxLength, TPadChar >::reverse←
_iterator
```

#### 10.298.2.9 size\_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::size_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::size_type
```

### 10.298.2.10 value\_type

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
typedef std::string::value_type gdcm::String< TDelimiter, TMaxLength, TPadChar >::value_type
```

## 10.298.3 Constructor & Destructor Documentation

### 10.298.3.1 String() [1/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String ( ) [inline]
```

[String](#) constructors.

### 10.298.3.2 String() [2/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
    const value\_type * s ) [inline]
```

### 10.298.3.3 String() [3/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
    const value\_type * s,
    size\_type n ) [inline]
```

### 10.298.3.4 String() [4/4]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar >::String (
    const std::string & s,
    size\_type pos = 0,
    size\_type n = npos ) [inline]
```

## 10.298.4 Member Function Documentation

### 10.298.4.1 IsValid()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
bool gdcmm::String< TDelimiter, TMaxLength, TPadChar >::IsValid ( ) const [inline]
```

return if string is valid

Referenced by [gdcmm::LO::IsValid\(\)](#), and [gdcmm::String< TDelimiter, TMaxLength, TPadChar >::Truncate\(\)](#).

### 10.298.4.2 operator const char \*()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcmm::String< TDelimiter, TMaxLength, TPadChar >::operator const char * ( ) const [inline]
```

WARNING: Trailing \0 might be lost in this operation:

### 10.298.4.3 Trim() [1/2]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
std::string gdcmm::String< TDelimiter, TMaxLength, TPadChar >::Trim ( ) const [inline]
```

Trim function is required to return a std::string object, otherwise we could not create a [gdcmm::String](#) object with an odd number of bytes...

#### Examples

[DumpExamCard.cxx](#).

### 10.298.4.4 Trim() [2/2]

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
static std::string gdcmm::String< TDelimiter, TMaxLength, TPadChar >::Trim (
    const char * input ) [inline], [static]
```

#### 10.298.4.5 Truncate()

```
template<char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
gdcm::String< TDelimiter, TMaxLength, TPadChar > gdcm::String< TDelimiter, TMaxLength, TPadChar
>::Truncate ( ) const [inline]
```

References [gdcm::String< TDelimiter, TMaxLength, TPadChar >::IsValid\(\)](#).

The documentation for this class was generated from the following file:

- [gdcmString.h](#)

### 10.299 gdcm::StringFilter Class Reference

[StringFilter](#).

```
#include <gdcmStringFilter.h>
```

#### Public Member Functions

- [StringFilter](#) ()
- [~StringFilter](#) ()
- bool [ExecuteQuery](#) (std::string const &query, std::string &value) const
- std::string [FromString](#) (const [Tag](#) &t, const char \*value, size\_t len)  
*Convert to string the char array defined by the pair (value,len)*
- [File](#) & [GetFile](#) ()
- const [File](#) & [GetFile](#) () const
- void [SetDicts](#) (const [Dicts](#) &dicts)  
*Allow user to pass in there own dicts.*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get File.*
- std::string [ToString](#) (const [DataElement](#) &de) const
- std::string [ToString](#) (const [PrivateTag](#) &t) const
- std::string [ToString](#) (const [Tag](#) &t) const  
*Directly from a Tag:*
- std::pair< std::string, std::string > [ToStringPair](#) (const [DataElement](#) &de) const
- std::pair< std::string, std::string > [ToStringPair](#) (const [Tag](#) &t) const  
*Directly from a Tag:*
- void [UseDictAlways](#) (bool)

#### Protected Member Functions

- bool [ExecuteQuery](#) (std::string const &query, [DataSet](#) const &ds, std::string &value) const
- std::pair< std::string, std::string > [ToStringPair](#) (const [Tag](#) &t, [DataSet](#) const &ds) const

## 10.299.1 Detailed Description

[StringFilter](#).

[StringFilter](#) is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language

### Examples

[DumpVisusChange.cxx](#), [ReadAndPrintAttributes.cxx](#), and [SimplePrintPatientName.cs](#).

## 10.299.2 Constructor & Destructor Documentation

### 10.299.2.1 StringFilter()

```
gdcm::StringFilter::StringFilter ( )
```

### 10.299.2.2 ~StringFilter()

```
gdcm::StringFilter::~~StringFilter ( )
```

## 10.299.3 Member Function Documentation

### 10.299.3.1 ExecuteQuery() [1/2]

```
bool gdcm::StringFilter::ExecuteQuery (
    std::string const & query,
    DataSet const & ds,
    std::string & value ) const [protected]
```

### 10.299.3.2 ExecuteQuery() [2/2]

```
bool gdcm::StringFilter::ExecuteQuery (
    std::string const & query,
    std::string & value ) const
```

Execute the XPATH query to find a value (as string) return false when attribute is not found (or an error in the XPATH query) You need to make sure that your XPATH query is syntactically correct

### 10.299.3.3 FromString()

```
std::string gdcM::StringFilter::FromString (
    const Tag & t,
    const char * value,
    size_t len )
```

Convert to string the char array defined by the pair (value,len)

### 10.299.3.4 GetFile() [1/2]

```
File & gdcM::StringFilter::GetFile ( ) [inline]
```

### 10.299.3.5 GetFile() [2/2]

```
const File & gdcM::StringFilter::GetFile ( ) const [inline]
```

### 10.299.3.6 SetDicts()

```
void gdcM::StringFilter::SetDicts (
    const Dicts & dicts )
```

Allow user to pass in there own dicts.

### 10.299.3.7 SetFile()

```
void gdcM::StringFilter::SetFile (
    const File & f ) [inline]
```

Set/Get [File](#).

### Examples

[DumpVisusChange.cxx](#), [ReadAndPrintAttributes.cxx](#), and [SimplePrintPatientName.cs](#).

### 10.299.3.8 ToString() [1/3]

```
std::string gdcm::StringFilter::ToString (
    const DataElement & de ) const
```

Convert to string the [ByteValue](#) contained in a [DataElement](#). The [DataElement](#) must be coming from the actual [DataSet](#) associated with [File](#) (see [SetFile](#)).

#### Examples

[DumpVisusChange.cxx](#), [ReadAndPrintAttributes.cxx](#), and [SimplePrintPatientName.cs](#).

### 10.299.3.9 ToString() [2/3]

```
std::string gdcm::StringFilter::ToString (
    const PrivateTag & t ) const
```

### 10.299.3.10 ToString() [3/3]

```
std::string gdcm::StringFilter::ToString (
    const Tag & t ) const
```

Directly from a [Tag](#):

### 10.299.3.11 ToStringPair() [1/3]

```
std::pair< std::string, std::string > gdcm::StringFilter::ToStringPair (
    const DataElement & de ) const
```

Convert to string the [ByteValue](#) contained in a [DataElement](#) the returned elements are: pair.first : the name as found in the dictionary of [DataElement](#) pari.second : the value encoded into a string (US,UL...) are properly converted

#### Examples

[ReadAndPrintAttributes.cxx](#).

### 10.299.3.12 ToStringPair() [2/3]

```
std::pair< std::string, std::string > gdcM::StringFilter::ToStringPair (
    const Tag & t ) const
```

Directly from a [Tag](#):

### 10.299.3.13 ToStringPair() [3/3]

```
std::pair< std::string, std::string > gdcM::StringFilter::ToStringPair (
    const Tag & t,
    DataSet const & ds ) const [protected]
```

### 10.299.3.14 UseDictAlways()

```
void gdcM::StringFilter::UseDictAlways (
    bool ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcMStringFilter.h](#)

## 10.300 gdcM::Study Class Reference

[Study](#).

```
#include <gdcMStudy.h>
```

### Public Member Functions

- [Study](#) ()=default

### 10.300.1 Detailed Description

[Study](#).

### 10.300.2 Constructor & Destructor Documentation



### 10.300.2.1 Study()

```
gdcm::Study::Study ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmStudy.h](#)

## 10.301 gdcm::Subject Class Reference

[Subject](#).

```
#include <gdcmSubject.h>
```

Inheritance diagram for gdcm::Subject:

Collaboration diagram for gdcm::Subject:

### Public Member Functions

- [Subject](#) ()
- [~Subject](#) () override
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*)
- unsigned long [AddObserver](#) (const [Event](#) &event, [Command](#) \*) const
- [Command](#) \* [GetCommand](#) (unsigned long tag)
- bool [HasObserver](#) (const [Event](#) &event) const
- void [InvokeEvent](#) (const [Event](#) &)
- void [InvokeEvent](#) (const [Event](#) &) const
- void [RemoveAllObservers](#) ()
- void [RemoveObserver](#) (unsigned long tag)

### Additional Inherited Members

### 10.301.1 Detailed Description

[Subject](#).

See also

[Command Event](#)

Examples

[BasicAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [ScanDirectory.cs](#), and [SimpleScanner.cxx](#).

## 10.301.2 Constructor & Destructor Documentation

### 10.301.2.1 Subject()

```
gdcM::Subject::Subject ( )
```

### 10.301.2.2 ~Subject()

```
gdcM::Subject::~~Subject ( ) [override]
```

## 10.301.3 Member Function Documentation

### 10.301.3.1 AddObserver() [1/2]

```
unsigned long gdcM::Subject::AddObserver (
    const Event & event,
    Command * )
```

Allow people to add/remove/invoke observers (callbacks) to any GDCM object. This is an implementation of the subject/observer design pattern. An observer is added by specifying an event to respond to and an [gdcM::Command](#) to execute. It returns an unsigned long tag which can be used later to remove the event or retrieve the command. The memory for the [Command](#) becomes the responsibility of this object, so don't pass the same instance of a command to two different objects

### 10.301.3.2 AddObserver() [2/2]

```
unsigned long gdcM::Subject::AddObserver (
    const Event & event,
    Command * ) const
```

### 10.301.3.3 GetCommand()

```
Command * gdcmm::Subject::GetCommand (
    unsigned long tag )
```

Get the command associated with the given tag. NOTE: This returns a pointer to a [Command](#), but it is safe to assign this to a `Command::Pointer`. Since [Command](#) inherits from `LightObject`, at this point in the code, only a pointer or a reference to the [Command](#) can be used.

### 10.301.3.4 HasObserver()

```
bool gdcmm::Subject::HasObserver (
    const Event & event ) const
```

Return true if an observer is registered for this event.

### 10.301.3.5 InvokeEvent() [1/2]

```
void gdcmm::Subject::InvokeEvent (
    const Event & )
```

Call Execute on all the Commands observing this event id.

### 10.301.3.6 InvokeEvent() [2/2]

```
void gdcmm::Subject::InvokeEvent (
    const Event & ) const
```

Call Execute on all the Commands observing this event id. The actions triggered by this call doesn't modify this object.

### 10.301.3.7 RemoveAllObservers()

```
void gdcmm::Subject::RemoveAllObservers ( )
```

Remove all observers .

### 10.301.3.8 RemoveObserver()

```
void gdcmm::Subject::RemoveObserver (
    unsigned long tag )
```

Remove the observer with this tag value.

The documentation for this class was generated from the following file:

- [gdcmmSubject.h](#)

## 10.302 gdcm::Surface Class Reference

This class defines a SURFACE IE.

```
#include <gdcmSurface.h>
```

Inheritance diagram for gdcm::Surface:

Collaboration diagram for gdcm::Surface:

### Public Types

- enum [STATES](#) {  
[NO](#) = 0 ,  
[YES](#) ,  
[UNKNOWN](#) ,  
[STATES\\_END](#) }
- enum [VIEWType](#) {  
[SURFACE](#) = 0 ,  
[WIREFRAME](#) ,  
[POINTS](#) ,  
[VIEWType\\_END](#) }

*Enumeration for Recommended Presentation [Type](#).*

### Public Member Functions

- [Surface](#) ()
- [~Surface](#) () override
- [SegmentHelper::BasicCodedEntry](#) & [GetAlgorithmFamily](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetAlgorithmFamily](#) () const
- const char \* [GetAlgorithmName](#) () const
- const char \* [GetAlgorithmVersion](#) () const
- const float \* [GetAxisOfRotation](#) () const
- const float \* [GetCenterOfRotation](#) () const
- [STATES](#) [GetFiniteVolume](#) () const
- [STATES](#) [GetManifold](#) () const
- float [GetMaximumPointDistance](#) () const
- float [GetMeanPointDistance](#) () const
- [MeshPrimitive](#) & [GetMeshPrimitive](#) ()
- [MeshPrimitive](#) const & [GetMeshPrimitive](#) () const
- unsigned long [GetNumberOfSurfacePoints](#) () const
- unsigned long [GetNumberOfVectors](#) () const
- [DataElement](#) & [GetPointCoordinatesData](#) ()
- const [DataElement](#) & [GetPointCoordinatesData](#) () const
- const float \* [GetPointPositionAccuracy](#) () const
- const float \* [GetPointsBoundingBoxCoordinates](#) () const
- [SegmentHelper::BasicCodedEntry](#) & [GetProcessingAlgorithm](#) ()
- [SegmentHelper::BasicCodedEntry](#) const & [GetProcessingAlgorithm](#) () const
- const unsigned short \* [GetRecommendedDisplayCIELabValue](#) () const

- unsigned short [GetRecommendedDisplayCIELabValue](#) (const unsigned int idx) const
- unsigned short [GetRecommendedDisplayGrayscaleValue](#) () const
- float [GetRecommendedPresentationOpacity](#) () const
- [VIEWType](#) [GetRecommendedPresentationType](#) () const
- const char \* [GetSurfaceComments](#) () const
- unsigned long [GetSurfaceNumber](#) () const
- bool [GetSurfaceProcessing](#) () const
- const char \* [GetSurfaceProcessingDescription](#) () const
- float [GetSurfaceProcessingRatio](#) () const
- const float \* [GetVectorAccuracy](#) () const
- [DataElement](#) & [GetVectorCoordinateData](#) ()
- const [DataElement](#) & [GetVectorCoordinateData](#) () const
- unsigned short [GetVectorDimensionality](#) () const
- void [SetAlgorithmFamily](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetAlgorithmName](#) (const char \*str)
- void [SetAlgorithmVersion](#) (const char \*str)
- void [SetAxisOfRotation](#) (const float \*axis)
- void [SetCenterOfRotation](#) (const float \*center)
- void [SetFiniteVolume](#) ([STATES](#) state)
- void [SetManifold](#) ([STATES](#) state)
- void [SetMaximumPointDistance](#) (float maximum)
- void [SetMeanPointDistance](#) (float average)
- void [SetMeshPrimitive](#) ([MeshPrimitive](#) &mp)
- void [SetNumberOfSurfacePoints](#) (const unsigned long nb)
- void [SetNumberOfVectors](#) (const unsigned long nb)
- void [SetPointCoordinatesData](#) ([DataElement](#) const &de)
- void [SetPointPositionAccuracy](#) (const float \*accuracies)
- void [SetPointsBoundingBoxCoordinates](#) (const float \*coordinates)
- void [SetProcessingAlgorithm](#) ([SegmentHelper::BasicCodedEntry](#) const &BSE)
- void [SetRecommendedDisplayCIELabValue](#) (const std::vector< unsigned short > &vl)
- void [SetRecommendedDisplayCIELabValue](#) (const unsigned short vl, const unsigned int idx=0)
- void [SetRecommendedDisplayCIELabValue](#) (const unsigned short vl[3])
- void [SetRecommendedDisplayGrayscaleValue](#) (const unsigned short vl)
- void [SetRecommendedPresentationOpacity](#) (const float opacity)
- void [SetRecommendedPresentationType](#) ([VIEWType](#) type)
- void [SetSurfaceComments](#) (const char \*comment)
- void [SetSurfaceNumber](#) (const unsigned long nb)
- void [SetSurfaceProcessing](#) (bool b)
- void [SetSurfaceProcessingDescription](#) (const char \*description)
- void [SetSurfaceProcessingRatio](#) (const float ratio)
- void [SetVectorAccuracy](#) (const float \*accuracy)
- void [SetVectorCoordinateData](#) ([DataElement](#) const &de)
- void [SetVectorDimensionality](#) (const unsigned short dim)

## Static Public Member Functions

- static [STATES](#) [GetSTATES](#) (const char \*state)
- static const char \* [GetSTATESString](#) ([STATES](#) state)
- static [VIEWType](#) [GetVIEWType](#) (const char \*type)
- static const char \* [GetVIEWTypeString](#) ([VIEWType](#) type)

## Additional Inherited Members

### 10.302.1 Detailed Description

This class defines a SURFACE IE.

This members are taken from required surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

### 10.302.2 Member Enumeration Documentation

#### 10.302.2.1 STATES

```
enum gdcm::Surface::STATES
```

Enumerator

NO	
YES	
UNKNOWN	
STATES_END	

#### 10.302.2.2 VIEWType

```
enum gdcm::Surface::VIEWType
```

Enumeration for Recommended Presentation [Type](#).

See also

Tag(0x0066, 0x000D) and PS 3.3 C.27.1.1.3

Enumerator

SURFACE	
WIREFRAME	
POINTS	
VIEWType_END	

### 10.302.3 Constructor & Destructor Documentation

#### 10.302.3.1 Surface()

```
gdcm::Surface::Surface ( )
```

#### 10.302.3.2 ~Surface()

```
gdcm::Surface::~~Surface ( ) [override]
```

### 10.302.4 Member Function Documentation

#### 10.302.4.1 GetAlgorithmFamily() [1/2]

```
SegmentHelper::BasicCodedEntry & gdcm::Surface::GetAlgorithmFamily ( )
```

#### 10.302.4.2 GetAlgorithmFamily() [2/2]

```
SegmentHelper::BasicCodedEntry const & gdcm::Surface::GetAlgorithmFamily ( ) const
```

#### 10.302.4.3 GetAlgorithmName()

```
const char * gdcm::Surface::GetAlgorithmName ( ) const
```

#### 10.302.4.4 GetAlgorithmVersion()

```
const char * gdcm::Surface::GetAlgorithmVersion ( ) const
```

#### 10.302.4.5 GetAxisOfRotation()

```
const float * gdcm::Surface::GetAxisOfRotation ( ) const
```

##### Note

Pointer is null if undefined

#### 10.302.4.6 GetCenterOfRotation()

```
const float * gdcm::Surface::GetCenterOfRotation ( ) const
```

##### Note

Pointer is null if undefined

#### 10.302.4.7 GetFiniteVolume()

```
STATES gdcm::Surface::GetFiniteVolume ( ) const
```

#### 10.302.4.8 GetManifold()

```
STATES gdcm::Surface::GetManifold ( ) const
```

#### 10.302.4.9 GetMaximumPointDistance()

```
float gdcm::Surface::GetMaximumPointDistance ( ) const
```

#### 10.302.4.10 GetMeanPointDistance()

```
float gdcm::Surface::GetMeanPointDistance ( ) const
```



**10.302.4.11 GetMeshPrimitive() [1/2]**

```
MeshPrimitive & gdcm::Surface::GetMeshPrimitive ( )
```

**10.302.4.12 GetMeshPrimitive() [2/2]**

```
MeshPrimitive const & gdcm::Surface::GetMeshPrimitive ( ) const
```

**10.302.4.13 GetNumberOfSurfacePoints()**

```
unsigned long gdcm::Surface::GetNumberOfSurfacePoints ( ) const
```

**10.302.4.14 GetNumberOfVectors()**

```
unsigned long gdcm::Surface::GetNumberOfVectors ( ) const
```

**10.302.4.15 GetPointCoordinatesData() [1/2]**

```
DataElement & gdcm::Surface::GetPointCoordinatesData ( )
```

**10.302.4.16 GetPointCoordinatesData() [2/2]**

```
const DataElement & gdcm::Surface::GetPointCoordinatesData ( ) const
```

**10.302.4.17 GetPointPositionAccuracy()**

```
const float * gdcm::Surface::GetPointPositionAccuracy ( ) const
```

**Note**

Pointer is null if undefined

**10.302.4.18 GetPointsBoundingBoxCoordinates()**

```
const float * gdcm::Surface::GetPointsBoundingBoxCoordinates ( ) const
```

**Note**

Pointer is null if undefined

**10.302.4.19 GetProcessingAlgorithm() [1/2]**

```
SegmentHelper::BasicCodedEntry & gdcm::Surface::GetProcessingAlgorithm ( )
```

**10.302.4.20 GetProcessingAlgorithm() [2/2]**

```
SegmentHelper::BasicCodedEntry const & gdcm::Surface::GetProcessingAlgorithm ( ) const
```

**10.302.4.21 GetRecommendedDisplayCIELabValue() [1/2]**

```
const unsigned short * gdcm::Surface::GetRecommendedDisplayCIELabValue ( ) const
```

**10.302.4.22 GetRecommendedDisplayCIELabValue() [2/2]**

```
unsigned short gdcm::Surface::GetRecommendedDisplayCIELabValue (
    const unsigned int idx ) const
```

**10.302.4.23 GetRecommendedDisplayGrayscaleValue()**

```
unsigned short gdcm::Surface::GetRecommendedDisplayGrayscaleValue ( ) const
```

#### 10.302.4.24 GetRecommendedPresentationOpacity()

```
float gdcm::Surface::GetRecommendedPresentationOpacity ( ) const
```

#### 10.302.4.25 GetRecommendedPresentationType()

```
VIEWType gdcm::Surface::GetRecommendedPresentationType ( ) const
```

#### 10.302.4.26 GetSTATES()

```
static STATES gdcm::Surface::GetSTATES (
    const char * state ) [static]
```

#### 10.302.4.27 GetSTATESString()

```
static const char * gdcm::Surface::GetSTATESString (
    STATES state ) [static]
```

#### 10.302.4.28 GetSurfaceComments()

```
const char * gdcm::Surface::GetSurfaceComments ( ) const
```

#### 10.302.4.29 GetSurfaceNumber()

```
unsigned long gdcm::Surface::GetSurfaceNumber ( ) const
```

#### 10.302.4.30 GetSurfaceProcessing()

```
bool gdcm::Surface::GetSurfaceProcessing ( ) const
```

**10.302.4.31 GetSurfaceProcessingDescription()**

```
const char * gdcm::Surface::GetSurfaceProcessingDescription ( ) const
```

**10.302.4.32 GetSurfaceProcessingRatio()**

```
float gdcm::Surface::GetSurfaceProcessingRatio ( ) const
```

**10.302.4.33 GetVectorAccuracy()**

```
const float * gdcm::Surface::GetVectorAccuracy ( ) const
```

**10.302.4.34 GetVectorCoordinateData() [1/2]**

```
DataElement & gdcm::Surface::GetVectorCoordinateData ( )
```

**10.302.4.35 GetVectorCoordinateData() [2/2]**

```
const DataElement & gdcm::Surface::GetVectorCoordinateData ( ) const
```

**10.302.4.36 GetVectorDimensionality()**

```
unsigned short gdcm::Surface::GetVectorDimensionality ( ) const
```

**10.302.4.37 GetVIEWType()**

```
static VIEWType gdcm::Surface::GetVIEWType (
    const char * type ) [static]
```

#### 10.302.4.38 GetVIEWTypeString()

```
static const char * gdcm::Surface::GetVIEWTypeString (
    VIEWType type ) [static]
```

#### 10.302.4.39 SetAlgorithmFamily()

```
void gdcm::Surface::SetAlgorithmFamily (
    SegmentHelper::BasicCodedEntry const & BSE )
```

#### 10.302.4.40 SetAlgorithmName()

```
void gdcm::Surface::SetAlgorithmName (
    const char * str )
```

#### 10.302.4.41 SetAlgorithmVersion()

```
void gdcm::Surface::SetAlgorithmVersion (
    const char * str )
```

#### 10.302.4.42 SetAxisOfRotation()

```
void gdcm::Surface::SetAxisOfRotation (
    const float * axis )
```

#### 10.302.4.43 SetCenterOfRotation()

```
void gdcm::Surface::SetCenterOfRotation (
    const float * center )
```

**10.302.4.44 SetFiniteVolume()**

```
void gdcM::Surface::SetFiniteVolume (
    STATES state )
```

**10.302.4.45 SetManifold()**

```
void gdcM::Surface::SetManifold (
    STATES state )
```

**10.302.4.46 SetMaximumPointDistance()**

```
void gdcM::Surface::SetMaximumPointDistance (
    float maximum )
```

**10.302.4.47 SetMeanPointDistance()**

```
void gdcM::Surface::SetMeanPointDistance (
    float average )
```

**10.302.4.48 SetMeshPrimitive()**

```
void gdcM::Surface::SetMeshPrimitive (
    MeshPrimitive & mp )
```

**10.302.4.49 SetNumberOfSurfacePoints()**

```
void gdcM::Surface::SetNumberOfSurfacePoints (
    const unsigned long nb )
```

**10.302.4.50 SetNumberOfVectors()**

```
void gdcm::Surface::SetNumberOfVectors (
    const unsigned long nb )
```

**10.302.4.51 SetPointCoordinatesData()**

```
void gdcm::Surface::SetPointCoordinatesData (
    DataElement const & de )
```

**10.302.4.52 SetPointPositionAccuracy()**

```
void gdcm::Surface::SetPointPositionAccuracy (
    const float * accuracies )
```

**10.302.4.53 SetPointsBoundingBoxCoordinates()**

```
void gdcm::Surface::SetPointsBoundingBoxCoordinates (
    const float * coordinates )
```

**10.302.4.54 SetProcessingAlgorithm()**

```
void gdcm::Surface::SetProcessingAlgorithm (
    SegmentHelper::BasicCodedEntry const & BSE )
```

**10.302.4.55 SetRecommendedDisplayCIELabValue()** [1/3]

```
void gdcm::Surface::SetRecommendedDisplayCIELabValue (
    const std::vector< unsigned short > & vl )
```

**10.302.4.56 SetRecommendedDisplayCIELabValue()** [2/3]

```
void gdcmm::Surface::SetRecommendedDisplayCIELabValue (
    const unsigned short vl,
    const unsigned int idx = 0 )
```

**10.302.4.57 SetRecommendedDisplayCIELabValue()** [3/3]

```
void gdcmm::Surface::SetRecommendedDisplayCIELabValue (
    const unsigned short vl[3] )
```

**10.302.4.58 SetRecommendedDisplayGrayscaleValue()**

```
void gdcmm::Surface::SetRecommendedDisplayGrayscaleValue (
    const unsigned short vl )
```

**10.302.4.59 SetRecommendedPresentationOpacity()**

```
void gdcmm::Surface::SetRecommendedPresentationOpacity (
    const float opacity )
```

**10.302.4.60 SetRecommendedPresentationType()**

```
void gdcmm::Surface::SetRecommendedPresentationType (
    VIEWType type )
```

**10.302.4.61 SetSurfaceComments()**

```
void gdcmm::Surface::SetSurfaceComments (
    const char * comment )
```



**10.302.4.62 SetSurfaceNumber()**

```
void gdcm::Surface::SetSurfaceNumber (
    const unsigned long nb )
```

**10.302.4.63 SetSurfaceProcessing()**

```
void gdcm::Surface::SetSurfaceProcessing (
    bool b )
```

**10.302.4.64 SetSurfaceProcessingDescription()**

```
void gdcm::Surface::SetSurfaceProcessingDescription (
    const char * description )
```

**10.302.4.65 SetSurfaceProcessingRatio()**

```
void gdcm::Surface::SetSurfaceProcessingRatio (
    const float ratio )
```

**10.302.4.66 SetVectorAccuracy()**

```
void gdcm::Surface::SetVectorAccuracy (
    const float * accuracy )
```

**10.302.4.67 SetVectorCoordinateData()**

```
void gdcm::Surface::SetVectorCoordinateData (
    DataElement const & de )
```

### 10.302.4.68 SetVectorDimensionality()

```
void gdcmm::Surface::SetVectorDimensionality (
    const unsigned short dim )
```

The documentation for this class was generated from the following file:

- [gdcmmSurface.h](#)

## 10.303 gdcmm::SurfaceHelper Class Reference

[SurfaceHelper](#).

```
#include <gdcmmSurfaceHelper.h>
```

### Public Types

- typedef std::vector< unsigned short > [ColorArray](#)

### Static Public Member Functions

- template<typename T , typename U >  
static std::vector< T > [RecommendedDisplayCIELabToRGB](#) (const [ColorArray](#) &CIELab, const U range↔Max=255)  
*Convert a DICOM CIE-Lab (after reading) color into RGB.*
- template<typename U >  
static std::vector< float > [RecommendedDisplayCIELabToRGB](#) (const [ColorArray](#) &CIELab, const U range↔Max=255)  
*Convert a DICOM CIE-Lab (after reading) color into RGB.*
- template<typename T , typename U >  
static [ColorArray](#) [RGBToRecommendedDisplayCIELab](#) (const std::vector< T > &RGB, const U rangeMax=255)  
*Convert a RGB color into DICOM CIE-Lab (ready to write).*
- template<typename T , typename U >  
static unsigned short [RGBToRecommendedDisplayGrayscale](#) (const std::vector< T > &RGB, const U range↔Max=255)  
*Convert a RGB color into DICOM grayscale (ready to write).*

### 10.303.1 Detailed Description

[SurfaceHelper](#).

Helper class for [Surface](#) object

## 10.303.2 Member Typedef Documentation

### 10.303.2.1 ColorArray

```
typedef std::vector< unsigned short > gdcm::SurfaceHelper::ColorArray
```

## 10.303.3 Member Function Documentation

### 10.303.3.1 RecommendedDisplayCIELabToRGB() [1/2]

```
template<typename T , typename U >
std::vector< T > gdcm::SurfaceHelper::RecommendedDisplayCIELabToRGB (
    const ColorArray & CIELab,
    const U rangeMax = 255 ) [static]
```

Convert a DICOM CIE-Lab (after reading) color into RGB.

See also

PS 3.3 C.10.7.1.1

#### Parameters

<i>CIELab</i>	DICOM CIE-Lab array.
<i>rangeMax</i>	Max value of the RGB range.

#### Template Parameters

<i>T</i>	Type of CIELab components.
<i>U</i>	Type of rangeMax value.

### 10.303.3.2 RecommendedDisplayCIELabToRGB() [2/2]

```
template<typename U >
std::vector< float > gdcm::SurfaceHelper::RecommendedDisplayCIELabToRGB (
```

```
const ColorArray & CIELab,
const U rangeMax = 255 ) [static]
```

Convert a DICOM CIE-Lab (after reading) color into RGB.

See also

PS 3.3 C.10.7.1.1

Parameters

<i>CIELab</i>	DICOM CIE-Lab array.
<i>rangeMax</i>	Max value of the RGB range.

Template Parameters

<i>U</i>	Type of rangeMax value.
----------	-------------------------

### 10.303.3.3 RGBToRecommendedDisplayCIELab()

```
template<typename T , typename U >
SurfaceHelper::ColorArray gdc::SurfaceHelper::RGBToRecommendedDisplayCIELab (
    const std::vector< T > & RGB,
    const U rangeMax = 255 ) [static]
```

Convert a RGB color into DICOM CIE-Lab (ready to write).

See also

PS 3.3 C.10.7.1.1

Parameters

<i>RGB</i>	RGB array.
<i>rangeMax</i>	Max value of the RGB range.

Template Parameters

<i>T</i>	Type of RGB components.
<i>U</i>	Type of rangeMax value.

### 10.303.3.4 RGBToRecommendedDisplayGrayscale()

```
template<typename T , typename U >
unsigned short gdcm::SurfaceHelper::RGBToRecommendedDisplayGrayscale (
    const std::vector< T > & RGB,
    const U rangeMax = 255 ) [static]
```

Convert a RGB color into DICOM grayscale (ready to write).

See also

PS 3.3 C.27.1 tag(0062,000C)

Parameters

<i>RGB</i>	RGB array.
<i>rangeMax</i>	Max value of the RGB range.

Template Parameters

<i>T</i>	Type of RGB components.
<i>U</i>	Type of rangeMax value.

The documentation for this class was generated from the following file:

- [gdcmSurfaceHelper.h](#)

## 10.304 gdcm::SurfaceReader Class Reference

This class defines a SURFACE IE reader.

```
#include <gdcmSurfaceReader.h>
```

Inheritance diagram for gdcm::SurfaceReader:

Collaboration diagram for gdcm::SurfaceReader:

### Public Member Functions

- [SurfaceReader](#) ()
- [~SurfaceReader](#) () override
- unsigned long [GetNumberOfSurfaces](#) () const
- bool [Read](#) () override

*Read.*

## Protected Member Functions

- bool [ReadPointMacro](#) ([SmartPointer](#)< [Surface](#) > surface, const [DataSet](#) &surfaceDS)
- bool [ReadSurface](#) (const [Item](#) &surfaceItem, const unsigned long idx)
- bool [ReadSurfaces](#) ()

## Additional Inherited Members

### 10.304.1 Detailed Description

This class defines a SURFACE IE reader.

It reads surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

### 10.304.2 Constructor & Destructor Documentation

#### 10.304.2.1 [SurfaceReader\(\)](#)

```
gdcm::SurfaceReader::SurfaceReader ( )
```

#### 10.304.2.2 [~SurfaceReader\(\)](#)

```
gdcm::SurfaceReader::~~SurfaceReader ( ) [override]
```

### 10.304.3 Member Function Documentation

#### 10.304.3.1 [GetNumberOfSurfaces\(\)](#)

```
unsigned long gdcm::SurfaceReader::GetNumberOfSurfaces ( ) const
```

### 10.304.3.2 Read()

```
bool gdcm::SurfaceReader::Read ( ) [override], [virtual]
```

Read.

Reimplemented from [gdcm::SegmentReader](#).

### 10.304.3.3 ReadPointMacro()

```
bool gdcm::SurfaceReader::ReadPointMacro (
    SmartPointer< Surface > surface,
    const DataSet & surfaceDS ) [protected]
```

### 10.304.3.4 ReadSurface()

```
bool gdcm::SurfaceReader::ReadSurface (
    const Item & surfaceItem,
    const unsigned long idx ) [protected]
```

### 10.304.3.5 ReadSurfaces()

```
bool gdcm::SurfaceReader::ReadSurfaces ( ) [protected]
```

The documentation for this class was generated from the following file:

- [gdcmSurfaceReader.h](#)

## 10.305 gdcm::SurfaceWriter Class Reference

This class defines a SURFACE IE writer.

```
#include <gdcmSurfaceWriter.h>
```

Inheritance diagram for `gdcm::SurfaceWriter`:

Collaboration diagram for `gdcm::SurfaceWriter`:

## Public Member Functions

- [SurfaceWriter](#) ()
- [~SurfaceWriter](#) () override
- unsigned long [GetNumberOfSurfaces](#) ()
- void [SetNumberOfSurfaces](#) (const unsigned long nb)
- bool [Write](#) () override

*Write.*

## Protected Member Functions

- void [ComputeNumberOfSurfaces](#) ()
- bool [PrepareWrite](#) ()
- bool [PrepareWritePointMacro](#) ([SmartPointer](#)< [Surface](#) > surface, [DataSet](#) &surfaceDS, const [TransferSyntax](#) &ts)

## Protected Attributes

- unsigned long [NumberOfSurfaces](#)

## Additional Inherited Members

### 10.305.1 Detailed Description

This class defines a SURFACE IE writer.

It writes surface mesh module attributes.

See also

PS 3.3 A.1.2.18 , A.57 and C.27

### 10.305.2 Constructor & Destructor Documentation

#### 10.305.2.1 SurfaceWriter()

```
gdcm::SurfaceWriter::SurfaceWriter ( )
```



### 10.305.2.2 ~SurfaceWriter()

```
gdcm::SurfaceWriter::~~SurfaceWriter ( ) [override]
```

## 10.305.3 Member Function Documentation

### 10.305.3.1 ComputeNumberOfSurfaces()

```
void gdcm::SurfaceWriter::ComputeNumberOfSurfaces ( ) [protected]
```

### 10.305.3.2 GetNumberOfSurfaces()

```
unsigned long gdcm::SurfaceWriter::GetNumberOfSurfaces ( )
```

### 10.305.3.3 PrepareWrite()

```
bool gdcm::SurfaceWriter::PrepareWrite ( ) [protected]
```

### 10.305.3.4 PrepareWritePointMacro()

```
bool gdcm::SurfaceWriter::PrepareWritePointMacro (
    SmartPointer< Surface > surface,
    DataSet & surfaceDS,
    const TransferSyntax & ts ) [protected]
```

### 10.305.3.5 SetNumberOfSurfaces()

```
void gdcm::SurfaceWriter::SetNumberOfSurfaces (
    const unsigned long nb )
```

### 10.305.3.6 Write()

```
bool gdcM::SurfaceWriter::Write ( ) [override], [virtual]
```

Write.

Reimplemented from [gdcM::SegmentWriter](#).

## 10.305.4 Member Data Documentation

### 10.305.4.1 NumberOfSurfaces

```
unsigned long gdcM::SurfaceWriter::NumberOfSurfaces [protected]
```

The documentation for this class was generated from the following file:

- [gdcMSurfaceWriter.h](#)

## 10.306 gdcM::SwapCode Class Reference

[SwapCode](#) representation.

```
#include <gdcMSwapCode.h>
```

### Public Types

- enum [SwapCodeType](#) {  
    [Unknown](#) = 0 ,  
    [LittleEndian](#) = 1234 ,  
    [BigEndian](#) = 4321 ,  
    [BadLittleEndian](#) = 3412 ,  
    [BadBigEndian](#) = 2143 }

### Public Member Functions

- [SwapCode](#) ([SwapCodeType](#) sc=[Unknown](#))
- [operator SwapCode::SwapCodeType](#) () const

### Static Public Member Functions

- static const char \* [GetSwapCodeString](#) ([SwapCode](#) const &sc)

## Static Protected Member Functions

- static int [GetIndex](#) ([SwapCode](#) const &sc)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [SwapCode](#) &sc)

### 10.306.1 Detailed Description

[SwapCode](#) representation.

Examples

[TestByteSwap.cxx](#).

### 10.306.2 Member Enumeration Documentation

#### 10.306.2.1 SwapCodeType

enum [gdcm::SwapCode::SwapCodeType](#)

Enumerator

Unknown	
LittleEndian	
BigEndian	
BadLittleEndian	
BadBigEndian	

### 10.306.3 Constructor & Destructor Documentation

#### 10.306.3.1 SwapCode()

```
gdcm::SwapCode::SwapCode (
    SwapCodeType sc = Unknown ) [inline]
```

## 10.306.4 Member Function Documentation

### 10.306.4.1 GetIndex()

```
static int gdcM::SwapCode::GetIndex (
    SwapCode const & sc ) [static], [protected]
```

### 10.306.4.2 GetSwapCodeString()

```
static const char * gdcM::SwapCode::GetSwapCodeString (
    SwapCode const & sc ) [static]
```

### 10.306.4.3 operator SwapCode::SwapCodeType()

```
gdcM::SwapCode::operator SwapCode::SwapCodeType ( ) const [inline]
```

## 10.306.5 Friends And Related Function Documentation

### 10.306.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const SwapCode & sc ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMSwapCode.h](#)

## 10.307 gdcM::SwapperDoOp Class Reference

```
#include <gdcMSwapper.h>
```

## Static Public Member Functions

- `template<typename T >`  
`static T Swap (T val)`
- `template<typename T >`  
`static void SwapArray (T *array, size_t n)`

### 10.307.1 Member Function Documentation

#### 10.307.1.1 [Swap\(\)](#)

```
template<typename T >
static T gdcm::SwapperDoOp::Swap (
    T val ) [static]
```

#### 10.307.1.2 [SwapArray\(\)](#)

```
template<typename T >
static void gdcm::SwapperDoOp::SwapArray (
    T * array,
    size_t n ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmSwapper.h](#)

## 10.308 gdcm::SwapperNoOp Class Reference

```
#include <gdcmSwapper.h>
```

## Static Public Member Functions

- `template<typename T >`  
`static T Swap (T val)`
- `template<typename T >`  
`static void SwapArray (T *, size_t)`

### 10.308.1 Detailed Description

#### Examples

[DumpSiemensBase64.cxx](#), [DumpToshibaDTI.cxx](#), [DumpToshibaDTI2.cxx](#), and [ReadExplicitLengthSQIVR.cxx](#).

### 10.308.2 Member Function Documentation

#### 10.308.2.1 Swap()

```
template<typename T >
static T gdcM::SwapperNoOp::Swap (
    T val ) [inline], [static]
```

#### 10.308.2.2 SwapArray()

```
template<typename T >
static void gdcM::SwapperNoOp::SwapArray (
    T * ,
    size_t ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcMSwapper.h](#)

## 10.309 gdcM::System Class Reference

Class to do system operation.

```
#include <gdcMSystem.h>
```

## Static Public Member Functions

- static std::wstring [ConvertToUNC](#) (const char \*utf8path)
- static bool [DeleteDirectory](#) (const char \*source)  
*remove a directory named source*
- static size\_t [EncodeBytes](#) (char \*out, const unsigned char \*data, int size)
- static bool [FileExists](#) (const char \*filename)  
*Check whether the specified file exist on the system.*
- static bool [FileIsDirectory](#) (const char \*name)  
*Check whether the file specified is a directory:*
- static bool [FileIsSymlink](#) (const char \*name)  
*Check whether name is a symlink.*
- static size\_t [FileSize](#) (const char \*filename)
- static time\_t [FileTime](#) (const char \*filename)
- static bool [FormatDateTime](#) (char date[22], time\_t t, long milliseconds=0)
- static bool [GetCurrentDateTime](#) (char date[22])
- static const char \* [GetCurrentModuleFileName](#) ()
- static const char \* [GetCurrentProcessFileName](#) ()
- static const char \* [GetCurrentResourcesDirectory](#) ()
- static const char \* [GetCWD](#) ()
- static bool [GetHostName](#) (char hostname[255])
- static const char \* [GetLastError](#) ()  
*Return the last error.*
- static const char \* [GetLocaleCharset](#) ()  
*return locale charmap*
- static const char \* [GetTimezoneOffsetFromUTC](#) ()
- static bool [MakeDirectory](#) (const char \*path)  
*Create a directory name path.*
- static bool [ParseDateTime](#) (time\_t &timep, const char date[22])  
*Parse a date stored as ASCII text into a time\_t structured (discard millisecond if any)*
- static bool [ParseDateTime](#) (time\_t &timep, long &milliseconds, const char date[22])
- static bool [RemoveFile](#) (const char \*source)  
*remove a file named source*
- static int [StrCaseCmp](#) (const char \*s1, const char \*s2)  
*consistent func for C99 spec of strcasecmp/strncasecmp*
- static int [StrNCaseCmp](#) (const char \*s1, const char \*s2, size\_t n)
- static char \* [StrSep](#) (char \*\*stringp, const char \*delim)
- static char \* [StrTokR](#) (char \*ptr, const char \*sep, char \*\*end)  
*strtok\_r*

## Static Protected Member Functions

- static bool [GetPermissions](#) (const char \*file, unsigned short &mode)  
*NOT THREAD SAFE.*
- static bool [SetPermissions](#) (const char \*file, unsigned short mode)

### 10.309.1 Detailed Description

Class to do system operation.

OS independent functionalities

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [Cleaner.cs](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressLossyJPEG.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [DumpCSA.cs](#), [ExtractEncapsulatedFile.cs](#), [ExtractImageRegion.cs](#), [ExtractImageRegionWithLUT.cs](#), [ExtractOneFrame.cs](#), [FileAnonymize.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FileStreaming.cs](#), [GetArray.cs](#), [MetaImageMD5Activiz.cs](#), [MpegVideoInfo.cs](#), [ReformatFile.cs](#), [RescaleImage.cs](#), [ScanDirectory.cs](#), [SimplePrint.cs](#), and [StandardizeFiles.cs](#).

### 10.309.2 Member Function Documentation

#### 10.309.2.1 ConvertToUNC()

```
static std::wstring gdcm::System::ConvertToUNC (
    const char * utf8path ) [static]
```

When needed convert a PATH into a UNC equivalent. This allow transparent support for path longer than MAX\_PATH. Only on \_MSC\_VER compiler, return empty string otherwise.

#### 10.309.2.2 DeleteDirectory()

```
static bool gdcm::System::DeleteDirectory (
    const char * source ) [static]
```

remove a directory named source

#### 10.309.2.3 EncodeBytes()

```
static size_t gdcm::System::EncodeBytes (
    char * out,
    const unsigned char * data,
    int size ) [static]
```

Used internally by the [UIDGenerator](#) class to convert a uuid tape to a DICOM [VR:UI](#) type



#### 10.309.2.4 FileExists()

```
static bool gdcm::System::FileExists (
    const char * filename ) [static]
```

Check whether the specified file exist on the system.

##### Examples

[DumpVisusChange.cxx](#), [EncapsulateFileInRawData.cxx](#), [MagnifyFile.cxx](#), and [gdcmorthoplanes.cxx](#).

#### 10.309.2.5 FileIsDirectory()

```
static bool gdcm::System::FileIsDirectory (
    const char * name ) [static]
```

Check whether the file specified is a directory:

##### Examples

[DumpVisusChange.cxx](#), [gdcmorthoplanes.cxx](#), and [threadgdcm.cxx](#).

#### 10.309.2.6 FileIsSymlink()

```
static bool gdcm::System::FileIsSymlink (
    const char * name ) [static]
```

Check whether name is a symlink.

#### 10.309.2.7 FileSize()

```
static size_t gdcm::System::FileSize (
    const char * filename ) [static]
```

Return the filesize. 0 if file does not exist.

##### Warning

you need to use FileExists to differentiate between empty file and missing file.

for very large size file and on system where size\_t is not appropriate to store off\_t value the function will return 0.

##### Examples

[CheckBigEndianBug.cxx](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [EncapsulateFileInRawData.cxx](#), and [SimpleScanner.cxx](#).

### 10.309.2.8 FileTime()

```
static time_t gdcm::System::FileTime (
    const char * filename ) [static]
```

Return the time of last modification of file 0 if the file does not exist

### 10.309.2.9 FormatDateTime()

```
static bool gdcm::System::FormatDateTime (
    char date[22],
    time_t t,
    long milliseconds = 0 ) [static]
```

format as ASCII text a time\_t with milliseconds See [VR::DT](#) from DICOM PS 3.5 milliseconds is in the range [0, 999999]

### 10.309.2.10 GetCurrentDateTime()

```
static bool gdcm::System::GetCurrentDateTime (
    char date[22] ) [static]
```

Return the current data time, and format it as ASCII text. This is simply a call to `gettimeofday` + `FormatDateTime`, since WIN32 do not have an implementation for `gettimeofday`, this is more portable. The call `time(0)` is not precise for our resolution

#### Examples

[TemplateEmptyImage.cxx](#).

### 10.309.2.11 GetCurrentModuleFileName()

```
static const char * gdcm::System::GetCurrentModuleFileName ( ) [static]
```

Return the directory the current module is located: NOT THREAD SAFE

### 10.309.2.12 GetCurrentProcessFileName()

```
static const char * gdcm::System::GetCurrentProcessFileName ( ) [static]
```

Return the directory the current process (executable) is located: NOT THREAD SAFE

### 10.309.2.13 GetCurrentResourcesDirectory()

```
static const char * gdcmm::System::GetCurrentResourcesDirectory ( ) [static]
```

On some system (Apple) return the path to the current bundled 'Resources' directory NOT THREAD SAFE

### 10.309.2.14 GetCWD()

```
static const char * gdcmm::System::GetCWD ( ) [static]
```

Return current working directory Warning: if current working path is too long (>2048 bytes) the call will fail and call will return NULL NOT THREAD SAFE

### 10.309.2.15 GetHostName()

```
static bool gdcmm::System::GetHostName (
    char hostname[255] ) [static]
```

Retrieve the hostname, only the first 255 byte are copied. This may come handy to specify the Station Name

### 10.309.2.16 GetLastSystemError()

```
static const char * gdcmm::System::GetLastSystemError ( ) [static]
```

Return the last error.

### 10.309.2.17 GetLocaleCharset()

```
static const char * gdcmm::System::GetLocaleCharset ( ) [static]
```

return locale charmap

### 10.309.2.18 GetPermissions()

```
static bool gdcmm::System::GetPermissions (
    const char * file,
    unsigned short & mode ) [static], [protected]
```

NOT THREAD SAFE.

### 10.309.2.19 GetTimezoneOffsetFromUTC()

```
static const char * gdcM::System::GetTimezoneOffsetFromUTC ( ) [static]
```

Return the value for Timezone Offset From UTC as string.

#### Warning

not thread safe

### 10.309.2.20 MakeDirectory()

```
static bool gdcM::System::MakeDirectory (
    const char * path ) [static]
```

Create a directory name path.

### 10.309.2.21 ParseDateTime() [1/2]

```
static bool gdcM::System::ParseDateTime (
    time_t & timep,
    const char date[22] ) [static]
```

Parse a date stored as ASCII text into a time\_t structured (discard millisecond if any)

### 10.309.2.22 ParseDateTime() [2/2]

```
static bool gdcM::System::ParseDateTime (
    time_t & timep,
    long & milliseconds,
    const char date[22] ) [static]
```

Parse a date stored as ASCII text into a time\_t structured and millisecond

#### See also

[FormatDateTime](#)

### 10.309.2.23 RemoveFile()

```
static bool gdcm::System::RemoveFile (
    const char * source ) [static]
```

remove a file named source

### 10.309.2.24 SetPermissions()

```
static bool gdcm::System::SetPermissions (
    const char * file,
    unsigned short mode ) [static], [protected]
```

### 10.309.2.25 StrCaseCmp()

```
static int gdcm::System::StrCaseCmp (
    const char * s1,
    const char * s2 ) [static]
```

consistent func for C99 spec of strcasecmp/strncasecmp

### 10.309.2.26 StrNCaseCmp()

```
static int gdcm::System::StrNCaseCmp (
    const char * s1,
    const char * s2,
    size_t n ) [static]
```

#### Precondition

n != 0

### 10.309.2.27 StrSep()

```
static char * gdcm::System::StrSep (
    char ** stringp,
    const char * delim ) [static]
```

strsep param stringp is passed by pointer, it may be modified, you'll need to make a copy, in case you want to free the memory pointed at

### 10.309.2.28 StrTokR()

```
static char * gdcM::System::StrTokR (  
    char * ptr,  
    const char * sep,  
    char ** end ) [static]
```

strtok\_r

The documentation for this class was generated from the following file:

- [gdcMSystem.h](#)

## 10.310 gdcM::Table Class Reference

[Table](#).

```
#include <gdcMTable.h>
```

Collaboration diagram for gdcM::Table:

### Public Types

- typedef std::map< [Tag](#), [TableEntry](#) > [MapTableEntry](#)

### Public Member Functions

- [Table](#) ()=default
- [Table](#) (const [Table](#) &\_val)=delete
- [~Table](#) ()=default
- const [TableEntry](#) & [GetTableEntry](#) (const [Tag](#) &tag) const
- void [InsertEntry](#) ([Tag](#) const &tag, [TableEntry](#) const &te)
- [Table](#) & [operator=](#) (const [Table](#) &\_val)=delete

### Public Attributes

- [MapTableEntry](#) [TableInternal](#)

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Table](#) &\_val)

## 10.310.1 Detailed Description

[Table](#).

## 10.310.2 Member Typedef Documentation

### 10.310.2.1 MapTableEntry

```
typedef std::map<Tag, TableEntry> gdcm::Table::MapTableEntry
```

## 10.310.3 Constructor & Destructor Documentation

### 10.310.3.1 Table() [1/2]

```
gdcm::Table::Table ( ) [default]
```

### 10.310.3.2 ~Table()

```
gdcm::Table::~~Table ( ) [default]
```

### 10.310.3.3 Table() [2/2]

```
gdcm::Table::Table (
    const Table & _val ) [delete]
```

## 10.310.4 Member Function Documentation

#### 10.310.4.1 `GetTableEntry()`

```
const TableEntry & gdcM::Table::GetTableEntry (
    const Tag & tag ) const [inline]
```

References [GetTableEntry\(\)](#), and [TableInternal](#).

Referenced by [GetTableEntry\(\)](#).

#### 10.310.4.2 `InsertEntry()`

```
void gdcM::Table::InsertEntry (
    Tag const & tag,
    TableEntry const & te ) [inline]
```

References [TableInternal](#).

#### 10.310.4.3 `operator=()`

```
Table & gdcM::Table::operator= (
    const Table & _val ) [delete]
```

### 10.310.5 Friends And Related Function Documentation

#### 10.310.5.1 `operator<<`

```
std::ostream & operator<< (
    std::ostream & _os,
    const Table & _val ) [friend]
```

### 10.310.6 Member Data Documentation



### 10.310.6.1 TableInternal

`MapTableEntry` `gdcm::Table::TableInternal`

Referenced by `GetTableEntry()`, and `InsertEntry()`.

The documentation for this class was generated from the following file:

- `gdcmTable.h`

## 10.311 gdcm::TableEntry Class Reference

`TableEntry`.

```
#include <gdcmTableEntry.h>
```

### Public Member Functions

- `TableEntry` (`const char *attribute=nullptr`, `Type` `const &type=Type()`, `const char *des=nullptr`)
- `~TableEntry` ()=default

### 10.311.1 Detailed Description

`TableEntry`.

### 10.311.2 Constructor & Destructor Documentation

#### 10.311.2.1 TableEntry()

```
gdcm::TableEntry::TableEntry (  
    const char * attribute = nullptr,  
    Type const & type = Type(),  
    const char * des = nullptr ) [inline]
```

### 10.311.2.2 ~TableEntry()

```
gdcm::TableEntry::~TableEntry ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmTableEntry.h](#)

## 10.312 gdcm::TableReader Class Reference

Class for representing a [TableReader](#).

```
#include <gdcmTableReader.h>
```

Inheritance diagram for gdcm::TableReader:

### Public Member Functions

- [TableReader](#) (Defs &defs)
- virtual [~TableReader](#) ()=default
- virtual void [CharacterDataHandler](#) (const char \*data, int length)
- virtual void [EndElement](#) (const char \*name)
- const Defs & [GetDefs](#) () const
- const char \* [GetFilename](#) ()
- void [HandleIOD](#) (const char \*\*atts)
- void [HandleIODEntry](#) (const char \*\*atts)
- void [HandleMacro](#) (const char \*\*atts)
- void [HandleMacroEntry](#) (const char \*\*atts)
- void [HandleMacroEntryDescription](#) (const char \*\*atts)
- void [HandleModule](#) (const char \*\*atts)
- void [HandleModuleEntry](#) (const char \*\*atts)
- void [HandleModuleEntryDescription](#) (const char \*\*atts)
- void [HandleModuleInclude](#) (const char \*\*atts)
- int [Read](#) ()
- void [SetFilename](#) (const char \*filename)
- virtual void [StartElement](#) (const char \*name, const char \*\*atts)

### 10.312.1 Detailed Description

Class for representing a [TableReader](#).

#### Note

This class is an empty shell meant to be derived

## 10.312.2 Constructor & Destructor Documentation

### 10.312.2.1 TableReader()

```
gdcm::TableReader::TableReader (
    Defs & defs ) [inline]
```

### 10.312.2.2 ~TableReader()

```
virtual gdcm::TableReader::~~TableReader ( ) [virtual], [default]
```

## 10.312.3 Member Function Documentation

### 10.312.3.1 CharacterDataHandler()

```
virtual void gdcm::TableReader::CharacterDataHandler (
    const char * data,
    int length ) [virtual]
```

Reimplemented in [gdcm::XMLDictReader](#), and [gdcm::XMLPrivateDictReader](#).

### 10.312.3.2 EndElement()

```
virtual void gdcm::TableReader::EndElement (
    const char * name ) [virtual]
```

Reimplemented in [gdcm::XMLDictReader](#), and [gdcm::XMLPrivateDictReader](#).

### 10.312.3.3 GetDefs()

```
const Defs & gdcm::TableReader::GetDefs ( ) const [inline]
```

#### 10.312.3.4 GetFilename()

```
const char * gdcM::TableReader::GetFilename ( ) [inline]
```

#### 10.312.3.5 HandleIOD()

```
void gdcM::TableReader::HandleIOD (
    const char ** atts )
```

#### 10.312.3.6 HandleIODEntry()

```
void gdcM::TableReader::HandleIODEntry (
    const char ** atts )
```

#### 10.312.3.7 HandleMacro()

```
void gdcM::TableReader::HandleMacro (
    const char ** atts )
```

#### 10.312.3.8 HandleMacroEntry()

```
void gdcM::TableReader::HandleMacroEntry (
    const char ** atts )
```

#### 10.312.3.9 HandleMacroEntryDescription()

```
void gdcM::TableReader::HandleMacroEntryDescription (
    const char ** atts )
```

#### 10.312.3.10 HandleModule()

```
void gdcm::TableReader::HandleModule (
    const char ** atts )
```

#### 10.312.3.11 HandleModuleEntry()

```
void gdcm::TableReader::HandleModuleEntry (
    const char ** atts )
```

#### 10.312.3.12 HandleModuleEntryDescription()

```
void gdcm::TableReader::HandleModuleEntryDescription (
    const char ** atts )
```

#### 10.312.3.13 HandleModuleInclude()

```
void gdcm::TableReader::HandleModuleInclude (
    const char ** atts )
```

#### 10.312.3.14 Read()

```
int gdcm::TableReader::Read ( )
```

#### 10.312.3.15 SetFilename()

```
void gdcm::TableReader::SetFilename (
    const char * filename ) [inline]
```

### 10.312.3.16 StartElement()

```
virtual void gdcM::TableReader::StartElement (
    const char * name,
    const char ** atts ) [virtual]
```

Reimplemented in [gdcM::XMLDictReader](#), and [gdcM::XMLPrivateDictReader](#).

The documentation for this class was generated from the following file:

- [gdcMTableReader.h](#)

## 10.313 gdcM::network::TableRow Class Reference

```
#include <gdcMULTransitionTable.h>
```

Collaboration diagram for gdcM::network::TableRow:

### Public Member Functions

- [TableRow](#) ()
- [~TableRow](#) ()

### Public Attributes

- [Transition](#) \* [transitions](#) [[cMaxStateID](#)]

## 10.313.1 Constructor & Destructor Documentation

### 10.313.1.1 TableRow()

```
gdcM::network::TableRow::TableRow ( ) [inline]
```

References [gdcM::network::cMaxStateID](#), and [transitions](#).

### 10.313.1.2 ~TableRow()

```
gdcM::network::TableRow::~~TableRow ( ) [inline]
```

References [gdcM::network::cMaxStateID](#), and [transitions](#).

## 10.313.2 Member Data Documentation

### 10.313.2.1 transitions

`Transition*` `gdcm::network::TableRow::transitions[cMaxStateID]`

Referenced by `TableRow()`, and `~TableRow()`.

The documentation for this class was generated from the following file:

- `gdcmULTransitionTable.h`

## 10.314 gdcm::Tag Class Reference

Class to represent a DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#)).

```
#include <gdcmTag.h>
```

Inheritance diagram for `gdcm::Tag`:

### Public Member Functions

- [Tag](#) (const [Tag](#) &\_val)
- [Tag](#) (uint16\_t group, uint16\_t element)  
*Constructor with 2\*uint16\_t.*
- [Tag](#) (uint32\_t tag=0)  
*Constructor with 1\*uint32\_t Prefer the ctor that takes two uint16\_t.*
- uint16\_t [GetElement](#) () const  
*Returns the 'Element number' of the given Tag.*
- uint32\_t [GetElementTag](#) () const  
*Returns the full tag value of the given Tag.*
- uint16\_t [GetGroup](#) () const  
*Returns the 'Group number' of the given Tag.*
- uint32\_t [GetLength](#) () const  
*return the length of tag (read: size on disk)*
- [Tag](#) [GetPrivateCreator](#) () const  
*Return the Private Creator Data Element tag of a private data element.*
- bool [IsGroupLength](#) () const  
*return whether the tag correspond to a group length tag:*
- bool [IsGroupXX](#) (const [Tag](#) &t) const  
*e.g 6002,3000 belong to groupXX: 6000,3000*
- bool [IsIllegal](#) () const

- return if the tag is considered to be an illegal tag*
- bool `IsPrivate` () const
- bool `IsPrivateCreator` () const
- bool `IsPublic` () const
- bool `operator!=` (const `Tag` &\_val) const
- bool `operator<` (const `Tag` &\_val) const
- bool `operator<=` (const `Tag` &t2) const
- `Tag` & `operator=` (const `Tag` &\_val)
- bool `operator==` (const `Tag` &\_val) const
- uint16\_t & `operator[]` (const unsigned int &\_id)
- Returns the Group or Element of the given Tag, depending on id (0/1)*
- const uint16\_t & `operator[]` (const unsigned int &\_id) const
- Returns the Group or Element of the given Tag, depending on id (0/1)*
- std::string `PrintAsContinuousString` () const
- std::string `PrintAsContinuousUpperCaseString` () const
- Same as PrintAsContinuousString, but hexadecimal [a-f] are printed using upper case.*
- std::string `PrintAsPipeSeparatedString` () const
- template<typename TSwap >  
std::istream & `Read` (std::istream &is)
- Read a tag from binary representation.*
- bool `ReadFromCommaSeparatedString` (const char \*str)
- bool `ReadFromContinuousString` (const char \*str)
- bool `ReadFromPipeSeparatedString` (const char \*str)
- void `SetElement` (uint16\_t element)
- Sets the 'Element number' of the given Tag.*
- void `SetElementTag` (uint16\_t group, uint16\_t element)
- Sets the 'Group number' & 'Element number' of the given Tag.*
- void `SetElementTag` (uint32\_t tag)
- Sets the full tag value of the given Tag.*
- void `SetGroup` (uint16\_t group)
- Sets the 'Group number' of the given Tag.*
- void `SetPrivateCreator` (`Tag` const &t)
- Set private creator:*
- template<typename TSwap >  
const std::ostream & `Write` (std::ostream &os) const
- Write a tag in binary rep.*

## Friends

- std::ostream & `operator<<` (std::ostream &\_os, const `Tag` &\_val)
- std::istream & `operator>>` (std::istream &\_is, `Tag` &\_val)



### 10.314.1 Detailed Description

Class to represent a DICOM Data [Element](#) ([Attribute](#)) [Tag](#) (Group, [Element](#)).

Basically an uint32\_t which can also be expressed as two uint16\_t (group and element)

#### Note

DATA ELEMENT TAG: A unique identifier for a Data [Element](#) composed of an ordered pair of numbers (a Group Number followed by an [Element](#) Number). GROUP NUMBER: The first number in the ordered pair of numbers that makes up a Data [Element Tag](#). ELEMENT NUMBER: The second number in the ordered pair of numbers that makes up a Data [Element Tag](#).

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DumpToSQLITE3.cxx](#), [DumpVisusChange.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [ExtractEncapsulatedFile.cs](#), [ExtractEncryptedContent.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FileAnonymize.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GetJPEGSamplePrecision.cxx](#), [GetSequenceUltrasound.cxx](#), [GetSubSequenceData.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [PatchFile.cxx](#), [PublicDict.cxx](#), [ReadAndDumpDICOMDIR.cxx](#), [ReadAndDumpDICOMDIR2.cxx](#), [ReadAndPrintAttributes.cxx](#), [ReadExplicitLengthSQIVR.cxx](#), [ScanDirectory.cs](#), [SimpleScanner.cxx](#), [SortImage.cxx](#), [StreamImageReaderTest.cxx](#), [TraverseModules.cxx](#), [VolumeSorter.cxx](#), [gdcmrtionplan.cxx](#), [gdcmrtplan.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.314.2 Constructor & Destructor Documentation

#### 10.314.2.1 Tag() [1/3]

```
gdcm::Tag::Tag (
    uint16_t group,
    uint16_t element ) [inline]
```

Constructor with 2\*uint16\_t.

#### 10.314.2.2 Tag() [2/3]

```
gdcm::Tag::Tag (
    uint32_t tag = 0 ) [inline]
```

Constructor with 1\*uint32\_t Prefer the ctor that takes two uint16\_t.

### 10.314.2.3 Tag() [3/3]

```
gdcM::Tag::Tag (
    const Tag & _val ) [inline]
```

References [tag](#).

## 10.314.3 Member Function Documentation

### 10.314.3.1 GetElement()

```
uint16_t gdcM::Tag::GetElement ( ) const [inline]
```

Returns the 'Element number' of the given [Tag](#).

#### Examples

[DuplicatePCDE.cxx](#), and [PublicDict.cxx](#).

Referenced by [gdcM::PrivateTag::PrivateTag\(\)](#), [gdcM::DataSet::ComputeGroupLength\(\)](#), [IsGroupXX\(\)](#), [gdcM::PrivateDict::PrintXML\(\)](#), [gdcM::SequenceOfFragments::ReadValue\(\)](#), and [SetPrivateCreator\(\)](#).

### 10.314.3.2 GetElementTag()

```
uint32_t gdcM::Tag::GetElementTag ( ) const [inline]
```

Returns the full tag value of the given [Tag](#).

Referenced by [gdcM::PrivateTag::operator!=\(\)](#), [gdcM::PrivateTag::operator=\(\)](#), and [gdcM::PrivateTag::operator==\(\)](#).

### 10.314.3.3 GetGroup()

```
uint16_t gdcM::Tag::GetGroup ( ) const [inline]
```

Returns the 'Group number' of the given [Tag](#).

#### Examples

[DuplicatePCDE.cxx](#), and [GenAllVR.cxx](#).

Referenced by [gdcM::DataSet::ComputeGroupLength\(\)](#), [gdcM::DataSet::Insert\(\)](#), [gdcM::FileMetaInformation::Insert\(\)](#), [gdcM::CommandDataSet::Insert\(\)](#), [IsGroupXX\(\)](#), [gdcM::PrivateDict::PrintXML\(\)](#), [gdcM::SequenceOfFragments::ReadValue\(\)](#), and [SetPrivateCreator\(\)](#).

#### 10.314.3.4 GetLength()

```
uint32_t gdcm::Tag::GetLength ( ) const [inline]
```

return the length of tag (read: size on disk)

#### 10.314.3.5 GetPrivateCreator()

```
Tag gdcm::Tag::GetPrivateCreator ( ) const [inline]
```

Return the Private Creator Data [Element](#) tag of a private data element.

References [SetElement\(\)](#).

#### 10.314.3.6 IsGroupLength()

```
bool gdcm::Tag::IsGroupLength ( ) const [inline]
```

return whether the tag correspond to a group length tag:

#### 10.314.3.7 IsGroupXX()

```
bool gdcm::Tag::IsGroupXX (
    const Tag & t ) const [inline]
```

e.g 6002,3000 belong to groupXX: 6000,3000

References [GetElement\(\)](#), [GetGroup\(\)](#), and [IsPrivate\(\)](#).

#### 10.314.3.8 IsIllegal()

```
bool gdcm::Tag::IsIllegal ( ) const [inline]
```

return if the tag is considered to be an illegal tag

### 10.314.3.9 IsPrivate()

```
bool gdcM::Tag::IsPrivate ( ) const [inline]
```

PRIVATE DATA ELEMENT: Additional Data [Element](#), defined by an implementor, to communicate information that is not contained in Standard Data Elements. Private Data elements have odd Group Numbers.

#### Examples

[DuplicatePCDE.cxx](#).

Referenced by [IsGroupXX\(\)](#), and [SetPrivateCreator\(\)](#).

### 10.314.3.10 IsPrivateCreator()

```
bool gdcM::Tag::IsPrivateCreator ( ) const [inline]
```

Returns if tag is a Private Creator (xxxx,00yy), where xxxx is odd number and yy in [0x10,0xFF]

#### Examples

[DuplicatePCDE.cxx](#).

### 10.314.3.11 IsPublic()

```
bool gdcM::Tag::IsPublic ( ) const [inline]
```

STANDARD DATA ELEMENT: A Data [Element](#) defined in the DICOM Standard, and therefore listed in the DICOM Data [Element](#) Dictionary in PS 3.6. Is the [Tag](#) from the Public dict...well the implementation is buggy it does not prove the element is indeed in the dict...

### 10.314.3.12 operator!=( )

```
bool gdcM::Tag::operator!=(  
    const Tag & _val ) const [inline]
```

References [tag](#).

### 10.314.3.13 operator<()

```
bool gdcm::Tag::operator< (
    const Tag & _val ) const [inline]
```

DICOM Standard expects the Data [Element](#) to be sorted by Tags All other comparison can be constructed from this one and operator ==

References [tag](#), and [tags](#).

### 10.314.3.14 operator<=()

```
bool gdcm::Tag::operator<= (
    const Tag & t2 ) const [inline]
```

### 10.314.3.15 operator=()

```
Tag & gdcm::Tag::operator= (
    const Tag & _val ) [inline]
```

References [tag](#).

### 10.314.3.16 operator==()

```
bool gdcm::Tag::operator== (
    const Tag & _val ) const [inline]
```

References [tag](#).

### 10.314.3.17 operator[]() [1/2]

```
uint16_t & gdcm::Tag::operator[] (
    const unsigned int & _id ) [inline]
```

Returns the Group or [Element](#) of the given [Tag](#), depending on id (0/1)

**10.314.3.18 operator[]()** [2/2]

```
const uint16_t & gdcM::Tag::operator[] (
    const unsigned int & _id ) const [inline]
```

Returns the Group or [Element](#) of the given [Tag](#), depending on id (0/1)

**10.314.3.19 PrintAsContinuousString()**

```
std::string gdcM::Tag::PrintAsContinuousString ( ) const
```

Print tag value with no separating comma: eg. tag = "12345678" It comes in useful when reading tag values from XML file(in NativeDICOMModel)

**10.314.3.20 PrintAsContinuousUpperCaseString()**

```
std::string gdcM::Tag::PrintAsContinuousUpperCaseString ( ) const
```

Same as PrintAsContinuousString, but hexadecimal [a-f] are printed using upper case.

**10.314.3.21 PrintAsPipeSeparatedString()**

```
std::string gdcM::Tag::PrintAsPipeSeparatedString ( ) const
```

Print as a pipe separated string (GDCM 1.x compat only). Do not use in newer code

See also

[ReadFromPipeSeparatedString](#)

**10.314.3.22 Read()**

```
template<typename TSwap >
std::istream & gdcM::Tag::Read (
    std::istream & is ) [inline]
```

Read a tag from binary representation.

### 10.314.3.23 ReadFromCommaSeparatedString()

```
bool gdcm::Tag::ReadFromCommaSeparatedString (
    const char * str )
```

Read from a comma separated string. This is a highly user oriented function, the string should be formatted as ← : 1234,5678 to specify the tag (0x1234,0x5678) The notation comes from the DICOM standard, and is handy to use from a command line program

### 10.314.3.24 ReadFromContinuousString()

```
bool gdcm::Tag::ReadFromContinuousString (
    const char * str )
```

Read From XML formatted tag value eg. tag = "12345678" It comes in useful when reading tag values from XML file(in NativeDICOMModel)

### 10.314.3.25 ReadFromPipeSeparatedString()

```
bool gdcm::Tag::ReadFromPipeSeparatedString (
    const char * str )
```

Read from a pipe separated string (GDCM 1.x compat only). Do not use in newer code

See also

[ReadFromCommaSeparatedString](#)

### 10.314.3.26 SetElement()

```
void gdcm::Tag::SetElement (
    uint16_t element ) [inline]
```

Sets the '[Element](#) number' of the given [Tag](#).

Examples

[DuplicatePCDE.cxx](#), and [PublicDict.cxx](#).

Referenced by [GetPrivateCreator\(\)](#).

**10.314.3.27 SetElementTag()** [1/2]

```
void gdcM::Tag::SetElementTag (
    uint16_t group,
    uint16_t element ) [inline]
```

Sets the 'Group number' & 'Element number' of the given [Tag](#).

**10.314.3.28 SetElementTag()** [2/2]

```
void gdcM::Tag::SetElementTag (
    uint32_t tag ) [inline]
```

Sets the full tag value of the given [Tag](#).

**10.314.3.29 SetGroup()**

```
void gdcM::Tag::SetGroup (
    uint16_t group ) [inline]
```

Sets the 'Group number' of the given [Tag](#).

**10.314.3.30 SetPrivateCreator()**

```
void gdcM::Tag::SetPrivateCreator (
    Tag const & t ) [inline]
```

Set private creator:

**Examples**

[DuplicatePCDE.cxx](#).

References [GetElement\(\)](#), [GetGroup\(\)](#), and [IsPrivate\(\)](#).



### 10.314.3.31 Write()

```
template<typename TSwap >
const std::ostream & gdcm::Tag::Write (
    std::ostream & os ) const [inline]
```

Write a tag in binary rep.

Referenced by [gdcm::Item::Write\(\)](#), [gdcm::SequenceOfFragments::Write\(\)](#), and [gdcm::SequenceOfItems::Write\(\)](#).

## 10.314.4 Friends And Related Function Documentation

### 10.314.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Tag & _val ) [friend]
```

### 10.314.4.2 operator>>

```
std::istream & operator>> (
    std::istream & _is,
    Tag & _val ) [friend]
```

## 10.314.5 Member Data Documentation

### 10.314.5.1 bytes

```
char gdcm::Tag::bytes[4]
```

### 10.314.5.2 tag

```
uint32_t gdcm::Tag::tag
```

Referenced by [Tag\(\)](#), [operator!=\(\)](#), [operator<\(\)](#), [operator=\(\)](#), and [operator==\(\)](#).

### 10.314.5.3 tags

```
uint16_t gdcM::Tag::tags[2]
```

Referenced by [operator<\(\)](#).

The documentation for this class was generated from the following file:

- [gdcMTag.h](#)

## 10.315 gdcM::TagPath Class Reference

class to handle a path of tag.

```
#include <gdcMTagPath.h>
```

### Public Member Functions

- [TagPath](#) ()
- [~TagPath](#) ()
- bool [ConstructFromString](#) (const char \*path)
- bool [ConstructFromTagList](#) ([Tag](#) const \*l, unsigned int n)  
*Construct from a list of tags.*
- void [Print](#) (std::ostream &) const
- bool [Push](#) ([Tag](#) const &t)
- bool [Push](#) (unsigned int itemnum)

### Static Public Member Functions

- static bool [IsValid](#) (const char \*path)  
*Return if path is valid or not.*

### 10.315.1 Detailed Description

class to handle a path of tag.

Any Resemblance to Existing XPath is Purely Coincidental [ftp://medical.nema.org/medical/dicom/supps/sup118←\\_pc.pdf](ftp://medical.nema.org/medical/dicom/supps/sup118/_pc.pdf)

### 10.315.2 Constructor & Destructor Documentation

### 10.315.2.1 TagPath()

```
gdcm::TagPath::TagPath ( )
```

### 10.315.2.2 ~TagPath()

```
gdcm::TagPath::~~TagPath ( )
```

## 10.315.3 Member Function Documentation

### 10.315.3.1 ConstructFromString()

```
bool gdcm::TagPath::ConstructFromString (
    const char * path )
```

"/0018,0018/"... No space allowed, comma is use to separate tag group from tag element and slash is used to separate tag return false if invalid

### 10.315.3.2 ConstructFromTagList()

```
bool gdcm::TagPath::ConstructFromTagList (
    Tag const * l,
    unsigned int n )
```

Construct from a list of tags.

### 10.315.3.3 IsValid()

```
static bool gdcm::TagPath::IsValid (
    const char * path ) [static]
```

Return if path is valid or not.

#### 10.315.3.4 Print()

```
void gdcM::TagPath::Print (
    std::ostream & ) const
```

#### 10.315.3.5 Push() [1/2]

```
bool gdcM::TagPath::Push (
    Tag const & t )
```

#### 10.315.3.6 Push() [2/2]

```
bool gdcM::TagPath::Push (
    unsigned int itemnum )
```

The documentation for this class was generated from the following file:

- [gdcMTagPath.h](#)

## 10.316 gdcM::Testing Class Reference

class for testing

```
#include <gdcMTesting.h>
```

### Public Types

- typedef const char \*const (\* [MD5DataImagesType](#))[2]
- typedef const char \*const (\* [MediaStorageDataFilesType](#))[2]  
*return the table that map the media storage (as string) of a filename (gdcMData)*

### Public Member Functions

- [Testing](#) ()=default
- [~Testing](#) ()=default
- void [Print](#) (std::ostream &os=std::cout)  
*Print.*

## Static Public Member Functions

- static bool [ComputeFileMD5](#) (const char \*filename, char digest\_str[33])
- static bool [ComputeMD5](#) (const char \*buffer, size\_t buf\_len, char digest\_str[33])
- static const char \* [GetDataExtraRoot](#) ()  
*Return the GDCM DATA EXTRA ROOT.*
- static const char \* [GetDataRoot](#) ()  
*Return the GDCM DATA ROOT.*
- static const char \* [GetFileName](#) (unsigned int file)
- static const char \*const \* [GetFileNames](#) ()  
*return the table of fullpath to gdcmData DICOM files:*
- static int [GetLossyFlagFromFile](#) (const char \*filepath)
- static const char \*const \* [GetMD5DataImage](#) (unsigned int file)
- static [MD5DataImagesType](#) [GetMD5DataImages](#) ()
- static const char \* [GetMD5FromBrokenFile](#) (const char \*filepath)
- static const char \* [GetMD5FromFile](#) (const char \*filepath)
- static const char \*const \* [GetMediaStorageDataFile](#) (unsigned int file)
- static [MediaStorageDataFilesType](#) [GetMediaStorageDataFiles](#) ()
- static const char \* [GetMediaStorageFromFile](#) (const char \*filepath)
- static unsigned int [GetNumberOfFileNames](#) ()
- static unsigned int [GetNumberOfMD5DataImages](#) ()
- static unsigned int [GetNumberOfMediaStorageDataFiles](#) ()
- static const char \* [GetPixelSpacingDataRoot](#) ()  
*Return the GDCM PIXEL SPACING DATA ROOT (See David Clunie website for dataset)*
- static std::streamoff [GetSelectedPrivateGroupOffsetFromFile](#) (const char \*filepath)
- static std::streamoff [GetSelectedTagsOffsetFromFile](#) (const char \*filepath)
- static const char \* [GetSourceDirectory](#) ()
- static std::streamoff [GetStreamOffsetFromFile](#) (const char \*filepath)
- static const char \* [GetTempDirectory](#) (const char \*subdir=nullptr)
- static const wchar\_t \* [GetTempDirectoryW](#) (const wchar\_t \*subdir=nullptr)  
*NOT THREAD SAFE.*
- static const char \* [GetTempFilename](#) (const char \*filename, const char \*subdir=nullptr)  
*NOT THREAD SAFE.*
- static const wchar\_t \* [GetTempFilenameW](#) (const wchar\_t \*filename, const wchar\_t \*subdir=nullptr)  
*NOT THREAD SAFE.*

### 10.316.1 Detailed Description

class for testing

this class is used for the nightly regression system for GDCM It makes heavily use of md5 computation

See also

[gdcm::MD5](#) class for md5 computation

## 10.316.2 Member Typedef Documentation

### 10.316.2.1 MD5DataImagesType

```
typedef const char* const (* gdcm::Testing::MD5DataImagesType) [2]
```

return the table that map the md5 (as in md5sum) of the Pixel Data associated to a filename

### 10.316.2.2 MediaStorageDataFileType

```
typedef const char* const (* gdcm::Testing::MediaStorageDataFileType) [2]
```

return the table that map the media storage (as string) of a filename (gdcmData)

## 10.316.3 Constructor & Destructor Documentation

### 10.316.3.1 Testing()

```
gdcm::Testing::Testing ( ) [default]
```

### 10.316.3.2 ~Testing()

```
gdcm::Testing::~~Testing ( ) [default]
```

## 10.316.4 Member Function Documentation

### 10.316.4.1 ComputeFileMD5()

```
static bool gdcm::Testing::ComputeFileMD5 (
    const char * filename,
    char digest_str[33] ) [static]
```

#### Examples

[MetaImageMD5Activiz.cs](#).

#### 10.316.4.2 ComputeMD5()

```
static bool gdcmm::Testing::ComputeMD5 (
    const char * buffer,
    size_t buf_len,
    char digest_str[33] ) [static]
```

[MD5](#) stuff *digest\_str* needs to be at least : `strlen = [2*16+1]`; string will be \0 padded. (md5 are 32 bytes long) [Testing](#) is not meant to be shipped with an installed GDCM release, always prefer the [gdcmm::MD5](#) API when doing md5 computation.

#### 10.316.4.3 GetDataExtraRoot()

```
static const char * gdcmm::Testing::GetDataExtraRoot ( ) [static]
```

Return the GDCM DATA EXTRA ROOT.

##### Examples

[DiscriminateVolume.cxx](#), [VolumeSorter.cxx](#), and [reslicesphere.cxx](#).

#### 10.316.4.4 GetDataRoot()

```
static const char * gdcmm::Testing::GetDataRoot ( ) [static]
```

Return the GDCM DATA ROOT.

##### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), and [MagnifyFile.cxx](#).

#### 10.316.4.5 GetFileName()

```
static const char * gdcmm::Testing::GetFileName (
    unsigned int file ) [static]
```

##### Examples

[MetalImageMD5Activiz.cs](#).

#### 10.316.4.6 GetFileNames()

```
static const char *const * gdcM::Testing::GetFileNames ( ) [static]
```

return the table of fullpath to gdcMData DICOM files:

##### Examples

[TestReader.cxx](#).

#### 10.316.4.7 GetLossyFlagFromFile()

```
static int gdcM::Testing::GetLossyFlagFromFile (
    const char * filepath ) [static]
```

Return the lossy flag of the given filename -1 -> Error 0 -> Lossless 1 -> Lossy

#### 10.316.4.8 GetMD5DataImage()

```
static const char *const * gdcM::Testing::GetMD5DataImage (
    unsigned int file ) [static]
```

#### 10.316.4.9 GetMD5DataImages()

```
static MD5DataImagesType gdcM::Testing::GetMD5DataImages ( ) [static]
```

#### 10.316.4.10 GetMD5FromBrokenFile()

```
static const char * gdcM::Testing::GetMD5FromBrokenFile (
    const char * filepath ) [static]
```

Return what should have been the md5 of file 'filepath' This is based on current GDCM implementation to decipher a broken DICOM file.

#### 10.316.4.11 GetMD5FromFile()

```
static const char * gdcM::Testing::GetMD5FromFile (
    const char * filepath ) [static]
```



**10.316.4.12 GetMediaStorageDataFile()**

```
static const char *const * gdcm::Testing::GetMediaStorageDataFile (
    unsigned int file ) [static]
```

**10.316.4.13 GetMediaStorageDataFiles()**

```
static MediaStorageDataFileType gdcm::Testing::GetMediaStorageDataFiles ( ) [static]
```

**10.316.4.14 GetMediaStorageFromFile()**

```
static const char * gdcm::Testing::GetMediaStorageFromFile (
    const char * filepath ) [static]
```

**Examples**

[MetaImageMD5Activiz.cs](#), and [TestReader.cxx](#).

**10.316.4.15 GetNumberOfFileNames()**

```
static unsigned int gdcm::Testing::GetNumberOfFileNames ( ) [static]
```

**Examples**

[MetaImageMD5Activiz.cs](#).

**10.316.4.16 GetNumberOfMD5DataImages()**

```
static unsigned int gdcm::Testing::GetNumberOfMD5DataImages ( ) [static]
```

**10.316.4.17 GetNumberOfMediaStorageDataFiles()**

```
static unsigned int gdcm::Testing::GetNumberOfMediaStorageDataFiles ( ) [static]
```

**10.316.4.18 GetPixelSpacingDataRoot()**

```
static const char * gdcm::Testing::GetPixelSpacingDataRoot ( ) [static]
```

Return the GDCM PIXEL SPACING DATA ROOT (See David Clunie website for dataset)

**10.316.4.19 GetSelectedPrivateGroupOffsetFromFile()**

```
static std::streamoff gdcm::Testing::GetSelectedPrivateGroupOffsetFromFile (
    const char * filepath ) [static]
```

Return the offset just after private attribute (0009,0010,"GEMS\_IDEN\_01") if found. Otherwise the offset of the next attribute -1 if not found

**10.316.4.20 GetSelectedTagsOffsetFromFile()**

```
static std::streamoff gdcm::Testing::GetSelectedTagsOffsetFromFile (
    const char * filepath ) [static]
```

Return the offset just after Pixel Data Length (7fe0,0000) if found. Otherwise the offset of the very first pixel cell in Pixel Data -1 if not found

**10.316.4.21 GetSourceDirectory()**

```
static const char * gdcm::Testing::GetSourceDirectory ( ) [static]
```

**Examples**

[BasicAnonymizer.cs](#), and [ClinicalTrialIdentificationWorkflow.cs](#).

**10.316.4.22 GetStreamOffsetFromFile()**

```
static std::streamoff gdcm::Testing::GetStreamOffsetFromFile (
    const char * filepath ) [static]
```

Return the offset of the very first pixel cell in the PixelData -1 if not found

#### 10.316.4.23 GetTempDirectory()

```
static const char * gdcmm::Testing::GetTempDirectory (
    const char * subdir = nullptr ) [static]
```

NOT THREAD SAFE Returns the temp directory as used in testing needing to output data:

##### Examples

[MetalImageMD5Activiz.cs](#).

#### 10.316.4.24 GetTempDirectoryW()

```
static const wchar_t * gdcmm::Testing::GetTempDirectoryW (
    const wchar_t * subdir = nullptr ) [static]
```

NOT THREAD SAFE.

#### 10.316.4.25 GetTempFilename()

```
static const char * gdcmm::Testing::GetTempFilename (
    const char * filename,
    const char * subdir = nullptr ) [static]
```

NOT THREAD SAFE.

##### Examples

[MetalImageMD5Activiz.cs](#).

#### 10.316.4.26 GetTempFilenameW()

```
static const wchar_t * gdcmm::Testing::GetTempFilenameW (
    const wchar_t * filename,
    const wchar_t * subdir = nullptr ) [static]
```

NOT THREAD SAFE.

**10.316.4.27 Print()**

```
void gdcM::Testing::Print (
    std::ostream & os = std::cout )
```

Print.

The documentation for this class was generated from the following file:

- [gdcMTesting.h](#)

**10.317 gdcM::Trace Class Reference**

[Trace](#).

```
#include <gdcMTrace.h>
```

**Public Member Functions**

- [Trace](#) ()
- [~Trace](#) ()

**Static Public Member Functions**

- static void [DebugOff](#) ()
- static void [DebugOn](#) ()
- static void [ErrorOff](#) ()
- static void [ErrorOn](#) ()
- static bool [GetDebugFlag](#) ()
- static std::ostream & [GetDebugStream](#) ()
- static bool [GetErrorFlag](#) ()
- static std::ostream & [GetErrorStream](#) ()
- static std::ostream & [GetStream](#) ()
- static bool [GetWarningFlag](#) ()
- static std::ostream & [GetWarningStream](#) ()
- static void [SetDebug](#) (bool debug)
  - Turn debug messages on (default: false)*
- static void [SetDebugStream](#) (std::ostream &os)
  - Explicitly set the stream which receive Debug messages:*
- static void [SetError](#) (bool debug)
  - Turn error messages on (default: true)*
- static void [SetErrorStream](#) (std::ostream &os)
  - Explicitly set the stream which receive Error messages:*
- static void [SetStream](#) (std::ostream &os)
- static void [SetStreamToFile](#) (const char \*filename)
- static void [SetWarning](#) (bool debug)
  - Turn warning messages on (default: true)*
- static void [SetWarningStream](#) (std::ostream &os)
  - Explicitly set the stream which receive Warning messages:*
- static void [WarningOff](#) ()
- static void [WarningOn](#) ()

## 10.317.1 Detailed Description

[Trace](#).

Debug / Warning and Error are encapsulated in this class by default the [Trace](#) class will redirect any debug/warning/error to `std::cerr`. Unless `SetStream` was specified with another (open) stream or `SetStreamToFile` was specified to a writable file on the system.

### Warning

All string messages are removed during compilation time when compiled with `CMAKE_BUILD_TYPE` being set to either:

- Release
- MinSizeRel It is recommended to compile with `RelWithDebInfo` and/or `Debug` during prototyping of applications.

### Examples

[DecompressJPEGFile.cs](#).

## 10.317.2 Constructor & Destructor Documentation

### 10.317.2.1 Trace()

```
gdcm::Trace::Trace ( )
```

### 10.317.2.2 ~Trace()

```
gdcm::Trace::~~Trace ( )
```

## 10.317.3 Member Function Documentation

### 10.317.3.1 DebugOff()

```
static void gdcm::Trace::DebugOff ( ) [static]
```

### Examples

[MetImageMD5Activiz.cs](#), and [TestReader.cxx](#).

### 10.317.3.2 DebugOn()

```
static void gdcm::Trace::DebugOn ( ) [static]
```

#### Examples

[CreateFakePET.cxx](#), [DecompressJPEGFile.cs](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

### 10.317.3.3 ErrorOff()

```
static void gdcm::Trace::ErrorOff ( ) [static]
```

#### Examples

[MetaImageMD5Activiz.cs](#).

### 10.317.3.4 ErrorOn()

```
static void gdcm::Trace::ErrorOn ( ) [static]
```

### 10.317.3.5 GetDebugFlag()

```
static bool gdcm::Trace::GetDebugFlag ( ) [static]
```

### 10.317.3.6 GetDebugStream()

```
static std::ostream & gdcm::Trace::GetDebugStream ( ) [static]
```

### 10.317.3.7 GetErrorFlag()

```
static bool gdcm::Trace::GetErrorFlag ( ) [static]
```

### 10.317.3.8 GetErrorStream()

```
static std::ostream & gdcm::Trace::GetErrorStream ( ) [static]
```

### 10.317.3.9 GetStream()

```
static std::ostream & gdcm::Trace::GetStream ( ) [static]
```

### 10.317.3.10 GetWarningFlag()

```
static bool gdcm::Trace::GetWarningFlag ( ) [static]
```

### 10.317.3.11 GetWarningStream()

```
static std::ostream & gdcm::Trace::GetWarningStream ( ) [static]
```

### 10.317.3.12 SetDebug()

```
static void gdcm::Trace::SetDebug (
    bool debug ) [static]
```

Turn debug messages on (default: false)

#### Examples

[DumpToSQLITE3.cxx](#).

### 10.317.3.13 SetDebugStream()

```
static void gdcm::Trace::SetDebugStream (
    std::ostream & os ) [static]
```

Explicitly set the stream which receive Debug messages:

#### 10.317.3.14 SetError()

```
static void gdcm::Trace::SetError (
    bool debug ) [static]
```

Turn error messages on (default: true)

#### 10.317.3.15 SetErrorStream()

```
static void gdcm::Trace::SetErrorStream (
    std::ostream & os ) [static]
```

Explicitly set the stream which receive Error messages:

##### Examples

[CStoreQtProgress.cxx](#).

#### 10.317.3.16 SetStream()

```
static void gdcm::Trace::SetStream (
    std::ostream & os ) [static]
```

Explicitly set the ostream for [gdcm::Trace](#) to report to This will set the DebugStream, WarningStream and ErrorStream at once:

#### 10.317.3.17 SetStreamToFile()

```
static void gdcm::Trace::SetStreamToFile (
    const char * filename ) [static]
```

Explicitly set the filename for [gdcm::Trace](#) to report to The file will be created (it will not append to existing file)

#### 10.317.3.18 SetWarning()

```
static void gdcm::Trace::SetWarning (
    bool debug ) [static]
```

Turn warning messages on (default: true)

##### Examples

[DumpToSQLITE3.cxx](#).



### 10.317.3.19 SetWarningStream()

```
static void gdcm::Trace::SetWarningStream (
    std::ostream & os ) [static]
```

Explicitly set the stream which receive Warning messages:

### 10.317.3.20 WarningOff()

```
static void gdcm::Trace::WarningOff ( ) [static]
```

#### Examples

[MetalImageMD5Activiz.cs](#), and [TestReader.cxx](#).

### 10.317.3.21 WarningOn()

```
static void gdcm::Trace::WarningOn ( ) [static]
```

#### Examples

[Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), and [StreamImageReaderTest.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmTrace.h](#)

## 10.318 gdcm::TransferSyntax Class Reference

Class to manipulate Transfer Syntax.

```
#include <gdcmTransferSyntax.h>
```

## Public Types

- enum [NegociatedType](#) {  
    [Unknown](#) = 0 ,  
    [Explicit](#) ,  
    [Implicit](#) }
- enum [TSType](#) {  
    [ImplicitVRLittleEndian](#) = 0 ,  
    [ImplicitVRBigEndianPrivateGE](#) ,  
    [ExplicitVRLittleEndian](#) ,  
    [DeflatedExplicitVRLittleEndian](#) ,  
    [ExplicitVRBigEndian](#) ,  
    [JPEGBaselineProcess1](#) ,  
    [JPEGExtendedProcess2\\_4](#) ,  
    [JPEGExtendedProcess3\\_5](#) ,  
    [JPEGSpectralSelectionProcess6\\_8](#) ,  
    [JPEGFullProgressionProcess10\\_12](#) ,  
    [JPEGLosslessProcess14](#) ,  
    [JPEGLosslessProcess14\\_1](#) ,  
    [JPEGLSLossless](#) ,  
    [JPEGLSNearLossless](#) ,  
    [JPEG2000Lossless](#) ,  
    [JPEG2000](#) ,  
    [JPEG2000Part2Lossless](#) ,  
    [JPEG2000Part2](#) ,  
    [RLELossless](#) ,  
    [MPEG2MainProfile](#) ,  
    [ImplicitVRBigEndianACRNEMA](#) ,  
    [WeirdPapryus](#) ,  
    [CT\\_private\\_ELE](#) ,  
    [JPIPReferenced](#) ,  
    [MPEG2MainProfileHighLevel](#) ,  
    [MPEG4AVCH264HighProfileLevel4\\_1](#) ,  
    [MPEG4AVCH264BDcompatibleHighProfileLevel4\\_1](#) ,  
    [TS\\_END](#) }

## Public Member Functions

- [TransferSyntax](#) ([TSType](#) type=[ImplicitVRLittleEndian](#))
- bool [CanStoreLossy](#) () const
- [NegociatedType](#) [GetNegociatedType](#) () const
- const char \* [GetString](#) () const
- [SwapCode](#) [GetSwapCode](#) () const
- bool [IsEncapsulated](#) () const
- bool [IsEncoded](#) () const
- bool [IsExplicit](#) () const
- bool [IsImplicit](#) () const
- bool [IsLossless](#) () const
- bool [IsLossy](#) () const
- bool [IsValid](#) () const
- operator [TSType](#) () const

## Static Public Member Functions

- static const char \* [GetTSSString](#) (TSType ts)
- static TSType [GetTSType](#) (const char \*str)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [TransferSyntax](#) &ts)

## 10.318.1 Detailed Description

Class to manipulate Transfer Syntax.

### Note

TRANSFER SYNTAX (Standard and Private): A set of encoding rules that allow Application Entities to unambiguously negotiate the encoding techniques (e.g., Data [Element](#) structure, byte ordering, compression) they are able to support, thereby allowing these Application Entities to communicate.

**Todo** : The implementation is completely retarded -> see [gdcm::UIDs](#) for a replacement We need: IsSupported We need preprocess of raw/xml file We need GetFullName()

Need a notion of Private Syntax. As defined in PS 3.5. Section 9.2

### See also

[UIDs](#)

### Examples

[BasicImageAnonymizer.cs](#), [CompressLossyJPEG.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [GetJPEGSamplePrecision.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [MpegVideoInfo.cs](#), and [StandardizeFiles.cs](#).

## 10.318.2 Member Enumeration Documentation

### 10.318.2.1 NegotiatedType

```
enum gdcm::TransferSyntax::NegociatedType
```

#### Enumerator

Unknown	
Explicit	
Implicit	

### 10.318.2.2 TSType

```
enum gdcmm::TransferSyntax::TSType
```

#### Enumerator

ImplicitVRLittleEndian	
ImplicitVRBigEndianPrivateGE	
ExplicitVRLittleEndian	
DeflatedExplicitVRLittleEndian	
ExplicitVRBigEndian	
JPEGBaselineProcess1	
JPEGExtendedProcess2_4	
JPEGExtendedProcess3_5	
JPEGSpectralSelectionProcess6_8	
JPEGFullProgressionProcess10_12	
JPEGLosslessProcess14	
JPEGLosslessProcess14_1	
JPEGLSLossless	
JPEGLSNearLossless	
JPEG2000Lossless	
JPEG2000	
JPEG2000Part2Lossless	
JPEG2000Part2	
RLELossless	
MPEG2MainProfile	
ImplicitVRBigEndianACRNEMA	
WeirdPapryus	
CT_private_ELE	
JPIPReferenced	
MPEG2MainProfileHighLevel	
MPEG4AVCH264HighProfileLevel4_1	
MPEG4AVCH264BDcompatibleHighProfileLevel4↔ _1	
TS_END	

#### Examples

[BasicImageAnonymizer.cs](#), [CompressLossyJPEG.cs](#), [DecompressImageMultiframe.cs](#), [DecompressJPEGFile.cs](#), [FileChangeTS.cs](#), [FileChangeTSLossy.cs](#), [MpegVideoInfo.cs](#), and [StandardizeFiles.cs](#).

### 10.318.3 Constructor & Destructor Documentation

### 10.318.3.1 TransferSyntax()

```
gdcm::TransferSyntax::TransferSyntax (
    TSType type = ImplicitVRLittleEndian ) [inline]
```

## 10.318.4 Member Function Documentation

### 10.318.4.1 CanStoreLossy()

```
bool gdcm::TransferSyntax::CanStoreLossy ( ) const
```

return true if TransFer Syntax Allow storing of Lossy Pixel Data

### 10.318.4.2 GetNegociatedType()

```
NegociatedType gdcm::TransferSyntax::GetNegociatedType ( ) const
```

### 10.318.4.3 GetString()

```
const char * gdcm::TransferSyntax::GetString ( ) const [inline]
```

References [GetTSString\(\)](#).

### 10.318.4.4 GetSwapCode()

```
SwapCode gdcm::TransferSyntax::GetSwapCode ( ) const
```

**Deprecated** Return the [SwapCode](#) associated with the Transfer Syntax. Be careful with the special GE private syntax the [DataSet](#) is written in little endian but the Pixel Data is in Big Endian.

#### 10.318.4.5 GetTSString()

```
static const char * gdcm::TransferSyntax::GetTSString (
    TSType ts ) [static]
```

##### Examples

[LargeVRDSExplicit.cxx](#).

Referenced by [GetString\(\)](#).

#### 10.318.4.6 GetTSType()

```
static TSType gdcm::TransferSyntax::GetTSType (
    const char * str ) [static]
```

#### 10.318.4.7 IsEncapsulated()

```
bool gdcm::TransferSyntax::IsEncapsulated ( ) const
```

##### Examples

[ExtractIconFromFile.cxx](#).

#### 10.318.4.8 IsEncoded()

```
bool gdcm::TransferSyntax::IsEncoded ( ) const
```

#### 10.318.4.9 IsExplicit()

```
bool gdcm::TransferSyntax::IsExplicit ( ) const
```

#### 10.318.4.10 IsImplicit()

```
bool gdcm::TransferSyntax::IsImplicit ( ) const
```

#### 10.318.4.11 IsLossless()

```
bool gdcm::TransferSyntax::IsLossless ( ) const
```

Return true if the transfer syntax algorithm is a lossless algorithm

#### 10.318.4.12 IsLossy()

```
bool gdcm::TransferSyntax::IsLossy ( ) const
```

Return true if the transfer syntax algorithm is a lossy algorithm

#### 10.318.4.13 IsValid()

```
bool gdcm::TransferSyntax::IsValid ( ) const [inline]
```

#### 10.318.4.14 operator TType()

```
gdcm::TransferSyntax::operator TType ( ) const [inline]
```

### 10.318.5 Friends And Related Function Documentation

#### 10.318.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const TransferSyntax & ts ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmTransferSyntax.h](#)

## 10.319 gdcm::network::TransferSyntaxSub Class Reference

[TransferSyntaxSub](#).

```
#include <gdcmTransferSyntaxSub.h>
```

### Public Member Functions

- [TransferSyntaxSub](#) ()
- const char \* [GetName](#) () const
- bool [operator==](#) (const [TransferSyntaxSub](#) &ts) const
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- void [SetName](#) (const char \*name)
- void [SetNameFromUID](#) (UIDs::TSName tsname)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.319.1 Detailed Description

[TransferSyntaxSub](#).

[Table](#) 9-15 TRANSFER SYNTAX SUB-ITEM FIELDS

TODO what is the goal of :

[Table](#) 9-19 TRANSFER SYNTAX SUB-ITEM FIELDS

### 10.319.2 Constructor & Destructor Documentation

#### 10.319.2.1 TransferSyntaxSub()

```
gdcm::network::TransferSyntaxSub::TransferSyntaxSub ( )
```

### 10.319.3 Member Function Documentation



### 10.319.3.1 GetName()

```
const char * gdcm::network::TransferSyntaxSub::GetName ( ) const [inline]
```

### 10.319.3.2 operator==(

```
bool gdcm::network::TransferSyntaxSub::operator== (
    const TransferSyntaxSub & ts ) const [inline]
```

### 10.319.3.3 Print()

```
void gdcm::network::TransferSyntaxSub::Print (
    std::ostream & os ) const
```

### 10.319.3.4 Read()

```
std::istream & gdcm::network::TransferSyntaxSub::Read (
    std::istream & is )
```

### 10.319.3.5 SetName()

```
void gdcm::network::TransferSyntaxSub::SetName (
    const char * name )
```

### 10.319.3.6 SetNameFromUID()

```
void gdcm::network::TransferSyntaxSub::SetNameFromUID (
    UIDs::TSName tsname )
```

### 10.319.3.7 Size()

```
size_t gdcn::network::TransferSyntaxSub::Size ( ) const
```

### 10.319.3.8 Write()

```
const std::ostream & gdcn::network::TransferSyntaxSub::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcnTransferSyntaxSub.h](#)

## 10.320 gdcn::network::Transition Struct Reference

```
#include <gdcnULTransitionTable.h>
```

Collaboration diagram for gdcn::network::Transition:

### Public Member Functions

- [Transition](#) ()
- [Transition](#) (int inEndState, [ULAction](#) \*inAction)
- [~Transition](#) ()

### Static Public Member Functions

- static [Transition](#) \* [MakeNew](#) (int inEndState, [ULAction](#) \*inAction)

### Public Attributes

- [ULAction](#) \* [mAction](#)
- int [mEnd](#)

### 10.320.1 Constructor & Destructor Documentation

### 10.320.1.1 Transition() [1/2]

```
gdcm::network::Transition::Transition ( ) [inline]
```

References [gdcm::network::eStaDoesNotExist](#), [mAction](#), and [mEnd](#).

Referenced by [MakeNew\(\)](#).

### 10.320.1.2 ~Transition()

```
gdcm::network::Transition::~~Transition ( ) [inline]
```

References [mAction](#).

### 10.320.1.3 Transition() [2/2]

```
gdcm::network::Transition::Transition (
    int inEndState,
    ULAction * inAction ) [inline]
```

References [mAction](#), and [mEnd](#).

## 10.320.2 Member Function Documentation

### 10.320.2.1 MakeNew()

```
static Transition * gdcm::network::Transition::MakeNew (
    int inEndState,
    ULAction * inAction ) [inline], [static]
```

References [Transition\(\)](#).

## 10.320.3 Member Data Documentation

### 10.320.3.1 mAction

`ULAction* gdcmm::network::Transition::mAction`

Referenced by [Transition\(\)](#), and [~Transition\(\)](#).

### 10.320.3.2 mEnd

`int gdcmm::network::Transition::mEnd`

Referenced by [Transition\(\)](#).

The documentation for this struct was generated from the following file:

- [gdcmmULTransitionTable.h](#)

## 10.321 gdcmm::Type Class Reference

[Type](#).

```
#include <gdcmmType.h>
```

### Public Types

- enum [TypeType](#) {  
    [T1](#) = 0 ,  
    [T1C](#) ,  
    [T2](#) ,  
    [T2C](#) ,  
    [T3](#) ,  
    [UNKNOWN](#) }

### Public Member Functions

- [Type](#) ([TypeType](#) type=[UNKNOWN](#))
- [operator TypeType](#) () const

### Static Public Member Functions

- static const char \* [GetTypeString](#) ([TypeType](#) type)
- static [TypeType](#) [GetTypeType](#) (const char \*type)

## Friends

- `std::ostream & operator<< (std::ostream &os, const Type &vr)`

### 10.321.1 Detailed Description

[Type](#).

#### Note

PS 3.5 7.4 DATA ELEMENT TYPE 7.4.1 TYPE 1 REQUIRED DATA ELEMENTS 7.4.2 TYPE 1C CONDITIONAL DATA ELEMENTS 7.4.3 TYPE 2 REQUIRED DATA ELEMENTS 7.4.4 TYPE 2C CONDITIONAL DATA ELEMENTS 7.4.5 TYPE 3 OPTIONAL DATA ELEMENTS

The intent of [Type](#) 2 Data Elements is to allow a zero length to be conveyed when the operator or application does not know its value or has a specific reason for not specifying its value. It is the intent that the device should support these Data Elements.

#### Examples

[TraverseModules.cxx](#).

### 10.321.2 Member Enumeration Documentation

#### 10.321.2.1 TypeType

```
enum gdcm::Type::TypeType
```

#### Enumerator

T1	
T1C	
T2	
T2C	
T3	
UNKNOWN	

### 10.321.3 Constructor & Destructor Documentation

### 10.321.3.1 Type()

```
gdcM::Type::Type (
    TypeType type = UNKNOWN ) [inline]
```

## 10.321.4 Member Function Documentation

### 10.321.4.1 GetTypeString()

```
static const char * gdcM::Type::GetTypeString (
    TypeType type ) [static]
```

### 10.321.4.2 GetTypeType()

```
static TypeType gdcM::Type::GetTypeType (
    const char * type ) [static]
```

Referenced by [gdcM::ModuleEntry::ModuleEntry\(\)](#).

### 10.321.4.3 operator TypeType()

```
gdcM::Type::operator TypeType ( ) const [inline]
```

## 10.321.5 Friends And Related Function Documentation

### 10.321.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Type & vr ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMType.h](#)

## 10.322 gdcm::UI Struct Reference

```
#include <gdcmVR.h>
```

### Public Attributes

- char [Internal](#) [64+1]

### Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [UI](#) &\_val)

### 10.322.1 Friends And Related Function Documentation

#### 10.322.1.1 operator<<

```
std::ostream & operator<< (  
    std::ostream & _os,  
    const UI & _val ) [friend]
```

### 10.322.2 Member Data Documentation

#### 10.322.2.1 Internal

```
char gdcm::UI::Internal[64+1]
```

The documentation for this struct was generated from the following file:

- [gdcmVR.h](#)

## 10.323 gdcm::UIDGenerator Class Reference

Class for generating unique UID.

```
#include <gdcmUIDGenerator.h>
```

## Public Member Functions

- [UIDGenerator](#) ()  
*By default the root of a UID is a GDCM Root...*
- const char \* [Generate](#) ()

## Static Public Member Functions

- static const char \* [GetGDCMUID](#) ()  
*Return the default (GDCM) root UID:*
- static const char \* [GetRoot](#) ()
- static bool [IsValid](#) (const char \*uid)
- static void [SetRoot](#) (const char \*root)

## Static Protected Member Functions

- static bool [GenerateUUID](#) (unsigned char \*uuid\_data)

### 10.323.1 Detailed Description

Class for generating unique UID.

#### Note

bla [Usage](#): When constructing a [Series](#) or [Study](#) UID, user *has* to keep around the UID, otherwise the UID Generator will simply forget the value and create a new UID.

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [ManipulateFile.cs](#), [MpegVideoInfo.cs](#), [ReformatFile.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and [uid\\_unique.cxx](#).

### 10.323.2 Constructor & Destructor Documentation

#### 10.323.2.1 UIDGenerator()

```
gdcmm::UIDGenerator::UIDGenerator ( ) [inline]
```

By default the root of a UID is a GDCM Root...



### 10.323.3 Member Function Documentation

#### 10.323.3.1 Generate()

```
const char * gdcm::UIDGenerator::Generate ( )
```

Internally uses a `std::string`, so two calls have the same pointer ! save into a `std::string` In summary do not write code like that: `const char *uid1 = uid.Generate(); const char *uid2 = uid.Generate();` since `uid1 == uid2`

##### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GetSubSequenceData.cxx](#), [ManipulateFile.cs](#), [ReformatFile.cs](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), and [uid\\_unique.cxx](#).

#### 10.323.3.2 GenerateUUID()

```
static bool gdcm::UIDGenerator::GenerateUUID (
    unsigned char * uuid_data ) [static], [protected]
```

#### 10.323.3.3 GetGDCMUID()

```
static const char * gdcm::UIDGenerator::GetGDCMUID ( ) [static]
```

Return the default (GDCM) root UID:

#### 10.323.3.4 GetRoot()

```
static const char * gdcm::UIDGenerator::GetRoot ( ) [static]
```

##### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [ReformatFile.cs](#), and [StandardizeFiles.cs](#).

### 10.323.3.5 IsValid()

```
static bool gdcM::UIDGenerator::IsValid (
    const char * uid ) [static]
```

Find out if the string is a valid UID or not

**Todo** : Move that in DataStructureAndEncoding (see FileMetaInformation::CheckFileMetaInformation)

### 10.323.3.6 SetRoot()

```
static void gdcM::UIDGenerator::SetRoot (
    const char * root ) [static]
```

The current implementation in GDCM make use of the UUID implementation (RFC 4122) and has been successfully been tested for a root of size 26 bytes. Any longer root should work (the [Generate\(\)](#) function will return a string), but will truncate the high bits of the 128bits UUID until the generated string fits on 64 bits. The authors disclaims any responsability for guaranteeing uniqueness of [UIDs](#) when the root is longer than 26 bytes.

#### Examples

[ClinicalTrialIdentificationWorkflow.cs](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), and [uid\\_unique.cxx](#).

The documentation for this class was generated from the following file:

- [gdcMUIDGenerator.h](#)

## 10.324 gdcM::UIDs Class Reference

all known uids

```
#include <gdcMUIDs.h>
```

## Public Types

- typedef const char \*const (\* [TransferSyntaxStringsType](#))[2]
- enum [TSName](#) {
  - [VerificationSOPClass](#) = 1 ,
  - [ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM](#) = 2 ,
  - [ExplicitVRLittleEndian](#) = 3 ,
  - [DeflatedExplicitVRLittleEndian](#) = 4 ,
  - [ExplicitVRBigEndian](#) = 5 ,
  - [JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression](#) = 6 ,
  - [JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only](#) = 7 ,
  - [JPEGExtendedProcess35Retired](#) = 8 ,
  - [JPEGSpectralSelectionNonHierarchicalProcess68Retired](#) = 9 ,
  - [JPEGSpectralSelectionNonHierarchicalProcess79Retired](#) = 10 ,
  - [JPEGFullProgressionNonHierarchicalProcess1012Retired](#) = 11 ,
  - [JPEGFullProgressionNonHierarchicalProcess1113Retired](#) = 12 ,
  - [JPEGLosslessNonHierarchicalProcess14](#) = 13 ,
  - [JPEGLosslessNonHierarchicalProcess15Retired](#) = 14 ,
  - [JPEGExtendedHierarchicalProcess1618Retired](#) = 15 ,
  - [JPEGExtendedHierarchicalProcess1719Retired](#) = 16 ,
  - [JPEGSpectralSelectionHierarchicalProcess2022Retired](#) = 17 ,
  - [JPEGSpectralSelectionHierarchicalProcess2123Retired](#) = 18 ,
  - [JPEGFullProgressionHierarchicalProcess2426Retired](#) = 19 ,
  - [JPEGFullProgressionHierarchicalProcess2527Retired](#) = 20 ,
  - [JPEGLosslessHierarchicalProcess28Retired](#) = 21 ,
  - [JPEGLosslessHierarchicalProcess29Retired](#) = 22 ,
  - [JPEGLosslessNonHierarchicalFirstOrderPredictionProcess14SelectionValue1DefaultTransferSyntaxforLosslessJPEGImageCompression](#) = 23 ,
  - [JPEGLSLosslessImageCompression](#) = 24 ,
  - [JPEGLSLossyNearLosslessImageCompression](#) = 25 ,
  - [JPEG2000ImageCompressionLosslessOnly](#) = 26 ,
  - [JPEG2000ImageCompression](#) = 27 ,
  - [JPEG2000Part2MulticomponentImageCompressionLosslessOnly](#) = 28 ,
  - [JPEG2000Part2MulticomponentImageCompression](#) = 29 ,
  - [JPIPReferenced](#) = 30 ,
  - [JPIPReferencedDeflate](#) = 31 ,
  - [MPEG2MainProfileMainLevel](#) = 32 ,
  - [RLELossless](#) = 33 ,
  - [RFC2557MIMEencapsulation](#) = 34 ,
  - [XMLEncoding](#) = 35 ,
  - [MediaStorageDirectoryStorage](#) = 36 ,
  - [TalairachBrainAtlasFrameofReference](#) = 37 ,
  - [SPM2T1FrameofReference](#) = 38 ,
  - [SPM2T2FrameofReference](#) = 39 ,
  - [SPM2PDFFrameofReference](#) = 40 ,
  - [SPM2EPIFrameofReference](#) = 41 ,
  - [SPM2FILT1FrameofReference](#) = 42 ,
  - [SPM2PETFrameofReference](#) = 43 ,
  - [SPM2TRANSMFrameofReference](#) = 44 ,
  - [SPM2SPECTFrameofReference](#) = 45 ,
  - [SPM2GRAYFrameofReference](#) = 46 ,
  - [SPM2WHITEFrameofReference](#) = 47 ,
  - [SPM2CSFFrameofReference](#) = 48 ,
  - [SPM2BRAINMASKFrameofReference](#) = 49 ,

[SPM2AVG305T1FrameofReference](#) = 50 ,  
[SPM2AVG152T1FrameofReference](#) = 51 ,  
[SPM2AVG152T2FrameofReference](#) = 52 ,  
[SPM2AVG152PDFrameofReference](#) = 53 ,  
[SPM2SINGLESUBJT1FrameofReference](#) = 54 ,  
[ICBM452T1FrameofReference](#) = 55 ,  
[ICBMSingleSubjectMRIFrameofReference](#) = 56 ,  
[BasicStudyContentNotificationSOPClassRetired](#) = 57 ,  
[StorageCommitmentPushModelSOPClass](#) = 58 ,  
[StorageCommitmentPushModelSOPInstance](#) = 59 ,  
[StorageCommitmentPullModelSOPClassRetired](#) = 60 ,  
[StorageCommitmentPullModelSOPInstanceRetired](#) = 61 ,  
[ProceduralEventLoggingSOPClass](#) = 62 ,  
[ProceduralEventLoggingSOPInstance](#) = 63 ,  
[SubstanceAdministrationLoggingSOPClass](#) = 64 ,  
[SubstanceAdministrationLoggingSOPInstance](#) = 65 ,  
[DICOMUIDRegistry](#) = 66 ,  
[DICOMControlledTerminology](#) = 67 ,  
[DICOMApplicationContextName](#) = 68 ,  
[DetachedPatientManagementSOPClassRetired](#) = 69 ,  
[DetachedPatientManagementMetaSOPClassRetired](#) = 70 ,  
[DetachedVisitManagementSOPClassRetired](#) = 71 ,  
[DetachedStudyManagementSOPClassRetired](#) = 72 ,  
[StudyComponentManagementSOPClassRetired](#) = 73 ,  
[ModalityPerformedProcedureStepSOPClass](#) = 74 ,  
[ModalityPerformedProcedureStepRetrieveSOPClass](#) = 75 ,  
[ModalityPerformedProcedureStepNotificationSOPClass](#) = 76 ,  
[DetachedResultsManagementSOPClassRetired](#) = 77 ,  
[DetachedResultsManagementMetaSOPClassRetired](#) = 78 ,  
[DetachedStudyManagementMetaSOPClassRetired](#) = 79 ,  
[DetachedInterpretationManagementSOPClassRetired](#) = 80 ,  
[StorageServiceClass](#) = 81 ,  
[BasicFilmSessionSOPClass](#) = 82 ,  
[BasicFilmBoxSOPClass](#) = 83 ,  
[BasicGrayscaleImageBoxSOPClass](#) = 84 ,  
[BasicColorImageBoxSOPClass](#) = 85 ,  
[ReferencedImageBoxSOPClassRetired](#) = 86 ,  
[BasicGrayscalePrintManagementMetaSOPClass](#) = 87 ,  
[ReferencedGrayscalePrintManagementMetaSOPClassRetired](#) = 88 ,  
[PrintJobSOPClass](#) = 89 ,  
[BasicAnnotationBoxSOPClass](#) = 90 ,  
[PrinterSOPClass](#) = 91 ,  
[PrinterConfigurationRetrievalSOPClass](#) = 92 ,  
[PrinterSOPInstance](#) = 93 ,  
[PrinterConfigurationRetrievalSOPInstance](#) = 94 ,  
[BasicColorPrintManagementMetaSOPClass](#) = 95 ,  
[ReferencedColorPrintManagementMetaSOPClassRetired](#) = 96 ,  
[VOILUTBoxSOPClass](#) = 97 ,  
[PresentationLUTSOPClass](#) = 98 ,  
[ImageOverlayBoxSOPClassRetired](#) = 99 ,  
[BasicPrintImageOverlayBoxSOPClassRetired](#) = 100 ,  
[PrintQueueSOPInstanceRetired](#) = 101 ,  
[PrintQueueManagementSOPClassRetired](#) = 102 ,  
[StoredPrintStorageSOPClassRetired](#) = 103 ,

HardcopyGrayscaleImageStorageSOPClassRetired = 104 ,  
HardcopyColorImageStorageSOPClassRetired = 105 ,  
PullPrintRequestSOPClassRetired = 106 ,  
PullStoredPrintManagementMetaSOPClassRetired = 107 ,  
MediaCreationManagementSOPClassUID = 108 ,  
ComputedRadiographyImageStorage = 109 ,  
DigitalXRayImageStorageForPresentation = 110 ,  
DigitalXRayImageStorageForProcessing = 111 ,  
DigitalMammographyXRayImageStorageForPresentation = 112 ,  
DigitalMammographyXRayImageStorageForProcessing = 113 ,  
DigitalIntraoralXRayImageStorageForPresentation = 114 ,  
DigitalIntraoralXRayImageStorageForProcessing = 115 ,  
CTImageStorage = 116 ,  
EnhancedCTImageStorage = 117 ,  
UltrasoundMultiframeImageStorageRetired = 118 ,  
UltrasoundMultiframeImageStorage = 119 ,  
MRIImageStorage = 120 ,  
EnhancedMRIImageStorage = 121 ,  
MRSpectroscopyStorage = 122 ,  
NuclearMedicineImageStorageRetired = 123 ,  
UltrasoundImageStorageRetired = 124 ,  
UltrasoundImageStorage = 125 ,  
SecondaryCaptureImageStorage = 126 ,  
MultiframeSingleBitSecondaryCaptureImageStorage = 127 ,  
MultiframeGrayscaleByteSecondaryCaptureImageStorage = 128 ,  
MultiframeGrayscaleWordSecondaryCaptureImageStorage = 129 ,  
MultiframeTrueColorSecondaryCaptureImageStorage = 130 ,  
StandaloneOverlayStorageRetired = 131 ,  
StandaloneCurveStorageRetired = 132 ,  
WaveformStorageTrialRetired = 133 ,  
ECG12leadWaveformStorage = 134 ,  
GeneralECGWaveformStorage = 135 ,  
AmbulatoryECGWaveformStorage = 136 ,  
HemodynamicWaveformStorage = 137 ,  
CardiacElectrophysiologyWaveformStorage = 138 ,  
BasicVoiceAudioWaveformStorage = 139 ,  
StandaloneModalityLUTStorageRetired = 140 ,  
StandaloneVOILUTStorageRetired = 141 ,  
GrayscaleSoftcopyPresentationStateStorageSOPClass = 142 ,  
ColorSoftcopyPresentationStateStorageSOPClass = 143 ,  
PseudoColorSoftcopyPresentationStateStorageSOPClass = 144 ,  
BlendingSoftcopyPresentationStateStorageSOPClass = 145 ,  
XRayAngiographicImageStorage = 146 ,  
EnhancedXAImageStorage = 147 ,  
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uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_66\_4 = 158 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_67 = 159 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1 = 160 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_2 = 161 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_1 = 162 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_1\_1 = 163 ,  
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uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_4\_1 = 168 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_5\_1 = 169 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_5\_2 = 170 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_5\_3 = 171 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_77\_1\_5\_4 = 172 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_1 = 173 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_2 = 174 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_3 = 175 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_4 = 176 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_11 = 177 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_22 = 178 ,  
uid\_1\_2\_840\_10008\_5\_1\_4\_1\_1\_88\_33 = 179 ,

```
uid_1_2_840_10008_5_1_4_1_1_88_40 = 180 ,  
uid_1_2_840_10008_5_1_4_1_1_88_50 = 181 ,  
uid_1_2_840_10008_5_1_4_1_1_88_59 = 182 ,  
uid_1_2_840_10008_5_1_4_1_1_88_65 = 183 ,  
uid_1_2_840_10008_5_1_4_1_1_88_67 = 184 ,  
uid_1_2_840_10008_5_1_4_1_1_104_1 = 185 ,  
uid_1_2_840_10008_5_1_4_1_1_104_2 = 186 ,  
uid_1_2_840_10008_5_1_4_1_1_128 = 187 ,  
uid_1_2_840_10008_5_1_4_1_1_129 = 188 ,  
uid_1_2_840_10008_5_1_4_1_1_481_1 = 189 ,  
uid_1_2_840_10008_5_1_4_1_1_481_2 = 190 ,  
uid_1_2_840_10008_5_1_4_1_1_481_3 = 191 ,  
uid_1_2_840_10008_5_1_4_1_1_481_4 = 192 ,  
uid_1_2_840_10008_5_1_4_1_1_481_5 = 193 ,  
uid_1_2_840_10008_5_1_4_1_1_481_6 = 194 ,  
uid_1_2_840_10008_5_1_4_1_1_481_7 = 195 ,  
uid_1_2_840_10008_5_1_4_1_1_481_8 = 196 ,  
uid_1_2_840_10008_5_1_4_1_1_481_9 = 197 ,  
uid_1_2_840_10008_5_1_4_1_2_1_1 = 198 ,  
uid_1_2_840_10008_5_1_4_1_2_1_2 = 199 ,  
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uid_1_2_840_10008_5_1_4_1_2_2_3 = 203 ,  
uid_1_2_840_10008_5_1_4_1_2_3_1 = 204 ,  
uid_1_2_840_10008_5_1_4_1_2_3_2 = 205 ,  
uid_1_2_840_10008_5_1_4_1_2_3_3 = 206 ,  
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uid_1_2_840_10008_5_1_4_32_2 = 209 ,  
uid_1_2_840_10008_5_1_4_32_3 = 210 ,  
uid_1_2_840_10008_5_1_4_32 = 211 ,  
uid_1_2_840_10008_5_1_4_33 = 212 ,  
uid_1_2_840_10008_5_1_4_34_1 = 213 ,  
uid_1_2_840_10008_5_1_4_34_2 = 214 ,  
uid_1_2_840_10008_5_1_4_34_3 = 215 ,  
uid_1_2_840_10008_5_1_4_34_4 = 216 ,  
uid_1_2_840_10008_5_1_4_34_4_1 = 217 ,  
uid_1_2_840_10008_5_1_4_34_4_2 = 218 ,  
uid_1_2_840_10008_5_1_4_34_4_3 = 219 ,  
uid_1_2_840_10008_5_1_4_34_4_4 = 220 ,  
uid_1_2_840_10008_5_1_4_34_5 = 221 ,  
uid_1_2_840_10008_5_1_4_37_1 = 222 ,  
uid_1_2_840_10008_5_1_4_37_2 = 223 ,  
uid_1_2_840_10008_5_1_4_37_3 = 224 ,  
uid_1_2_840_10008_5_1_4_38_1 = 225 ,  
uid_1_2_840_10008_5_1_4_38_2 = 226 ,  
uid_1_2_840_10008_5_1_4_38_3 = 227 ,  
uid_1_2_840_10008_5_1_4_41 = 228 ,  
uid_1_2_840_10008_5_1_4_42 = 229 ,  
uid_1_2_840_10008_15_0_3_1 = 230 ,  
uid_1_2_840_10008_15_0_3_2 = 231 ,  
uid_1_2_840_10008_15_0_3_3 = 232 ,  
uid_1_2_840_10008_15_0_3_4 = 233 ,
```

```
uid_1_2_840_10008_15_0_3_5 = 234 ,
uid_1_2_840_10008_15_0_3_6 = 235 ,
uid_1_2_840_10008_15_0_3_7 = 236 ,
uid_1_2_840_10008_15_0_3_8 = 237 ,
uid_1_2_840_10008_15_0_3_9 = 238 ,
uid_1_2_840_10008_15_0_3_10 = 239 ,
uid_1_2_840_10008_15_0_3_11 = 240 ,
uid_1_2_840_10008_15_0_3_12 = 241 ,
uid_1_2_840_10008_15_0_3_13 = 242 ,
uid_1_2_840_10008_15_0_3_14 = 243 ,
uid_1_2_840_10008_15_0_3_15 = 244 ,
uid_1_2_840_10008_15_0_3_16 = 245 ,
uid_1_2_840_10008_15_0_3_17 = 246 ,
uid_1_2_840_10008_15_0_3_18 = 247 ,
uid_1_2_840_10008_15_0_3_19 = 248 ,
uid_1_2_840_10008_15_0_3_20 = 249 ,
uid_1_2_840_10008_15_0_3_21 = 250 ,
uid_1_2_840_10008_15_0_3_22 = 251 ,
uid_1_2_840_10008_15_0_3_23 = 252 ,
uid_1_2_840_10008_15_0_3_24 = 253 ,
uid_1_2_840_10008_15_0_3_25 = 254 ,
uid_1_2_840_10008_15_0_3_26 = 255 ,
uid_1_2_840_10008_15_0_3_27 = 256 ,
uid_1_2_840_10008_15_0_3_28 = 257 ,
uid_1_2_840_10008_15_0_3_29 = 258 ,
uid_1_2_840_10008_15_0_3_30 = 259 ,
uid_1_2_840_10008_15_0_3_31 = 260 ,
uid_1_2_840_10008_15_0_4_1 = 261 ,
uid_1_2_840_10008_15_0_4_2 = 262 ,
uid_1_2_840_10008_15_0_4_3 = 263 ,
uid_1_2_840_10008_15_0_4_4 = 264 ,
uid_1_2_840_10008_15_0_4_5 = 265 ,
uid_1_2_840_10008_15_0_4_6 = 266 ,
uid_1_2_840_10008_15_0_4_7 = 267 ,
uid_1_2_840_10008_15_0_4_8 = 268 ,
uid_1_2_840_10008_5_1_4_1_1_77_1_6 = 269 ,
uid_1_2_840_10008_5_1_4_1_1_6_2 = 270 ,
uid_1_2_840_10008_5_1_4_1_1_66_5 = 271 ,
uid_1_2_840_10008_5_1_4_1_1_13_1_3 = 272 ,
uid_1_2_840_10008_5_1_4_1_1_2_2 = 273 ,
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uid_1_2_840_10008_5_1_4_1_1_128_1 = 275 ,
uid_1_2_840_10008_1_2_4_101 = 276 ,
uid_1_2_840_10008_1_2_4_102 = 277 ,
uid_1_2_840_10008_1_2_4_103 = 278 ,
uid_1_2_840_10008_1_5_2 = 279 ,
uid_1_2_840_10008_1_5_3 = 280 ,
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uid_1_2_840_10008_1_5_7 = 284 ,
uid_1_2_840_10008_1_5_8 = 285 ,
uid_1_2_840_10008_1_20 = 286 ,
uid_1_2_840_10008_2_16_5 = 287 ,
```

```
uid_1_2_840_10008_2_16_6 = 288 ,
uid_1_2_840_10008_2_16_7 = 289 ,
uid_1_2_840_10008_2_16_8 = 290 ,
uid_1_2_840_10008_2_16_9 = 291 ,
uid_1_2_840_10008_2_16_10 = 292 ,
uid_1_2_840_10008_2_16_11 = 293 ,
uid_1_2_840_10008_2_16_12 = 294 ,
uid_1_2_840_10008_2_16_13 = 295 ,
uid_1_2_840_10008_2_16_14 = 296 ,
uid_1_2_840_10008_5_1_1_40 = 297 ,
uid_1_2_840_10008_5_1_1_40_1 = 298 ,
uid_1_2_840_10008_5_1_4_1_1_9_4_2 = 299 ,
uid_1_2_840_10008_5_1_4_1_1_9_5_1 = 300 ,
uid_1_2_840_10008_5_1_4_1_1_9_6_1 = 301 ,
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uid_1_2_840_10008_5_1_4_1_1_11_6 = 303 ,
uid_1_2_840_10008_1_2_4_104 = 304 ,
uid_1_2_840_10008_1_2_4_105 = 305 ,
uid_1_2_840_10008_1_2_4_106 = 306 ,
uid_1_2_840_10008_1_2_4_107 = 307 ,
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uid_1_2_840_10008_1_5_1 = 309 ,
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uid_1_2_840_10008_5_1_4_1_1_11_8 = 311 ,
uid_1_2_840_10008_5_1_4_1_1_11_9 = 312 ,
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uid_1_2_840_10008_5_1_4_1_1_11_11 = 314 ,
uid_1_2_840_10008_5_1_4_1_1_12_77 = 315 ,
uid_1_2_840_10008_5_1_4_1_1_13_1_4 = 316 ,
uid_1_2_840_10008_5_1_4_1_1_13_1_5 = 317 ,
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uid_1_2_840_10008_5_1_4_1_1_14_2 = 319 ,
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uid_1_2_840_10008_5_1_4_1_1_77_1_5_7 = 327 ,
uid_1_2_840_10008_5_1_4_1_1_77_1_5_8 = 328 ,
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uid_1_2_840_10008_5_1_4_1_1_78_3 = 331 ,
uid_1_2_840_10008_5_1_4_1_1_78_4 = 332 ,
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uid_1_2_840_10008_5_1_4_1_1_78_6 = 334 ,
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uid_1_2_840_10008_5_1_4_1_1_78_8 = 336 ,
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uid_1_2_840_10008_5_1_4_1_1_81_1 = 339 ,
uid_1_2_840_10008_5_1_4_1_1_82_1 = 340 ,
uid_1_2_840_10008_5_1_4_1_1_88_34 = 341 ,
```



```
uid_1_2_840_10008_5_1_4_1_1_88_35 = 342 ,  
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uid_1_2_840_10008_5_1_4_1_1_88_70 = 345 ,  
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uid_1_2_840_10008_5_1_4_1_1_88_73 = 348 ,  
uid_1_2_840_10008_5_1_4_1_1_88_74 = 349 ,  
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uid_1_2_840_10008_5_1_4_1_1_200_6 = 360 ,  
uid_1_2_840_10008_5_1_4_1_1_481_10 = 361 ,  
uid_1_2_840_10008_5_1_4_1_1_481_11 = 362 ,  
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uid_1_2_840_10008_5_1_4_1_1_501_2_1 = 364 ,  
uid_1_2_840_10008_5_1_4_1_1_501_2_2 = 365 ,  
uid_1_2_840_10008_5_1_4_1_1_501_3 = 366 ,  
uid_1_2_840_10008_5_1_4_1_1_501_4 = 367 ,  
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uid_1_2_840_10008_5_1_4_1_1_601_2 = 371 ,  
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uid_1_2_840_10008_5_1_4_34_6 = 379 ,  
uid_1_2_840_10008_5_1_4_34_6_1 = 380 ,  
uid_1_2_840_10008_5_1_4_34_6_2 = 381 ,  
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uid_1_2_840_10008_5_1_4_34_8 = 385 ,  
uid_1_2_840_10008_5_1_4_34_9 = 386 ,  
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uid_1_2_840_10008_5_1_4_38_4 = 388 ,  
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uid_1_2_840_10008_5_1_4_39_2 = 390 ,  
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uid_1_2_840_10008_5_1_4_39_4 = 392 ,  
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uid_1_2_840_10008_5_1_4_43_2 = 394 ,  
uid_1_2_840_10008_5_1_4_43_3 = 395 ,
```

```

uid_1_2_840_10008_5_1_4_43_4 = 396 ,
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uid_1_2_840_10008_5_1_4_44_2 = 398 ,
uid_1_2_840_10008_5_1_4_44_3 = 399 ,
uid_1_2_840_10008_5_1_4_44_4 = 400 ,
uid_1_2_840_10008_5_1_4_45_1 = 401 ,
uid_1_2_840_10008_5_1_4_45_2 = 402 ,
uid_1_2_840_10008_5_1_4_45_3 = 403 ,
uid_1_2_840_10008_5_1_4_45_4 = 404 ,
uid_1_2_840_10008_7_1_1 = 405 ,
uid_1_2_840_10008_7_1_2 = 406 ,
uid_1_2_840_10008_8_1_1 = 407 ,
uid_1_2_840_10008_5_1_4_1_1_4_3 = 408 ,
uid_1_2_840_10008_15_1_1 = 409 }

```

## Public Member Functions

- const char \* [GetName](#) () const
- const char \* [GetString](#) () const
- [operator TSType](#) () const
- bool [SetFromUID](#) (const char \*str)

## Static Public Member Functions

- static unsigned int [GetNumberOfTransferSyntaxStrings](#) ()
- static const char \*const \* [GetTransferSyntaxString](#) (unsigned int ts)
- static [TransferSyntaxStringsType](#) [GetTransferSyntaxStrings](#) ()
- static const char \* [GetUIDName](#) (unsigned int ts)
- static const char \* [GetUIDString](#) (unsigned int ts)

### 10.324.1 Detailed Description

all known uids

Examples

[GenerateStandardSOPClasses.cxx](#).

### 10.324.2 Member Typedef Documentation

#### 10.324.2.1 TransferSyntaxStringsType

```
typedef const char* const (* gdcmm::UIDs::TransferSyntaxStringsType) [2]
```

### 10.324.3 Member Enumeration Documentation

#### 10.324.3.1 TSName

enum `gdcm::UIDs::TSName`

##### Enumerator

VerificationSOPClass	
ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM	
ExplicitVRLittleEndian	
DeflatedExplicitVRLittleEndian	
ExplicitVRBigEndian	
JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression	
JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only	
JPEGExtendedProcess35Retired	
JPEGSpectralSelectionNonHierarchicalProcess68Retired	
JPEGSpectralSelectionNonHierarchicalProcess79Retired	
JPEGFullProgressionNonHierarchicalProcess1012Retired	
JPEGFullProgressionNonHierarchicalProcess1113Retired	
JPEGLosslessNonHierarchicalProcess14	
JPEGLosslessNonHierarchicalProcess15Retired	
JPEGExtendedHierarchicalProcess1618Retired	
JPEGExtendedHierarchicalProcess1719Retired	
JPEGSpectralSelectionHierarchicalProcess2022Retired	
JPEGSpectralSelectionHierarchicalProcess2123Retired	
JPEGFullProgressionHierarchicalProcess2426Retired	
JPEGFullProgressionHierarchicalProcess2527Retired	
JPEGLosslessHierarchicalProcess28Retired	
JPEGLosslessHierarchicalProcess29Retired	
JPEGLosslessNonHierarchicalFirstOrderPredictionProcess14SelectionValue1DefaultTransferSyntaxforLossless↔ JPEGImageCompression	
JPEGLSLosslessImageCompression	
JPEGLSLossyNearLosslessImageCompression	
JPEG2000ImageCompressionLosslessOnly	
JPEG2000ImageCompression	
JPEG2000Part2MulticomponentImageCompressionLosslessOnly	
JPEG2000Part2MulticomponentImageCompression	
JPIPReferenced	
JPIPReferencedDeflate	
MPEG2MainProfileMainLevel	
RLELossless	
RFC2557MIMEencapsulation	
XMLEncoding	

## Enumerator

MediaStorageDirectoryStorage
TalairachBrainAtlasFrameofReference
SPM2T1FrameofReference
SPM2T2FrameofReference
SPM2PDFFrameofReference
SPM2EPIFrameofReference
SPM2FILT1FrameofReference
SPM2PETFrameofReference
SPM2TRANSMFrameofReference
SPM2SPECTFrameofReference
SPM2GRAYFrameofReference
SPM2WHITEFrameofReference
SPM2CSFFrameofReference
SPM2BRAINMASKFrameofReference
SPM2AVG305T1FrameofReference
SPM2AVG152T1FrameofReference
SPM2AVG152T2FrameofReference
SPM2AVG152PDFFrameofReference
SPM2SINGLESUBJT1FrameofReference
ICBM452T1FrameofReference
ICBMSingleSubjectMRIFrameofReference
BasicStudyContentNotificationSOPClassRetired
StorageCommitmentPushModelSOPClass
StorageCommitmentPushModelSOPInstance
StorageCommitmentPullModelSOPClassRetired
StorageCommitmentPullModelSOPInstanceRetired
ProceduralEventLoggingSOPClass
ProceduralEventLoggingSOPInstance
SubstanceAdministrationLoggingSOPClass
SubstanceAdministrationLoggingSOPInstance
DICOMUIDRegistry
DICOMControlledTerminology
DICOMApplicationContextName
DetachedPatientManagementSOPClassRetired
DetachedPatientManagementMetaSOPClassRetired
DetachedVisitManagementSOPClassRetired
DetachedStudyManagementSOPClassRetired
StudyComponentManagementSOPClassRetired
ModalityPerformedProcedureStepSOPClass
ModalityPerformedProcedureStepRetrieveSOPClass
ModalityPerformedProcedureStepNotificationSOPClass
DetachedResultsManagementSOPClassRetired
DetachedResultsManagementMetaSOPClassRetired
DetachedStudyManagementMetaSOPClassRetired

## Enumerator

DetachedInterpretationManagementSOPClassRetired	
StorageServiceClass	
BasicFilmSessionSOPClass	
BasicFilmBoxSOPClass	
BasicGrayscaleImageBoxSOPClass	
BasicColorImageBoxSOPClass	
ReferencedImageBoxSOPClassRetired	
BasicGrayscalePrintManagementMetaSOPClass	
ReferencedGrayscalePrintManagementMetaSOPClassRetired	
PrintJobSOPClass	
BasicAnnotationBoxSOPClass	
PrinterSOPClass	
PrinterConfigurationRetrievalSOPClass	
PrinterSOPInstance	
PrinterConfigurationRetrievalSOPInstance	
BasicColorPrintManagementMetaSOPClass	
ReferencedColorPrintManagementMetaSOPClassRetired	
VOILUTBoxSOPClass	
PresentationLUTSOPClass	
ImageOverlayBoxSOPClassRetired	
BasicPrintImageOverlayBoxSOPClassRetired	
PrintQueueSOPInstanceRetired	
PrintQueueManagementSOPClassRetired	
StoredPrintStorageSOPClassRetired	
HardcopyGrayscaleImageStorageSOPClassRetired	
HardcopyColorImageStorageSOPClassRetired	
PullPrintRequestSOPClassRetired	
PullStoredPrintManagementMetaSOPClassRetired	
MediaCreationManagementSOPClassUID	
ComputedRadiographyImageStorage	
DigitalXRayImageStorageForPresentation	
DigitalXRayImageStorageForProcessing	
DigitalMammographyXRayImageStorageForPresentation	
DigitalMammographyXRayImageStorageForProcessing	
DigitalIntraoralXRayImageStorageForPresentation	
DigitalIntraoralXRayImageStorageForProcessing	
CTImageStorage	
EnhancedCTImageStorage	
UltrasoundMultiframeImageStorageRetired	
UltrasoundMultiframeImageStorage	
MRImageStorage	
EnhancedMRImageStorage	
MRSpectroscopyStorage	

## Enumerator

NuclearMedicineImageStorageRetired	
UltrasoundImageStorageRetired	
UltrasoundImageStorage	
SecondaryCaptureImageStorage	
MultiframeSingleBitSecondaryCaptureImageStorage	
MultiframeGrayscaleByteSecondaryCaptureImageStorage	
MultiframeGrayscaleWordSecondaryCaptureImageStorage	
MultiframeTrueColorSecondaryCaptureImageStorage	
StandaloneOverlayStorageRetired	
StandaloneCurveStorageRetired	
WaveformStorageTrialRetired	
ECG12leadWaveformStorage	
GeneralECGWaveformStorage	
AmbulatoryECGWaveformStorage	
HemodynamicWaveformStorage	
CardiacElectrophysiologyWaveformStorage	
BasicVoiceAudioWaveformStorage	
StandaloneModalityLUTStorageRetired	
StandaloneVOILUTStorageRetired	
GrayscaleSoftcopyPresentationStateStorageSOPClass	
ColorSoftcopyPresentationStateStorageSOPClass	
PseudoColorSoftcopyPresentationStateStorageSOPClass	
BlendingSoftcopyPresentationStateStorageSOPClass	
XRayAngiographicImageStorage	
EnhancedXAImageStorage	
XRayRadiofluoroscopicImageStorage	
EnhancedXRFImageStorage	
XRay3DAngiographicImageStorage	
XRay3DCraniofacialImageStorage	
XRayAngiographicBiPlaneImageStorageRetired	
NuclearMedicineImageStorage	
RawDataStorage	
SpatialRegistrationStorage	
SpatialFiducialsStorage	
DeformableSpatialRegistrationStorage	
SegmentationStorage	
RealWorldValueMappingStorage	
VLImageStorageTrialRetired	
VLMultiframeImageStorageTrialRetired	
VLEndoscopicImageStorage	
VideoEndoscopicImageStorage	
VLMicroscopicImageStorage	
VideoMicroscopicImageStorage	

## Enumerator

VLSlideCoordinatesMicroscopicImageStorage	
VLPhotographicImageStorage	
VideoPhotographicImageStorage	
OphthalmicPhotography8BitImageStorage	
OphthalmicPhotography16BitImageStorage	
StereometricRelationshipStorage	
OphthalmicTomographyImageStorage	
TextSRStorageTrialRetired	
AudioSRStorageTrialRetired	
DetailSRStorageTrialRetired	
ComprehensiveSRStorageTrialRetired	
BasicTextSRStorage	
EnhancedSRStorage	
ComprehensiveSRStorage	
ProcedureLogStorage	
MammographyCADSRStorage	
KeyObjectSelectionDocumentStorage	
ChestCADSRStorage	
XRyRadiationDoseSRStorage	
EncapsulatedPDFStorage	
EncapsulatedCDASStorage	
PositronEmissionTomographyImageStorage	
StandalonePETCurveStorageRetired	
RTImageStorage	
RTDoseStorage	
RTStructureSetStorage	
RTBeamsTreatmentRecordStorage	
RTPlanStorage	
RTBrachyTreatmentRecordStorage	
RTTreatmentSummaryRecordStorage	
RTIonPlanStorage	
RTIonBeamsTreatmentRecordStorage	
PatientRootQueryRetrieveInformationModelFIND	
PatientRootQueryRetrieveInformationModelMOVE	
PatientRootQueryRetrieveInformationModelGET	
StudyRootQueryRetrieveInformationModelFIND	
StudyRootQueryRetrieveInformationModelMOVE	
StudyRootQueryRetrieveInformationModelGET	
PatientStudyOnlyQueryRetrieveInformationModelFINDRetired	
PatientStudyOnlyQueryRetrieveInformationModelMOVERetired	
PatientStudyOnlyQueryRetrieveInformationModelGETRetired	
ModalityWorklistInformationModelFIND	
GeneralPurposeWorklistInformationModelFIND	

## Enumerator

GeneralPurposeScheduledProcedureStepSOPClass	
GeneralPurposePerformedProcedureStepSOPClass	
GeneralPurposeWorklistManagementMetaSOPClass	
InstanceAvailabilityNotificationSOPClass	
RTBeamsDeliveryInstructionStorageSupplement74FrozenDraft	
RTConventionalMachineVerificationSupplement74FrozenDraft	
RTIonMachineVerificationSupplement74FrozenDraft	
UnifiedWorklistandProcedureStepServiceClass	
UnifiedProcedureStepPushSOPClass	
UnifiedProcedureStepWatchSOPClass	
UnifiedProcedureStepPullSOPClass	
UnifiedProcedureStepEventSOPClass	
UnifiedWorklistandProcedureStepSOPInstance	
GeneralRelevantPatientInformationQuery	
BreastImagingRelevantPatientInformationQuery	
CardiacRelevantPatientInformationQuery	
HangingProtocolStorage	
HangingProtocolInformationModelFIND	
HangingProtocolInformationModelMOVE	
ProductCharacteristicsQuerySOPClass	
SubstanceApprovalQuerySOPClass	
dicomDeviceName	
dicomDescription	
dicomManufacturer	
dicomManufacturerModelName	
dicomSoftwareVersion	
dicomVendorData	
dicomAETitle	
dicomNetworkConnectionReference	
dicomApplicationCluster	
dicomAssociationInitiator	
dicomAssociationAcceptor	
dicomHostname	
dicomPort	
dicomSOPClass	
dicomTransferRole	
dicomTransferSyntax	
dicomPrimaryDeviceType	
dicomRelatedDeviceReference	
dicomPreferredCalledAETitle	
dicomTLSCyphersuite	
dicomAuthorizedNodeCertificateReference	
dicomThisNodeCertificateReference	
dicomInstalled	



## Enumerator

dicomStationName
dicomDeviceSerialNumber
dicomInstitutionName
dicomInstitutionAddress
dicomInstitutionDepartmentName
dicomIssuerOfPatientID
dicomPreferredCallingAETitle
dicomSupportedCharacterSet
dicomConfigurationRoot
dicomDevicesRoot
dicomUniqueAETitlesRegistryRoot
dicomDevice
dicomNetworkAE
dicomNetworkConnection
dicomUniqueAETitle
dicomTransferCapability
VLWholeSlideMicroscopyImageStorage
EnhancedUSVolumeStorage
SurfaceSegmentationStorage
BreastTomosynthesisImageStorage
LegacyConvertedEnhancedCTImageStorage
LegacyConvertedEnhancedMRIImageStorage
LegacyConvertedEnhancedPETImageStorage
MPEG2MainProfileHighLevel
MPEG4AVCH_264HighProfileLevel4_1
MPEG4AVCH_264BDcompatibleHighProfileLevel4_1
PETColorPaletteSOPInstance
HotMetalBlueColorPaletteSOPInstance
PET20StepColorPaletteSOPInstance
SpringColorPaletteSOPInstance
SummerColorPaletteSOPInstance
FallColorPaletteSOPInstance
WinterColorPaletteSOPInstance
Papyrus3ImplicitVRLittleEndian
AdultMouseAnatomyOntology
UberonOntology
IntegratedTaxonomicInformationSystemITISTaxonomicSerialNumberTSN
MouseGenomeInitiativeMGI
PubChemCompoundCID
ICD11
NewYorkUniversityMelanomaClinicalCooperativeGroup
MayoClinicNonradiologicalImagesSBSAnatomicalSurfaceRegionGuide
ImageBiomarkerStandardisationInitiative
RadiomicsOntology

## Enumerator

DisplaySystemSOPClass	
DisplaySystemSOPInstance	
GeneralAudioWaveformStorage	
ArterialPulseWaveformStorage	
RespiratoryWaveformStorage	
XAXRFGrayscaleSoftcopyPresentationStateStorage	
GrayscalePlanarMPRVolumetricPresentationStateStorage	
MPEG4AVCH_264HighProfileLevel4_2For2DVideo	
MPEG4AVCH_264HighProfileLevel4_2For3DVideo	
MPEG4AVCH_264StereoHighProfileLevel4_2	
HEVCH_265MainProfileLevel5_1	
HEVCH_265Main10ProfileLevel5_1	
HotIronColorPaletteSOPInstance	
CompositingPlanarMPRVolumetricPresentationStateStorage	
AdvancedBlendingPresentationStateStorage	
VolumeRenderingVolumetricPresentationStateStorage	
SegmentedVolumeRenderingVolumetricPresentationStateStorage	
MultipleVolumeRenderingVolumetricPresentationStateStorage	
Null0	
BreastProjectionXRayImageStorageForPresentation	
BreastProjectionXRayImageStorageForProcessing	
IntravascularOpticalCoherenceTomographyImageStorageForPresentation	
IntravascularOpticalCoherenceTomographyImageStorageForProcessing	
ParametricMapStorage	
Null1	
TractographyResultsStorage	
SurfaceScanMeshStorage	
SurfaceScanPointCloudStorage	
WideFieldOphthalmicPhotographyStereographicProjectionImageStorage	
WideFieldOphthalmicPhotography3DCoordinatesImageStorage	
OphthalmicOpticalCoherenceTomographyEnFaceImageStorage	
OphthalmicOpticalCoherenceTomographyBscanVolumeAnalysisStorage	
LensometryMeasurementsStorage	
AutorefractionMeasurementsStorage	
KeratometryMeasurementsStorage	
SubjectiveRefractionMeasurementsStorage	
VisualAcuityMeasurementsStorage	
SpectaclePrescriptionReportStorage	
OphthalmicAxialMeasurementsStorage	
IntraocularLensCalculationsStorage	
MacularGridThicknessandVolumeReportStorage	
OphthalmicVisualFieldStaticPerimetryMeasurementsStorage	
OphthalmicThicknessMapStorage	

## Enumerator

CornealTopographyMapStorage	
Comprehensive3DSRStorage	
ExtensibleSRStorage	
RadiopharmaceuticalRadiationDoseSRStorage	
ColonCADSRStorage	
ImplantationPlanSRStorage	
AcquisitionContextSRStorage	
SimplifiedAdultEchoSRStorage	
PatientRadiationDoseSRStorage	
PlannedImagingAgentAdministrationSRStorage	
PerformedImagingAgentAdministrationSRStorage	
ContentAssessmentResultsStorage	
EncapsulatedSTLStorage	
EnhancedPETImageStorage	
BasicStructuredDisplayStorage	
CTDefinedProcedureProtocolStorage	
CTPerformedProcedureProtocolStorage	
ProtocolApprovalStorage	
ProtocolApprovalInformationModelFIND	
ProtocolApprovalInformationModelMOVE	
ProtocolApprovalInformationModelGET	
RTPhysicianIntentStorage	
RTSegmentAnnotationStorage	
DICOSCTImageStorage	
DICOSDigitalXRayImageStorageForPresentation	
DICOSDigitalXRayImageStorageForProcessing	
DICOSThreatDetectionReportStorage	
DICOS2DAITStorage	
DICOS3DAITStorage	
DICOSQuadrupoleResonanceQRStorage	
EddyCurrentImageStorage	
EddyCurrentMultiframeImageStorage	
CompositeInstanceRootRetrieveMOVE	
CompositeInstanceRootRetrieveGET	
CompositeInstanceRetrieveWithoutBulkDataGET	
DefinedProcedureProtocolInformationModelFIND	
DefinedProcedureProtocolInformationModelMOVE	
DefinedProcedureProtocolInformationModelGET	
UPSFilteredGlobalSubscriptionSOPInstance	
UnifiedWorklistandProcedureStepServiceClass1	
UnifiedProcedureStepPushSOPClass1	
UnifiedProcedureStepWatchSOPClass1	
UnifiedProcedureStepPullSOPClass1	

## Enumerator

UnifiedProcedureStepEventSOPClass1	
RTBeamsDeliveryInstructionStorage	
RTConventionalMachineVerification	
RTIonMachineVerification	
RTBrachyApplicationSetupDeliveryInstructionStorage	
HangingProtocolInformationModelGET	
ColorPaletteStorage	
ColorPaletteQueryRetrieveInformationModelFIND	
ColorPaletteQueryRetrieveInformationModelMOVE	
ColorPaletteQueryRetrieveInformationModelGET	
GenericImplantTemplateStorage	
GenericImplantTemplateInformationModelFIND	
GenericImplantTemplateInformationModelMOVE	
GenericImplantTemplateInformationModelGET	
ImplantAssemblyTemplateStorage	
ImplantAssemblyTemplateInformationModelFIND	
ImplantAssemblyTemplateInformationModelMOVE	
ImplantAssemblyTemplateInformationModelGET	
ImplantTemplateGroupStorage	
ImplantTemplateGroupInformationModelFIND	
ImplantTemplateGroupInformationModelMOVE	
ImplantTemplateGroupInformationModelGET	
NativeDICOMModel	
AbstractMultiDimensionalImageModel	
DICOMContentMappingResource	
EnhancedMRColorImageStorage	
UniversalCoordinatedTime	

## 10.324.3.2 TSType

```
enum gdcm::UIDs::TSType
```

## Enumerator

uid_1_2_840_10008_1_1	
uid_1_2_840_10008_1_2	
uid_1_2_840_10008_1_2_1	
uid_1_2_840_10008_1_2_1_99	
uid_1_2_840_10008_1_2_2	
uid_1_2_840_10008_1_2_4_50	
uid_1_2_840_10008_1_2_4_51	

## Enumerator

uid_1_2_840_10008_1_2_4_52	
uid_1_2_840_10008_1_2_4_53	
uid_1_2_840_10008_1_2_4_54	
uid_1_2_840_10008_1_2_4_55	
uid_1_2_840_10008_1_2_4_56	
uid_1_2_840_10008_1_2_4_57	
uid_1_2_840_10008_1_2_4_58	
uid_1_2_840_10008_1_2_4_59	
uid_1_2_840_10008_1_2_4_60	
uid_1_2_840_10008_1_2_4_61	
uid_1_2_840_10008_1_2_4_62	
uid_1_2_840_10008_1_2_4_63	
uid_1_2_840_10008_1_2_4_64	
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uid_1_2_840_10008_1_2_4_70	
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uid_1_2_840_10008_1_2_4_81	
uid_1_2_840_10008_1_2_4_90	
uid_1_2_840_10008_1_2_4_91	
uid_1_2_840_10008_1_2_4_92	
uid_1_2_840_10008_1_2_4_93	
uid_1_2_840_10008_1_2_4_94	
uid_1_2_840_10008_1_2_4_95	
uid_1_2_840_10008_1_2_4_100	
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uid_1_2_840_10008_1_2_6_1	
uid_1_2_840_10008_1_2_6_2	
uid_1_2_840_10008_1_3_10	
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uid_1_2_840_10008_1_4_1_13	
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uid_1_2_840_10008_1_4_1_15	
uid_1_2_840_10008_1_4_1_16	
uid_1_2_840_10008_1_4_1_17	

## Enumerator

uid_1_2_840_10008_1_4_1_18	
uid_1_2_840_10008_1_4_2_1	
uid_1_2_840_10008_1_4_2_2	
uid_1_2_840_10008_1_9	
uid_1_2_840_10008_1_20_1	
uid_1_2_840_10008_1_20_1_1	
uid_1_2_840_10008_1_20_2	
uid_1_2_840_10008_1_20_2_1	
uid_1_2_840_10008_1_40	
uid_1_2_840_10008_1_40_1	
uid_1_2_840_10008_1_42	
uid_1_2_840_10008_1_42_1	
uid_1_2_840_10008_2_6_1	
uid_1_2_840_10008_2_16_4	
uid_1_2_840_10008_3_1_1_1	
uid_1_2_840_10008_3_1_2_1_1	
uid_1_2_840_10008_3_1_2_1_4	
uid_1_2_840_10008_3_1_2_2_1	
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uid_1_2_840_10008_5_1_1_4_2	
uid_1_2_840_10008_5_1_1_9	
uid_1_2_840_10008_5_1_1_9_1	
uid_1_2_840_10008_5_1_1_14	
uid_1_2_840_10008_5_1_1_15	
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uid_1_2_840_10008_5_1_1_16_376	
uid_1_2_840_10008_5_1_1_17	
uid_1_2_840_10008_5_1_1_17_376	
uid_1_2_840_10008_5_1_1_18	
uid_1_2_840_10008_5_1_1_18_1	
uid_1_2_840_10008_5_1_1_22	
uid_1_2_840_10008_5_1_1_23	
uid_1_2_840_10008_5_1_1_24	

## Enumerator

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uid_1_2_840_10008_5_1_1_31	
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uid_1_2_840_10008_5_1_1_33	
uid_1_2_840_10008_5_1_4_1_1_1	
uid_1_2_840_10008_5_1_4_1_1_1_1	
uid_1_2_840_10008_5_1_4_1_1_1_1_1	
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uid_1_2_840_10008_5_1_4_1_1_1_3	
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uid_1_2_840_10008_5_1_4_1_1_2	
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## Enumerator

uid_1_2_840_10008_5_1_4_1_1_12_1	
uid_1_2_840_10008_5_1_4_1_1_12_1_1	
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uid_1_2_840_10008_5_1_4_1_1_13_1_2	
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uid_1_2_840_10008_5_1_4_1_1_66_3	
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uid_1_2_840_10008_5_1_4_1_1_77_1_1↵ _1	
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uid_1_2_840_10008_5_1_4_1_1_77_1_2↵ _1	
uid_1_2_840_10008_5_1_4_1_1_77_1_3	
uid_1_2_840_10008_5_1_4_1_1_77_1_4	
uid_1_2_840_10008_5_1_4_1_1_77_1_4↵ _1	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↵ _1	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↵ _2	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↵ _3	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↵ _4	
uid_1_2_840_10008_5_1_4_1_1_88_1	
uid_1_2_840_10008_5_1_4_1_1_88_2	
uid_1_2_840_10008_5_1_4_1_1_88_3	
uid_1_2_840_10008_5_1_4_1_1_88_4	
uid_1_2_840_10008_5_1_4_1_1_88_11	
uid_1_2_840_10008_5_1_4_1_1_88_22	
uid_1_2_840_10008_5_1_4_1_1_88_33	
uid_1_2_840_10008_5_1_4_1_1_88_40	
uid_1_2_840_10008_5_1_4_1_1_88_50	
uid_1_2_840_10008_5_1_4_1_1_88_59	
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uid_1_2_840_10008_5_1_4_1_1_88_67	
uid_1_2_840_10008_5_1_4_1_1_104_1	



## Enumerator

uid_1_2_840_10008_5_1_4_1_1_104_2	
uid_1_2_840_10008_5_1_4_1_1_128	
uid_1_2_840_10008_5_1_4_1_1_129	
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uid_1_2_840_10008_5_1_4_1_1_481_2	
uid_1_2_840_10008_5_1_4_1_1_481_3	
uid_1_2_840_10008_5_1_4_1_1_481_4	
uid_1_2_840_10008_5_1_4_1_1_481_5	
uid_1_2_840_10008_5_1_4_1_1_481_6	
uid_1_2_840_10008_5_1_4_1_1_481_7	
uid_1_2_840_10008_5_1_4_1_1_481_8	
uid_1_2_840_10008_5_1_4_1_1_481_9	
uid_1_2_840_10008_5_1_4_1_2_1_1	
uid_1_2_840_10008_5_1_4_1_2_1_2	
uid_1_2_840_10008_5_1_4_1_2_1_3	
uid_1_2_840_10008_5_1_4_1_2_2_1	
uid_1_2_840_10008_5_1_4_1_2_2_2	
uid_1_2_840_10008_5_1_4_1_2_2_3	
uid_1_2_840_10008_5_1_4_1_2_3_1	
uid_1_2_840_10008_5_1_4_1_2_3_2	
uid_1_2_840_10008_5_1_4_1_2_3_3	
uid_1_2_840_10008_5_1_4_31	
uid_1_2_840_10008_5_1_4_32_1	
uid_1_2_840_10008_5_1_4_32_2	
uid_1_2_840_10008_5_1_4_32_3	
uid_1_2_840_10008_5_1_4_32	
uid_1_2_840_10008_5_1_4_33	
uid_1_2_840_10008_5_1_4_34_1	
uid_1_2_840_10008_5_1_4_34_2	
uid_1_2_840_10008_5_1_4_34_3	
uid_1_2_840_10008_5_1_4_34_4	
uid_1_2_840_10008_5_1_4_34_4_1	
uid_1_2_840_10008_5_1_4_34_4_2	
uid_1_2_840_10008_5_1_4_34_4_3	
uid_1_2_840_10008_5_1_4_34_4_4	
uid_1_2_840_10008_5_1_4_34_5	
uid_1_2_840_10008_5_1_4_37_1	
uid_1_2_840_10008_5_1_4_37_2	
uid_1_2_840_10008_5_1_4_37_3	
uid_1_2_840_10008_5_1_4_38_1	
uid_1_2_840_10008_5_1_4_38_2	
uid_1_2_840_10008_5_1_4_38_3	
uid_1_2_840_10008_5_1_4_41	
uid_1_2_840_10008_5_1_4_42	
uid_1_2_840_10008_15_0_3_1	
uid_1_2_840_10008_15_0_3_2	

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uid_1_2_840_10008_15_0_3_3	
uid_1_2_840_10008_15_0_3_4	
uid_1_2_840_10008_15_0_3_5	
uid_1_2_840_10008_15_0_3_6	
uid_1_2_840_10008_15_0_3_7	
uid_1_2_840_10008_15_0_3_8	
uid_1_2_840_10008_15_0_3_9	
uid_1_2_840_10008_15_0_3_10	
uid_1_2_840_10008_15_0_3_11	
uid_1_2_840_10008_15_0_3_12	
uid_1_2_840_10008_15_0_3_13	
uid_1_2_840_10008_15_0_3_14	
uid_1_2_840_10008_15_0_3_15	
uid_1_2_840_10008_15_0_3_16	
uid_1_2_840_10008_15_0_3_17	
uid_1_2_840_10008_15_0_3_18	
uid_1_2_840_10008_15_0_3_19	
uid_1_2_840_10008_15_0_3_20	
uid_1_2_840_10008_15_0_3_21	
uid_1_2_840_10008_15_0_3_22	
uid_1_2_840_10008_15_0_3_23	
uid_1_2_840_10008_15_0_3_24	
uid_1_2_840_10008_15_0_3_25	
uid_1_2_840_10008_15_0_3_26	
uid_1_2_840_10008_15_0_3_27	
uid_1_2_840_10008_15_0_3_28	
uid_1_2_840_10008_15_0_3_29	
uid_1_2_840_10008_15_0_3_30	
uid_1_2_840_10008_15_0_3_31	
uid_1_2_840_10008_15_0_4_1	
uid_1_2_840_10008_15_0_4_2	
uid_1_2_840_10008_15_0_4_3	
uid_1_2_840_10008_15_0_4_4	
uid_1_2_840_10008_15_0_4_5	
uid_1_2_840_10008_15_0_4_6	
uid_1_2_840_10008_15_0_4_7	
uid_1_2_840_10008_15_0_4_8	
uid_1_2_840_10008_5_1_4_1_1_77_1_6	
uid_1_2_840_10008_5_1_4_1_1_6_2	
uid_1_2_840_10008_5_1_4_1_1_66_5	
uid_1_2_840_10008_5_1_4_1_1_13_1_3	
uid_1_2_840_10008_5_1_4_1_1_2_2	
uid_1_2_840_10008_5_1_4_1_1_4_4	
uid_1_2_840_10008_5_1_4_1_1_128_1	
uid_1_2_840_10008_1_2_4_101	
uid_1_2_840_10008_1_2_4_102	

## Enumerator

uid_1_2_840_10008_1_2_4_103	
uid_1_2_840_10008_1_5_2	
uid_1_2_840_10008_1_5_3	
uid_1_2_840_10008_1_5_4	
uid_1_2_840_10008_1_5_5	
uid_1_2_840_10008_1_5_6	
uid_1_2_840_10008_1_5_7	
uid_1_2_840_10008_1_5_8	
uid_1_2_840_10008_1_20	
uid_1_2_840_10008_2_16_5	
uid_1_2_840_10008_2_16_6	
uid_1_2_840_10008_2_16_7	
uid_1_2_840_10008_2_16_8	
uid_1_2_840_10008_2_16_9	
uid_1_2_840_10008_2_16_10	
uid_1_2_840_10008_2_16_11	
uid_1_2_840_10008_2_16_12	
uid_1_2_840_10008_2_16_13	
uid_1_2_840_10008_2_16_14	
uid_1_2_840_10008_5_1_1_40	
uid_1_2_840_10008_5_1_1_40_1	
uid_1_2_840_10008_5_1_4_1_1_9_4_2	
uid_1_2_840_10008_5_1_4_1_1_9_5_1	
uid_1_2_840_10008_5_1_4_1_1_9_6_1	
uid_1_2_840_10008_5_1_4_1_1_11_5	
uid_1_2_840_10008_5_1_4_1_1_11_6	
uid_1_2_840_10008_1_2_4_104	
uid_1_2_840_10008_1_2_4_105	
uid_1_2_840_10008_1_2_4_106	
uid_1_2_840_10008_1_2_4_107	
uid_1_2_840_10008_1_2_4_108	
uid_1_2_840_10008_1_5_1	
uid_1_2_840_10008_5_1_4_1_1_11_7	
uid_1_2_840_10008_5_1_4_1_1_11_8	
uid_1_2_840_10008_5_1_4_1_1_11_9	
uid_1_2_840_10008_5_1_4_1_1_11_10	
uid_1_2_840_10008_5_1_4_1_1_11_11	
uid_1_2_840_10008_5_1_4_1_1_12_77	
uid_1_2_840_10008_5_1_4_1_1_13_1_4	
uid_1_2_840_10008_5_1_4_1_1_13_1_5	
uid_1_2_840_10008_5_1_4_1_1_14_1	
uid_1_2_840_10008_5_1_4_1_1_14_2	
uid_1_2_840_10008_5_1_4_1_1_30	
uid_1_2_840_10008_5_1_4_1_1_40	
uid_1_2_840_10008_5_1_4_1_1_66_6	
uid_1_2_840_10008_5_1_4_1_1_68_1	

## Enumerator

uid_1_2_840_10008_5_1_4_1_1_68_2	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↔ _5	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↔ _6	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↔ _7	
uid_1_2_840_10008_5_1_4_1_1_77_1_5↔ _8	
uid_1_2_840_10008_5_1_4_1_1_78_1	
uid_1_2_840_10008_5_1_4_1_1_78_2	
uid_1_2_840_10008_5_1_4_1_1_78_3	
uid_1_2_840_10008_5_1_4_1_1_78_4	
uid_1_2_840_10008_5_1_4_1_1_78_5	
uid_1_2_840_10008_5_1_4_1_1_78_6	
uid_1_2_840_10008_5_1_4_1_1_78_7	
uid_1_2_840_10008_5_1_4_1_1_78_8	
uid_1_2_840_10008_5_1_4_1_1_79_1	
uid_1_2_840_10008_5_1_4_1_1_80_1	
uid_1_2_840_10008_5_1_4_1_1_81_1	
uid_1_2_840_10008_5_1_4_1_1_82_1	
uid_1_2_840_10008_5_1_4_1_1_88_34	
uid_1_2_840_10008_5_1_4_1_1_88_35	
uid_1_2_840_10008_5_1_4_1_1_88_68	
uid_1_2_840_10008_5_1_4_1_1_88_69	
uid_1_2_840_10008_5_1_4_1_1_88_70	
uid_1_2_840_10008_5_1_4_1_1_88_71	
uid_1_2_840_10008_5_1_4_1_1_88_72	
uid_1_2_840_10008_5_1_4_1_1_88_73	
uid_1_2_840_10008_5_1_4_1_1_88_74	
uid_1_2_840_10008_5_1_4_1_1_88_75	
uid_1_2_840_10008_5_1_4_1_1_90_1	
uid_1_2_840_10008_5_1_4_1_1_104_3	
uid_1_2_840_10008_5_1_4_1_1_130	
uid_1_2_840_10008_5_1_4_1_1_131	
uid_1_2_840_10008_5_1_4_1_1_200_1	
uid_1_2_840_10008_5_1_4_1_1_200_2	
uid_1_2_840_10008_5_1_4_1_1_200_3	
uid_1_2_840_10008_5_1_4_1_1_200_4	
uid_1_2_840_10008_5_1_4_1_1_200_5	
uid_1_2_840_10008_5_1_4_1_1_200_6	
uid_1_2_840_10008_5_1_4_1_1_481_10	
uid_1_2_840_10008_5_1_4_1_1_481_11	
uid_1_2_840_10008_5_1_4_1_1_501_1	
uid_1_2_840_10008_5_1_4_1_1_501_2_1	
uid_1_2_840_10008_5_1_4_1_1_501_2_2	
uid_1_2_840_10008_5_1_4_1_1_501_3	

## Enumerator

uid_1_2_840_10008_5_1_4_1_1_501_4	
uid_1_2_840_10008_5_1_4_1_1_501_5	
uid_1_2_840_10008_5_1_4_1_1_501_6	
uid_1_2_840_10008_5_1_4_1_1_601_1	
uid_1_2_840_10008_5_1_4_1_1_601_2	
uid_1_2_840_10008_5_1_4_1_2_4_2	
uid_1_2_840_10008_5_1_4_1_2_4_3	
uid_1_2_840_10008_5_1_4_1_2_5_3	
uid_1_2_840_10008_5_1_4_20_1	
uid_1_2_840_10008_5_1_4_20_2	
uid_1_2_840_10008_5_1_4_20_3	
uid_1_2_840_10008_5_1_4_34_5_1	
uid_1_2_840_10008_5_1_4_34_6	
uid_1_2_840_10008_5_1_4_34_6_1	
uid_1_2_840_10008_5_1_4_34_6_2	
uid_1_2_840_10008_5_1_4_34_6_3	
uid_1_2_840_10008_5_1_4_34_6_4	
uid_1_2_840_10008_5_1_4_34_7	
uid_1_2_840_10008_5_1_4_34_8	
uid_1_2_840_10008_5_1_4_34_9	
uid_1_2_840_10008_5_1_4_34_10	
uid_1_2_840_10008_5_1_4_38_4	
uid_1_2_840_10008_5_1_4_39_1	
uid_1_2_840_10008_5_1_4_39_2	
uid_1_2_840_10008_5_1_4_39_3	
uid_1_2_840_10008_5_1_4_39_4	
uid_1_2_840_10008_5_1_4_43_1	
uid_1_2_840_10008_5_1_4_43_2	
uid_1_2_840_10008_5_1_4_43_3	
uid_1_2_840_10008_5_1_4_43_4	
uid_1_2_840_10008_5_1_4_44_1	
uid_1_2_840_10008_5_1_4_44_2	
uid_1_2_840_10008_5_1_4_44_3	
uid_1_2_840_10008_5_1_4_44_4	
uid_1_2_840_10008_5_1_4_45_1	
uid_1_2_840_10008_5_1_4_45_2	
uid_1_2_840_10008_5_1_4_45_3	
uid_1_2_840_10008_5_1_4_45_4	
uid_1_2_840_10008_7_1_1	
uid_1_2_840_10008_7_1_2	
uid_1_2_840_10008_8_1_1	
uid_1_2_840_10008_5_1_4_1_1_4_3	
uid_1_2_840_10008_15_1_1	

## 10.324.4 Member Function Documentation

### 10.324.4.1 GetName()

```
const char * gdcM::UIDs::GetName ( ) const
```

When object is Initialize function return the well known name associated with uid return NULL when not initialized

#### Examples

[GenerateStandardSOPClasses.cxx](#).

Referenced by [gdcM::operator<<\(\)](#).

### 10.324.4.2 GetNumberOfTransferSyntaxStrings()

```
static unsigned int gdcM::UIDs::GetNumberOfTransferSyntaxStrings ( ) [static]
```

### 10.324.4.3 GetString()

```
const char * gdcM::UIDs::GetString ( ) const
```

When object is Initialize function return the uid return NULL when not initialized

#### Examples

[GenerateStandardSOPClasses.cxx](#).

Referenced by [gdcM::operator<<\(\)](#).

### 10.324.4.4 GetTransferSyntaxString()

```
static const char *const * gdcM::UIDs::GetTransferSyntaxString (
    unsigned int ts ) [static]
```

#### 10.324.4.5 GetTransferSyntaxStrings()

```
static TransferSyntaxStringsType gdcm::UIDs::GetTransferSyntaxStrings ( ) [static]
```

#### 10.324.4.6 GetUIDName()

```
static const char * gdcm::UIDs::GetUIDName (
    unsigned int ts ) [static]
```

#### 10.324.4.7 GetUIDString()

```
static const char * gdcm::UIDs::GetUIDString (
    unsigned int ts ) [static]
```

#### 10.324.4.8 operator TType()

```
gdcm::UIDs::operator TType ( ) const [inline]
```

#### 10.324.4.9 SetFromUID()

```
bool gdcm::UIDs::SetFromUID (
    const char * str )
```

Initialize object from a string (a uid number) return false on error, and internal state is set to 0

#### Examples

[GenerateStandardSOPClasses.cxx](#).

The documentation for this class was generated from the following file:

- [gdcmUIDs.h](#)

## 10.325 gdcm::network::ULAction Class Reference

[ULAction.](#)

```
#include <gdcmULAction.h>
```

Inheritance diagram for gdcm::network::ULAction:

### Public Member Functions

- [ULAction](#) ()=default
- [ULAction](#) (const [ULAction](#) &inAction)=delete
- virtual [~ULAction](#) ()=default
- void [operator=](#) (const [ULAction](#) &)=delete
- virtual [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaiting↔  
ForEvent, [EEventID](#) &outRaisedEvent)=0

### 10.325.1 Detailed Description

[ULAction.](#)

A [ULConnection](#) in a given ULState can perform certain ULActions. This base class provides the interface for running those ULActions on a given [ULConnection](#).

Essentially, the [ULConnectionManager](#) will take this object, determined from the current ULState of the [ULConnection](#), and pass the [ULConnection](#) object to the [ULAction](#). The [ULAction](#) will then invoke whatever necessary commands are required by a given action.

The result of a [ULAction](#) is a [ULEvent](#) (ie, what happened as a result of the action).

This [ULEvent](#) is passed to the ULState, so that the transition to the next state can occur.

Actions are associated with Payloads – be those filestreams, AETitles to establish connections, whatever. The actual parameters that the user will pass via an action will come through a Payload object, which should, in itself, be some gdcm-based object (but not all objects can be payloads; sending a single dataelement as a payload isn't meaningful). As such, each action has its own particular payload.

For the sake of keeping files together, both the particular payload class and the action class will be defined in the same header file. Payloads should JUST be data (or streams), NO METHODS.

Some actions perform changes that should raise events on the local system, and some actions perform changes that will require waiting for events from the remote system.

Therefore, this base action has been modified so that those events are set by each action. When the event loop runs an action, it will then test to see if a local event was raised by the action, and if so, perform the appropriate subsequent action. If the action requires waiting for a response from the remote system, then the event loop will sit there (presumably with the ARTIM timer running) and wait for a response from the remote system. Once a response is obtained, then the the rest of the state transitions can happen.



## 10.325.2 Constructor & Destructor Documentation

### 10.325.2.1 ULAction() [1/2]

```
gdcm::network::ULAction::ULAction ( ) [default]
```

### 10.325.2.2 ~ULAction()

```
virtual gdcm::network::ULAction::~~ULAction ( ) [virtual], [default]
```

### 10.325.2.3 ULAction() [2/2]

```
gdcm::network::ULAction::ULAction (
    const ULAction & inAction ) [delete]
```

## 10.325.3 Member Function Documentation

### 10.325.3.1 operator=()

```
void gdcm::network::ULAction::operator= (
    const ULAction & ) [delete]
```

### 10.325.3.2 PerformAction()

```
virtual EStateID gdcm::network::ULAction::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [pure virtual]
```

Implemented in [gdcm::network::ULActionAA1](#), [gdcm::network::ULActionAA2](#), [gdcm::network::ULActionAA3](#), [gdcm::network::ULActionAA4](#), [gdcm::network::ULActionAA5](#), [gdcm::network::ULActionAA6](#), [gdcm::network::ULActionAA7](#), [gdcm::network::ULActionAA8](#), [gdcm::network::ULActionAE1](#), [gdcm::network::ULActionAE2](#), [gdcm::network::ULActionAE3](#), [gdcm::network::ULActionAE4](#), [gdcm::network::ULActionAE5](#), [gdcm::network::ULActionAE6](#), [gdcm::network::ULActionAE7](#), [gdcm::network::ULActionAE8](#), [gdcm::network::ULActionAR1](#), [gdcm::network::ULActionAR2](#), [gdcm::network::ULActionAR3](#), [gdcm::network::ULActionAR4](#), [gdcm::network::ULActionAR5](#), [gdcm::network::ULActionAR6](#), [gdcm::network::ULActionAR7](#), [gdcm::network::ULActionAR8](#), [gdcm::network::ULActionAR9](#), [gdcm::network::ULActionAR10](#), [gdcm::network::ULActionDT1](#), and [gdcm::network::ULActionDT2](#).

The documentation for this class was generated from the following file:

- [gdcmULAction.h](#)

## 10.326 gdcm::network::ULActionAA1 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA1:

Collaboration diagram for gdcm::network::ULActionAA1:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.326.1 Member Function Documentation

#### 10.326.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.327 gdcm::network::ULActionAA2 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA2:

Collaboration diagram for gdcm::network::ULActionAA2:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.327.1 Member Function Documentation

### 10.327.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.328 gdcm::network::ULActionAA3 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for [gdcm::network::ULActionAA3](#):

Collaboration diagram for [gdcm::network::ULActionAA3](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.328.1 Member Function Documentation

### 10.328.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA3::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.329 gdcm::network::ULActionAA4 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA4:

Collaboration diagram for gdcm::network::ULActionAA4:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.329.1 Member Function Documentation

#### 10.329.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA4::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.330 gdcm::network::ULActionAA5 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA5:

Collaboration diagram for gdcm::network::ULActionAA5:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.330.1 Member Function Documentation

### 10.330.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA5::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.331 gdcm::network::ULActionAA6 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for [gdcm::network::ULActionAA6](#):

Collaboration diagram for [gdcm::network::ULActionAA6](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.331.1 Member Function Documentation

### 10.331.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA6::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.332 gdcm::network::ULActionAA7 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA7:

Collaboration diagram for gdcm::network::ULActionAA7:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.332.1 Member Function Documentation

#### 10.332.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA7::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.333 gdcm::network::ULActionAA8 Class Reference

```
#include <gdcmULActionAA.h>
```

Inheritance diagram for gdcm::network::ULActionAA8:

Collaboration diagram for gdcm::network::ULActionAA8:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.333.1 Member Function Documentation

#### 10.333.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAA8::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAA.h](#)

## 10.334 gdcm::network::ULActionAE1 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for [gdcm::network::ULActionAE1](#):

Collaboration diagram for [gdcm::network::ULActionAE1](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.334.1 Member Function Documentation

#### 10.334.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.335 gdcm::network::ULActionAE2 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE2:

Collaboration diagram for gdcm::network::ULActionAE2:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.335.1 Member Function Documentation

#### 10.335.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.336 gdcm::network::ULActionAE3 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE3:

Collaboration diagram for gdcm::network::ULActionAE3:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override



## 10.336.1 Member Function Documentation

### 10.336.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE3::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.337 gdcm::network::ULActionAE4 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for [gdcm::network::ULActionAE4](#):

Collaboration diagram for [gdcm::network::ULActionAE4](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.337.1 Member Function Documentation

### 10.337.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE4::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.338 gdcm::network::ULActionAE5 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE5:

Collaboration diagram for gdcm::network::ULActionAE5:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.338.1 Member Function Documentation

#### 10.338.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE5::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.339 gdcm::network::ULActionAE6 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE6:

Collaboration diagram for gdcm::network::ULActionAE6:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.339.1 Member Function Documentation

### 10.339.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE6::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.340 gdcm::network::ULActionAE7 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for [gdcm::network::ULActionAE7](#):

Collaboration diagram for [gdcm::network::ULActionAE7](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.340.1 Member Function Documentation

### 10.340.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE7::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.341 gdcm::network::ULActionAE8 Class Reference

```
#include <gdcmULActionAE.h>
```

Inheritance diagram for gdcm::network::ULActionAE8:

Collaboration diagram for gdcm::network::ULActionAE8:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.341.1 Member Function Documentation

#### 10.341.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAE8::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAE.h](#)

## 10.342 gdcm::network::ULActionAR1 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR1:

Collaboration diagram for gdcm::network::ULActionAR1:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.342.1 Member Function Documentation

### 10.342.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.343 gdcm::network::ULActionAR10 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for [gdcm::network::ULActionAR10](#):

Collaboration diagram for [gdcm::network::ULActionAR10](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.343.1 Member Function Documentation

### 10.343.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR10::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.344 gdcm::network::ULActionAR2 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR2:

Collaboration diagram for gdcm::network::ULActionAR2:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.344.1 Member Function Documentation

#### 10.344.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.345 gdcm::network::ULActionAR3 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR3:

Collaboration diagram for gdcm::network::ULActionAR3:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.345.1 Member Function Documentation

### 10.345.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR3::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.346 gdcm::network::ULActionAR4 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for [gdcm::network::ULActionAR4](#):

Collaboration diagram for [gdcm::network::ULActionAR4](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.346.1 Member Function Documentation

### 10.346.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR4::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.347 gdcm::network::ULActionAR5 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR5:

Collaboration diagram for gdcm::network::ULActionAR5:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.347.1 Member Function Documentation

#### 10.347.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR5::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.348 gdcm::network::ULActionAR6 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR6:

Collaboration diagram for gdcm::network::ULActionAR6:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override



## 10.348.1 Member Function Documentation

### 10.348.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR6::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.349 gdcm::network::ULActionAR7 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for [gdcm::network::ULActionAR7](#):

Collaboration diagram for [gdcm::network::ULActionAR7](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.349.1 Member Function Documentation

### 10.349.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR7::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.350 gdcm::network::ULActionAR8 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR8:

Collaboration diagram for gdcm::network::ULActionAR8:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.350.1 Member Function Documentation

#### 10.350.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR8::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.351 gdcm::network::ULActionAR9 Class Reference

```
#include <gdcmULActionAR.h>
```

Inheritance diagram for gdcm::network::ULActionAR9:

Collaboration diagram for gdcm::network::ULActionAR9:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.351.1 Member Function Documentation

### 10.351.1.1 PerformAction()

```
EStateID gdcm::network::ULActionAR9::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionAR.h](#)

## 10.352 gdcm::network::ULActionDT1 Class Reference

```
#include <gdcmULActionDT.h>
```

Inheritance diagram for [gdcm::network::ULActionDT1](#):

Collaboration diagram for [gdcm::network::ULActionDT1](#):

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

## 10.352.1 Member Function Documentation

### 10.352.1.1 PerformAction()

```
EStateID gdcm::network::ULActionDT1::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionDT.h](#)

## 10.353 gdcm::network::ULActionDT2 Class Reference

```
#include <gdcmULActionDT.h>
```

Inheritance diagram for `gdcm::network::ULActionDT2`:

Collaboration diagram for `gdcm::network::ULActionDT2`:

### Public Member Functions

- [EStateID PerformAction](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) override

### 10.353.1 Member Function Documentation

#### 10.353.1.1 PerformAction()

```
EStateID gdcm::network::ULActionDT2::PerformAction (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) [override], [virtual]
```

Implements [gdcm::network::ULAction](#).

The documentation for this class was generated from the following file:

- [gdcmULActionDT.h](#)

## 10.354 gdcm::network::ULBasicCallback Class Reference

[ULBasicCallback](#).

```
#include <gdcmULBasicCallback.h>
```

Inheritance diagram for `gdcm::network::ULBasicCallback`:

Collaboration diagram for `gdcm::network::ULBasicCallback`:

## Public Member Functions

- [ULBasicCallback](#) ()=default
- [~ULBasicCallback](#) () override=default
- std::vector< [DataSet](#) > const & [GetDataSets](#) () const
- std::vector< [DataSet](#) > const & [GetResponses](#) () const
- void [HandleDataSet](#) (const [DataSet](#) &inDataSet) override
- void [HandleResponse](#) (const [DataSet](#) &inDataSet) override

## Additional Inherited Members

### 10.354.1 Detailed Description

[ULBasicCallback](#).

This is the most basic of callbacks for how the [ULConnectionManager](#) handles incoming datasets. DataSets are just concatenated to the mDataSets vector, and the result can be pulled out of the vector by later code. Alternatives to this method include progress updates, saving to disk, etc. This class is NOT THREAD SAFE. Access the dataset vector after the entire set of datasets has been returned by the [ULConnectionManager](#).

### 10.354.2 Constructor & Destructor Documentation

#### 10.354.2.1 ULBasicCallback()

```
gdcm::network::ULBasicCallback::ULBasicCallback ( ) [default]
```

#### 10.354.2.2 ~ULBasicCallback()

```
gdcm::network::ULBasicCallback::~~ULBasicCallback ( ) [override], [default]
```

### 10.354.3 Member Function Documentation

#### 10.354.3.1 GetDataSets()

```
std::vector< DataSet > const & gdcm::network::ULBasicCallback::GetDataSets ( ) const
```

### 10.354.3.2 GetResponses()

```
std::vector< DataSet > const & gdcm::network::ULBasicCallback::GetResponses ( ) const
```

### 10.354.3.3 HandleDataSet()

```
void gdcm::network::ULBasicCallback::HandleDataSet (
    const DataSet & inDataSet ) [override], [virtual]
```

Implements [gdcm::network::ULConnectionCallback](#).

### 10.354.3.4 HandleResponse()

```
void gdcm::network::ULBasicCallback::HandleResponse (
    const DataSet & inDataSet ) [override], [virtual]
```

Implements [gdcm::network::ULConnectionCallback](#).

The documentation for this class was generated from the following file:

- [gdcmULBasicCallback.h](#)

## 10.355 gdcm::network::ULConnection Class Reference

[ULConnection](#).

```
#include <gdcmULConnection.h>
```

## Public Member Functions

- [ULConnection](#) (const [ULConnection](#) &)=delete
- [ULConnection](#) (const [ULConnectionInfo](#) &inUserInformation)
- virtual [~ULConnection](#) ()
- void [AddAcceptedPresentationContext](#) (const [PresentationContextAC](#) &inPC)
- [PresentationContextRQ](#) [FindContext](#) (const [DataElement](#) &de) const
- std::vector< [PresentationContextAC](#) > & [GetAcceptedPresentationContexts](#) ()
- std::vector< [PresentationContextAC](#) > const & [GetAcceptedPresentationContexts](#) () const
- const [ULConnectionInfo](#) & [GetConnectionInfo](#) () const
- uint32\_t [GetMaxPDUSize](#) () const
- const [PresentationContextAC](#) \* [GetPresentationContextACByID](#) (uint8\_t id) const
- uint8\_t [GetPresentationContextIDFromPresentationContext](#) ([PresentationContextRQ](#) const &pc) const  
*return 0 upon error*
- const [PresentationContextRQ](#) \* [GetPresentationContextRQByID](#) (uint8\_t id) const
- std::vector< [PresentationContextRQ](#) > const & [GetPresentationContexts](#) () const
- std::iostream \* [GetProtocol](#) ()
- [EStateID](#) [GetState](#) () const
- [ARTIMTimer](#) & [GetTimer](#) ()
- bool [InitializeConnection](#) ()  
*used to establish scu connections*
- bool [InitializeIncomingConnection](#) ()  
*used to establish scp connections*
- void [operator=](#) (const [ULConnection](#) &)=delete
- void [SetMaxPDUSize](#) (uint32\_t inSize)
- void [SetPresentationContexts](#) (const std::vector< [PresentationContext](#) > &inContexts)
- void [SetPresentationContexts](#) (const std::vector< [PresentationContextRQ](#) > &inContexts)
- void [SetState](#) (const [EStateID](#) &inState)
- void [StopProtocol](#) ()

## Friends

- class [ULActionAE6](#)
- class [ULConnectionManager](#)

### 10.355.1 Detailed Description

#### [ULConnection](#).

This is the class that contains the socket to another machine, and passes data through itself, as well as maintaining a sense of state.

The [ULConnectionManager](#) tells the [ULConnection](#) what data can actually be sent.

This class is done this way so that it can be eventually be replaced with a [ULSecureConnection](#), if such a protocol is warranted, so that all data that passes through can be managed through a secure connection. For now, this class provides a simple pass-through mechanism to the socket itself.

So, for instance, a gdcmm object will be passes to this object, and it will then get passed along the connection, if that connection is in the proper state to do so.

For right now, this class is not directly intended to be inherited from, but the potential for future [ULSecureConnection](#) warrants the addition, rather than having everything be managed from within the [ULConnectionManager](#) (or this class) without a wrapper.

## 10.355.2 Constructor & Destructor Documentation

### 10.355.2.1 ULConnection() [1/2]

```
gdcM::network::ULConnection::ULConnection (
    const ULConnectionInfo & inUserInfo )
```

### 10.355.2.2 ~ULConnection()

```
virtual gdcM::network::ULConnection::~~ULConnection ( ) [virtual]
```

### 10.355.2.3 ULConnection() [2/2]

```
gdcM::network::ULConnection::ULConnection (
    const ULConnection & ) [delete]
```

## 10.355.3 Member Function Documentation

### 10.355.3.1 AddAcceptedPresentationContext()

```
void gdcM::network::ULConnection::AddAcceptedPresentationContext (
    const PresentationContextAC & inPC )
```

### 10.355.3.2 FindContext()

```
PresentationContextRQ gdcM::network::ULConnection::FindContext (
    const DataElement & de ) const
```



### 10.355.3.3 GetAcceptedPresentationContexts() [1/2]

```
std::vector< PresentationContextAC > & gdcm::network::ULConnection::GetAcceptedPresentation←  
Contexts ( )
```

### 10.355.3.4 GetAcceptedPresentationContexts() [2/2]

```
std::vector< PresentationContextAC > const & gdcm::network::ULConnection::GetAcceptedPresentation←  
Contexts ( ) const
```

### 10.355.3.5 GetConnectionInfo()

```
const ULConnectionInfo & gdcm::network::ULConnection::GetConnectionInfo ( ) const
```

### 10.355.3.6 GetMaxPDUSize()

```
uint32_t gdcm::network::ULConnection::GetMaxPDUSize ( ) const
```

### 10.355.3.7 GetPresentationContextACByID()

```
const PresentationContextAC * gdcm::network::ULConnection::GetPresentationContextACByID (   
    uint8_t id ) const
```

### 10.355.3.8 GetPresentationContextIDFromPresentationContext()

```
uint8_t gdcm::network::ULConnection::GetPresentationContextIDFromPresentationContext (   
    PresentationContextRQ const & pc ) const
```

return 0 upon error

#### 10.355.3.9 GetPresentationContextRQByID()

```
const PresentationContextRQ * gdcm::network::ULConnection::GetPresentationContextRQByID (
    uint8_t id ) const
```

#### 10.355.3.10 GetPresentationContexts()

```
std::vector< PresentationContextRQ > const & gdcm::network::ULConnection::GetPresentationContexts
( ) const
```

#### 10.355.3.11 GetProtocol()

```
std::iostream * gdcm::network::ULConnection::GetProtocol ( )
```

#### 10.355.3.12 GetState()

```
EStateID gdcm::network::ULConnection::GetState ( ) const
```

#### 10.355.3.13 GetTimer()

```
ARTIMTimer & gdcm::network::ULConnection::GetTimer ( )
```

#### 10.355.3.14 InitializeConnection()

```
bool gdcm::network::ULConnection::InitializeConnection ( )
```

used to establish scu connections

### 10.355.3.15 InitializeIncomingConnection()

```
bool gdcm::network::ULConnection::InitializeIncomingConnection ( )
```

used to establish scp connections

### 10.355.3.16 operator=()

```
void gdcm::network::ULConnection::operator= (
    const ULConnection & ) [delete]
```

### 10.355.3.17 SetMaxPDUSize()

```
void gdcm::network::ULConnection::SetMaxPDUSize (
    uint32_t inSize )
```

### 10.355.3.18 SetPresentationContexts() [1/2]

```
void gdcm::network::ULConnection::SetPresentationContexts (
    const std::vector< PresentationContext > & inContexts )
```

### 10.355.3.19 SetPresentationContexts() [2/2]

```
void gdcm::network::ULConnection::SetPresentationContexts (
    const std::vector< PresentationContextRQ > & inContexts )
```

### 10.355.3.20 SetState()

```
void gdcm::network::ULConnection::SetState (
    const EStateID & inState )
```

### 10.355.3.21 StopProtocol()

```
void gdcmm::network::ULConnection::StopProtocol ( )
```

## 10.355.4 Friends And Related Function Documentation

### 10.355.4.1 ULActionAE6

```
friend class ULActionAE6 [friend]
```

### 10.355.4.2 ULConnectionManager

```
friend class ULConnectionManager [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmULConnection.h](#)

## 10.356 gdcmm::network::ULConnectionCallback Class Reference

```
#include <gdcmmULConnectionCallback.h>
```

Inheritance diagram for gdcmm::network::ULConnectionCallback:

### Public Member Functions

- [ULConnectionCallback](#) ()
- virtual [~ULConnectionCallback](#) ()=default
- bool [DataSetHandles](#) () const
- virtual void [HandleDataSet](#) (const [DataSet](#) &inDataSet)=0
- virtual void [HandleResponse](#) (const [DataSet](#) &inDataSet)=0
- void [ResetHandledDataSet](#) ()
- void [SetImplicitFlag](#) (const bool imp)

### Protected Member Functions

- void [DataSetHandled](#) ()

## Protected Attributes

- bool [mImplicit](#)

### 10.356.1 Detailed Description

When a dataset comes back from a query/move/etc, the result can either be stored entirely in memory, or could be stored on disk. This class provides a mechanism to indicate what the [ULConnectionManager](#) should do with datasets that are produced through query results. The [ULConnectionManager](#) will call the `HandleDataSet` function during the course of receiving datasets. Particular implementations should fill in what that function does, including updating progress, etc. NOTE: since cmove requires that multiple event loops be employed, the callback function MUST set `mHandledData` ← Set to true. otherwise, the cmove event loop handler will not know data was received, and proceed to end the loop prematurely.

### 10.356.2 Constructor & Destructor Documentation

#### 10.356.2.1 ULConnectionCallback()

```
gdcm::network::ULConnectionCallback::ULConnectionCallback ( ) [inline]
```

#### 10.356.2.2 ~ULConnectionCallback()

```
virtual gdcm::network::ULConnectionCallback::~~ULConnectionCallback ( ) [virtual], [default]
```

### 10.356.3 Member Function Documentation

#### 10.356.3.1 DataSetHandled()

```
void gdcm::network::ULConnectionCallback::DataSetHandled ( ) [inline], [protected]
```

#### 10.356.3.2 DataSetHandles()

```
bool gdcm::network::ULConnectionCallback::DataSetHandles ( ) const [inline]
```

### 10.356.3.3 HandleDataSet()

```
virtual void gdcm::network::ULConnectionCallback::HandleDataSet (
    const DataSet & inDataSet ) [pure virtual]
```

Implemented in [gdcm::network::ULBasicCallback](#), and [gdcm::network::ULWritingCallback](#).

### 10.356.3.4 HandleResponse()

```
virtual void gdcm::network::ULConnectionCallback::HandleResponse (
    const DataSet & inDataSet ) [pure virtual]
```

Implemented in [gdcm::network::ULBasicCallback](#), and [gdcm::network::ULWritingCallback](#).

### 10.356.3.5 ResetHandledDataSet()

```
void gdcm::network::ULConnectionCallback::ResetHandledDataSet ( ) [inline]
```

### 10.356.3.6 SetImplicitFlag()

```
void gdcm::network::ULConnectionCallback::SetImplicitFlag (
    const bool imp ) [inline]
```

## 10.356.4 Member Data Documentation

### 10.356.4.1 mImplicit

```
bool gdcm::network::ULConnectionCallback::mImplicit [protected]
```

The documentation for this class was generated from the following file:

- [gdcmULConnectionCallback.h](#)

## 10.357 gdcm::network::ULConnectionInfo Class Reference

[ULConnectionInfo](#).

```
#include <gdcmULConnectionInfo.h>
```

### Public Member Functions

- [ULConnectionInfo](#) ()
- const char \* [GetCalledAETitle](#) () const
- std::string [GetCalledComputerName](#) () const
- unsigned long [GetCalledIPAddress](#) () const
- int [GetCalledIPPort](#) () const
- const char \* [GetCallingAETitle](#) () const
- unsigned long [GetMaxPDULength](#) () const
- bool [Initialize](#) ([UserInformation](#) const &inUserInformation, const char \*inCalledAETitle, const char \*inCallingAETitle, unsigned long inCalledIPAddress, int inCalledIPPort, std::string inCalledComputerName)
- void [SetMaxPDULength](#) (unsigned long inMaxPDULength)

### 10.357.1 Detailed Description

[ULConnectionInfo](#).

this class contains all the information about a particular connection as established by the user. That is, it's: User Information Calling AE Title Called AE Title IP address/computer name IP Port A connection must be established with this information, that's subsequently placed into various primitives for actual communication.

### 10.357.2 Constructor & Destructor Documentation

#### 10.357.2.1 ULConnectionInfo()

```
gdcm::network::ULConnectionInfo::ULConnectionInfo ( )
```

### 10.357.3 Member Function Documentation

#### 10.357.3.1 GetCalledAETitle()

```
const char * gdcm::network::ULConnectionInfo::GetCalledAETitle ( ) const
```

**10.357.3.2 GetCalledComputerName()**

```
std::string gdcn::network::ULConnectionInfo::GetCalledComputerName ( ) const
```

**10.357.3.3 GetCalledIPAddress()**

```
unsigned long gdcn::network::ULConnectionInfo::GetCalledIPAddress ( ) const
```

**10.357.3.4 GetCalledIPPort()**

```
int gdcn::network::ULConnectionInfo::GetCalledIPPort ( ) const
```

**10.357.3.5 GetCallingAETitle()**

```
const char * gdcn::network::ULConnectionInfo::GetCallingAETitle ( ) const
```

**10.357.3.6 GetMaxPDULength()**

```
unsigned long gdcn::network::ULConnectionInfo::GetMaxPDULength ( ) const
```

**10.357.3.7 Initialize()**

```
bool gdcn::network::ULConnectionInfo::Initialize (
    UserInformation const & inUserInformation,
    const char * inCalledAETitle,
    const char * inCallingAETitle,
    unsigned long inCalledIPAddress,
    int inCalledIPPort,
    std::string inCalledComputerName )
```



### 10.357.3.8 SetMaxPDULength()

```
void gdcm::network::ULConnectionInfo::SetMaxPDULength (
    unsigned long inMaxPDULength )
```

The documentation for this class was generated from the following file:

- [gdcmULConnectionInfo.h](#)

## 10.358 gdcm::network::ULConnectionManager Class Reference

[ULConnectionManager](#).

```
#include <gdcmULConnectionManager.h>
```

Inheritance diagram for gdcm::network::ULConnectionManager:

Collaboration diagram for gdcm::network::ULConnectionManager:

### Public Member Functions

- [ULConnectionManager](#) ()
- [~ULConnectionManager](#) () override
- bool [BreakConnection](#) (const double &inTimeout)
- void [BreakConnectionNow](#) ()
- bool [EstablishConnection](#) (const std::string &inAETitle, const std::string &inConnectAETitle, const std::string &inComputerName, long inIPAddress, uint16\_t inConnectPort, double inTimeout, std::vector< [PresentationContext](#) > const &pcVector)
- bool [EstablishConnectionMove](#) (const std::string &inAETitle, const std::string &inConnectAETitle, const std::string &inComputerName, long inIPAddress, uint16\_t inConnectPort, double inTimeout, uint16\_t inReturnPort, std::vector< [PresentationContext](#) > const &pcVector)
- std::vector< [PresentationDataValue](#) > [SendEcho](#) ()
- std::vector< [DataSet](#) > [SendFind](#) (const [BaseRootQuery](#) \*inRootQuery)
- void [SendFind](#) (const [BaseRootQuery](#) \*inRootQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendMove](#) (const [BaseRootQuery](#) \*inRootQuery)
- bool [SendMove](#) (const [BaseRootQuery](#) \*inRootQuery, [ULConnectionCallback](#) \*inCallback)  
*return false upon error*
- std::vector< [DataSet](#) > [SendNAction](#) (const [BaseQuery](#) \*inQuery)
- void [SendNAction](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNCreate](#) (const [BaseQuery](#) \*inQuery)
- void [SendNCreate](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNDelete](#) (const [BaseQuery](#) \*inQuery)
- void [SendNDelete](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNEventReport](#) (const [BaseQuery](#) \*inQuery)
- void [SendNEventReport](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNGet](#) (const [BaseQuery](#) \*inQuery)
- void [SendNGet](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendNSet](#) (const [BaseQuery](#) \*inQuery)
- void [SendNSet](#) (const [BaseQuery](#) \*inQuery, [ULConnectionCallback](#) \*inCallback)
- std::vector< [DataSet](#) > [SendStore](#) (const [File](#) &file, std::istream \*pStream=nullptr, std::streampos dataSetOffset=0)
- void [SendStore](#) (const [File](#) &file, [ULConnectionCallback](#) \*inCallback, std::istream \*pStream=nullptr, std::streampos dataSetOffset=0)  
*callback based API*

## Protected Member Functions

- [ULConnectionManager](#) (const [ULConnectionManager](#) &inCM)
- [EStateID](#) [RunEventLoop](#) ([ULEvent](#) &inEvent, [ULConnection](#) \*inWhichConnection, [ULConnectionCallback](#) \*inCallback, const bool &startWaiting)
- [EStateID](#) [RunMoveEventLoop](#) ([ULEvent](#) &inEvent, [ULConnectionCallback](#) \*inCallback)

## Protected Attributes

- [ULConnection](#) \* mConnection
- [ULConnection](#) \* mSecondaryConnection
- [ULTransitionTable](#) mTransitions

### 10.358.1 Detailed Description

[ULConnectionManager](#).

The [ULConnectionManager](#) performs actions on the [ULConnection](#) given inputs from the user and from the state of what's going on around the connection (ie, timeouts of the ARTIM timer, responses from the peer across the connection, etc).

Its inputs are ULEvents, and it performs ULActions.

### 10.358.2 Constructor & Destructor Documentation

#### 10.358.2.1 [ULConnectionManager](#)() [1/2]

```
gdcm::network::ULConnectionManager::ULConnectionManager (
    const ULConnectionManager & inCM ) [protected]
```

#### 10.358.2.2 [ULConnectionManager](#)() [2/2]

```
gdcm::network::ULConnectionManager::ULConnectionManager ( )
```

#### 10.358.2.3 [~ULConnectionManager](#)()

```
gdcm::network::ULConnectionManager::~~ULConnectionManager ( ) [override]
```

## 10.358.3 Member Function Documentation

### 10.358.3.1 BreakConnection()

```
bool gdcm::network::ULConnectionManager::BreakConnection (
    const double & inTimeout )
```

### 10.358.3.2 BreakConnectionNow()

```
void gdcm::network::ULConnectionManager::BreakConnectionNow ( )
```

### 10.358.3.3 EstablishConnection()

```
bool gdcm::network::ULConnectionManager::EstablishConnection (
    const std::string & inAETitle,
    const std::string & inConnectAETitle,
    const std::string & inComputerName,
    long inIPAddress,
    uint16_t inConnectPort,
    double inTimeout,
    std::vector< PresentationContext > const & pcVector )
```

returns true if a connection of the given AETitle (ie, 'this' program) is able to connect to the given AETitle and Port in a certain amount of time providing the connection type will establish the proper exchange syntax with a server; if a different functionality is required, a different connection should be established. returns false if the connection type is 'move'— have to give a return port for move to work as specified.

### 10.358.3.4 EstablishConnectionMove()

```
bool gdcm::network::ULConnectionManager::EstablishConnectionMove (
    const std::string & inAETitle,
    const std::string & inConnectAETitle,
    const std::string & inComputerName,
    long inIPAddress,
    uint16_t inConnectPort,
    double inTimeout,
    uint16_t inReturnPort,
    std::vector< PresentationContext > const & pcVector )
```

returns true for above reasons, but contains the special 'move' port

### 10.358.3.5 RunEventLoop()

```
EStateID gdcmm::network::ULConnectionManager::RunEventLoop (
    ULEvent & inEvent,
    ULConnection * inWhichConnection,
    ULConnectionCallback * inCallback,
    const bool & startWaiting ) [protected]
```

### 10.358.3.6 RunMoveEventLoop()

```
EStateID gdcmm::network::ULConnectionManager::RunMoveEventLoop (
    ULEvent & inEvent,
    ULConnectionCallback * inCallback ) [protected]
```

### 10.358.3.7 SendEcho()

```
std::vector< PresentationDataValue > gdcmm::network::ULConnectionManager::SendEcho ( )
```

### 10.358.3.8 SendFind() [1/2]

```
std::vector< DataSet > gdcmm::network::ULConnectionManager::SendFind (
    const BaseRootQuery * inRootQuery )
```

### 10.358.3.9 SendFind() [2/2]

```
void gdcmm::network::ULConnectionManager::SendFind (
    const BaseRootQuery * inRootQuery,
    ULConnectionCallback * inCallback )
```

### 10.358.3.10 SendMove() [1/2]

```
std::vector< DataSet > gdcmm::network::ULConnectionManager::SendMove (
    const BaseRootQuery * inRootQuery )
```

**10.358.3.11 SendMove()** [2/2]

```
bool gdcm::network::ULConnectionManager::SendMove (
    const BaseRootQuery * inRootQuery,
    ULConnectionCallback * inCallback )
```

return false upon error

**10.358.3.12 SendNAction()** [1/2]

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNAction (
    const BaseQuery * inQuery )
```

**10.358.3.13 SendNAction()** [2/2]

```
void gdcm::network::ULConnectionManager::SendNAction (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback )
```

**10.358.3.14 SendNCreate()** [1/2]

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNCreate (
    const BaseQuery * inQuery )
```

**10.358.3.15 SendNCreate()** [2/2]

```
void gdcm::network::ULConnectionManager::SendNCreate (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback )
```

**10.358.3.16 SendNDelete()** [1/2]

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendNDelete (
    const BaseQuery * inQuery )
```

**10.358.3.17 SendNDelete() [2/2]**

```
void gdcmm::network::ULConnectionManager::SendNDelete (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback )
```

**10.358.3.18 SendNEventReport() [1/2]**

```
std::vector< DataSet > gdcmm::network::ULConnectionManager::SendNEventReport (
    const BaseQuery * inQuery )
```

**10.358.3.19 SendNEventReport() [2/2]**

```
void gdcmm::network::ULConnectionManager::SendNEventReport (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback )
```

**10.358.3.20 SendNGet() [1/2]**

```
std::vector< DataSet > gdcmm::network::ULConnectionManager::SendNGet (
    const BaseQuery * inQuery )
```

**10.358.3.21 SendNGet() [2/2]**

```
void gdcmm::network::ULConnectionManager::SendNGet (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback )
```

**10.358.3.22 SendNSet() [1/2]**

```
std::vector< DataSet > gdcmm::network::ULConnectionManager::SendNSet (
    const BaseQuery * inQuery )
```

### 10.358.3.23 SendNSet() [2/2]

```
void gdcm::network::ULConnectionManager::SendNSet (
    const BaseQuery * inQuery,
    ULConnectionCallback * inCallback )
```

### 10.358.3.24 SendStore() [1/2]

```
std::vector< DataSet > gdcm::network::ULConnectionManager::SendStore (
    const File & file,
    std::istream * pStream = nullptr,
    std::streampos dataSetOffset = 0 )
```

### 10.358.3.25 SendStore() [2/2]

```
void gdcm::network::ULConnectionManager::SendStore (
    const File & file,
    ULConnectionCallback * inCallback,
    std::istream * pStream = nullptr,
    std::streampos dataSetOffset = 0 )
```

callback based API

## 10.358.4 Member Data Documentation

### 10.358.4.1 mConnection

`ULConnection*` gdcm::network::ULConnectionManager::mConnection [protected]

### 10.358.4.2 mSecondaryConnection

`ULConnection*` gdcm::network::ULConnectionManager::mSecondaryConnection [protected]

### 10.358.4.3 mTransitions

```
ULTransitionTable gdcmm::network::ULConnectionManager::mTransitions [protected]
```

The documentation for this class was generated from the following file:

- [gdcmmULConnectionManager.h](#)

## 10.359 gdcmm::network::ULEvent Class Reference

[ULEvent](#).

```
#include <gdcmmULEvent.h>
```

### Public Member Functions

- [ULEvent](#) (const [EEventID](#) &inEventID, [BasePDU](#) \*inBasePDU, std::istream \*iStream=nullptr, std::streampos posDataSet=0)
- [ULEvent](#) (const [EEventID](#) &inEventID, std::vector< [BasePDU](#) \* > inBasePDU, std::istream \*iStream=nullptr, std::streampos posDataSet=0)
- [~ULEvent](#) ()
- std::streampos [GetDataSetPos](#) () const
- [EEventID](#) [GetEvent](#) () const
- std::istream \* [GetStream](#) () const
- std::vector< [BasePDU](#) \* > const & [GetPDUs](#) () const
- void [SetEvent](#) (const [EEventID](#) &inEvent)
- void [SetPDU](#) (std::vector< [BasePDU](#) \* > const &inPDU)

### 10.359.1 Detailed Description

[ULEvent](#).

base class for network events.

An event consists of the event ID and the data associated with that event.

Note that once a PDU is created, it is now the responsibility of the associated event to destroy it!

### 10.359.2 Constructor & Destructor Documentation



### 10.359.2.1 ULEvent() [1/2]

```
gdcmm::network::ULEvent::ULEvent (
    const EEventID & inEventID,
    std::vector< BasePDU * > inBasePDU,
    std::istream * iStream = nullptr,
    std::streampos posDataSet = 0 ) [inline]
```

### 10.359.2.2 ULEvent() [2/2]

```
gdcmm::network::ULEvent::ULEvent (
    const EEventID & inEventID,
    BasePDU * inBasePDU,
    std::istream * iStream = nullptr,
    std::streampos posDataSet = 0 ) [inline]
```

### 10.359.2.3 ~ULEvent()

```
gdcmm::network::ULEvent::~~ULEvent ( ) [inline]
```

## 10.359.3 Member Function Documentation

### 10.359.3.1 GetDataSetPos()

```
std::streampos gdcmm::network::ULEvent::GetDataSetPos ( ) const [inline]
```

### 10.359.3.2 GetEvent()

```
EEventID gdcmm::network::ULEvent::GetEvent ( ) const [inline]
```

### 10.359.3.3 GetIStream()

```
std::istream * gdcmm::network::ULEvent::GetIStream ( ) const [inline]
```

#### 10.359.3.4 GetPDUs()

```
std::vector< BasePDU * > const & gdcmm::network::ULEvent::GetPDUs ( ) const [inline]
```

#### 10.359.3.5 SetEvent()

```
void gdcmm::network::ULEvent::SetEvent (
    const EEventID & inEvent ) [inline]
```

#### 10.359.3.6 SetPDU()

```
void gdcmm::network::ULEvent::SetPDU (
    std::vector< BasePDU * > const & inPDU ) [inline]
```

The documentation for this class was generated from the following file:

- [gdcmmULEvent.h](#)

## 10.360 gdcmm::network::ULTransitionTable Class Reference

[ULTransitionTable](#) The transition table of all the ULEvents, new ULActions, and ULStates.

```
#include <gdcmmULTransitionTable.h>
```

### Public Member Functions

- [ULTransitionTable](#) ()
- void [HandleEvent](#) ([Subject](#) \*s, [ULEvent](#) &inEvent, [ULConnection](#) &inConnection, bool &outWaitingForEvent, [EEventID](#) &outRaisedEvent) const
- void [PrintTable](#) () const

#### 10.360.1 Detailed Description

[ULTransitionTable](#) The transition table of all the ULEvents, new ULActions, and ULStates.

Based roughly on the solutions in `player2.cpp` in the boost examples and this so question: <http://stackoverflow.com/questions/1647631/c-state-machine-design>

The transition table is constructed of `TableRows`. Each row is based on an event, and an event handler in the `TransitionTable` object takes a given event, and then finds the given row.

Then, given the current state of the connection, determines the appropriate action to take and then the state to transition to next.

## 10.360.2 Constructor & Destructor Documentation

### 10.360.2.1 ULTransitionTable()

```
gdcm::network::ULTransitionTable::ULTransitionTable ( )
```

## 10.360.3 Member Function Documentation

### 10.360.3.1 HandleEvent()

```
void gdcm::network::ULTransitionTable::HandleEvent (
    Subject * s,
    ULEvent & inEvent,
    ULConnection & inConnection,
    bool & outWaitingForEvent,
    EEventID & outRaisedEvent ) const
```

### 10.360.3.2 PrintTable()

```
void gdcm::network::ULTransitionTable::PrintTable ( ) const
```

The documentation for this class was generated from the following file:

- [gdcmULTransitionTable.h](#)

## 10.361 gdcm::network::ULWritingCallback Class Reference

```
#include <gdcmULWritingCallback.h>
```

Inheritance diagram for gdcm::network::ULWritingCallback:

Collaboration diagram for gdcm::network::ULWritingCallback:

## Public Member Functions

- [ULWritingCallback](#) ()=default
- [~ULWritingCallback](#) () override=default
- void [HandleDataSet](#) (const [DataSet](#) &inDataSet) override
- void [HandleResponse](#) (const [DataSet](#) &inDataSet) override
- void [SetDirectory](#) (const std::string &inDirectoryName)

*provide the directory into which all files are written.*

## Additional Inherited Members

### 10.361.1 Constructor & Destructor Documentation

#### 10.361.1.1 ULWritingCallback()

```
gdcn::network::ULWritingCallback::ULWritingCallback ( ) [default]
```

#### 10.361.1.2 ~ULWritingCallback()

```
gdcn::network::ULWritingCallback::~~ULWritingCallback ( ) [override], [default]
```

### 10.361.2 Member Function Documentation

#### 10.361.2.1 HandleDataSet()

```
void gdcn::network::ULWritingCallback::HandleDataSet (
    const DataSet & inDataSet ) [override], [virtual]
```

Implements [gdcn::network::ULConnectionCallback](#).

#### 10.361.2.2 HandleResponse()

```
void gdcn::network::ULWritingCallback::HandleResponse (
    const DataSet & inDataSet ) [override], [virtual]
```

Implements [gdcn::network::ULConnectionCallback](#).

### 10.361.2.3 SetDirectory()

```
void gdcm::network::ULWritingCallback::SetDirectory (
    const std::string & inDirectoryName ) [inline]
```

provide the directory into which all files are written.

The documentation for this class was generated from the following file:

- [gdcmULWritingCallback.h](#)

## 10.362 gdcm::UNExplicitDataElement Class Reference

Class to read/write a [DataElement](#) as UNExplicit Data [Element](#).

```
#include <gdcmUNExplicitDataElement.h>
```

Inheritance diagram for gdcm::UNExplicitDataElement:

Collaboration diagram for gdcm::UNExplicitDataElement:

### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)

### Additional Inherited Members

#### 10.362.1 Detailed Description

Class to read/write a [DataElement](#) as UNExplicit Data [Element](#).

Note

bla

## 10.362.2 Member Function Documentation

### 10.362.2.1 GetLength()

```
VL gdcmm::UNExplicitDataElement::GetLength ( ) const
```

### 10.362.2.2 Read()

```
template<typename TSwap >  
std::istream & gdcmm::UNExplicitDataElement::Read (  
    std::istream & is )
```

### 10.362.2.3 ReadPreValue()

```
template<typename TSwap >  
std::istream & gdcmm::UNExplicitDataElement::ReadPreValue (  
    std::istream & is )
```

### 10.362.2.4 ReadValue()

```
template<typename TSwap >  
std::istream & gdcmm::UNExplicitDataElement::ReadValue (  
    std::istream & is,  
    bool readvalues = true )
```

### 10.362.2.5 ReadWithLength()

```
template<typename TSwap >  
std::istream & gdcmm::UNExplicitDataElement::ReadWithLength (  
    std::istream & is,  
    VL & length )
```

The documentation for this class was generated from the following file:

- [gdcmmUNExplicitDataElement.h](#)

## 10.363 gdcm::UNExplicitImplicitDataElement Class Reference

Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

```
#include <gdcmUNExplicitImplicitDataElement.h>
```

Inheritance diagram for gdcm::UNExplicitImplicitDataElement:

Collaboration diagram for gdcm::UNExplicitImplicitDataElement:

### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is)

### Additional Inherited Members

#### 10.363.1 Detailed Description

Class to read/write a [DataElement](#) as ExplicitImplicit Data [Element](#).

This class gather two known bugs:

1. GDCM 1.2.0 would rewrite [VR](#)=UN [Value](#) Length on 2 bytes instead of 4 bytes
2. GDCM 1.2.0 would also rewrite [DataElement](#) as Implicit when the [VR](#) would not be known this would only happen in some very rare cases. gdcm 2.X design could handle bug #1 or #2 exclusively, this class can now handle file which have both issues. See: [gdcmData/TheralysGDCM120Bug.dcm](#)

#### 10.363.2 Member Function Documentation

##### 10.363.2.1 GetLength()

```
VL gdcm::UNExplicitImplicitDataElement::GetLength ( ) const
```

### 10.363.2.2 Read()

```
template<typename TSwap >
std::istream & gdcm::UNExplicitImplicitDataElement::Read (
    std::istream & is )
```

### 10.363.2.3 ReadPreValue()

```
template<typename TSwap >
std::istream & gdcm::UNExplicitImplicitDataElement::ReadPreValue (
    std::istream & is )
```

### 10.363.2.4 ReadValue()

```
template<typename TSwap >
std::istream & gdcm::UNExplicitImplicitDataElement::ReadValue (
    std::istream & is )
```

The documentation for this class was generated from the following file:

- [gdcmUNExplicitImplicitDataElement.h](#)

## 10.364 gdcm::Unpacker12Bits Class Reference

Pack/Unpack 12 bits pixel into 16bits.

```
#include <gdcmUnpacker12Bits.h>
```

### Static Public Member Functions

- static bool [Pack](#) (char \*out, const char \*in, size\_t n)
- static bool [Unpack](#) (char \*out, const char \*in, size\_t n)



### 10.364.1 Detailed Description

Pack/Unpack 12 bits pixel into 16bits.

- You can only pack an even number of 16bits, which means a multiple of 4 (expressed in bytes)
- You can only unpack a multiple of 3 bytes

This class has no purpose in general purpose DICOM implementation. However to be able to cope with some early ACR-NEMA file generated by a well-known private vendor, one would need to unpack 12bits Stored Pixel [Value](#) into a more standard 16bits Stored Pixel [Value](#).

See also

[Rescaler](#)

### 10.364.2 Member Function Documentation

#### 10.364.2.1 Pack()

```
static bool gdcm::Unpacker12Bits::Pack (  
    char * out,  
    const char * in,  
    size_t n ) [static]
```

Pack an array of 16bits where all values are 12bits into a pack form. n is the length in bytes of array in, out will be a fake 8bits array of size  $(n / 2) * 3$

#### 10.364.2.2 Unpack()

```
static bool gdcm::Unpacker12Bits::Unpack (  
    char * out,  
    const char * in,  
    size_t n ) [static]
```

Unpack an array of 'packed' 12bits data into a more conventional 16bits array. n is the length in bytes of array in, out will be a 16bits array of size  $(n / 3) * 2$

The documentation for this class was generated from the following file:

- [gdcmUnpacker12Bits.h](#)

## 10.365 gdcm::Usage Class Reference

[Usage.](#)

```
#include <gdcmUsage.h>
```

### Public Types

- enum [UsageType](#) {  
[Mandatory](#) ,  
[Conditional](#) ,  
[UserOption](#) ,  
[Invalid](#) }

### Public Member Functions

- [Usage](#) ([UsageType](#) type=[Invalid](#))
- [operator UsageType](#) () const

### Static Public Member Functions

- static const char \* [GetUsageString](#) ([UsageType](#) type)
- static [UsageType](#) [GetUsageType](#) (const char \*type)

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [Usage](#) &vr)

## 10.365.1 Detailed Description

[Usage.](#)

#### Note

A.1.3 [IOD Module Table](#) and Functional Group [Macro Table](#) This Section of each [IOD](#) defines in a tabular form the [Modules](#) comprising the [IOD](#). The following information must be specified for each [Module](#) in the table:

- The name of the [Module](#) or Functional Group
- A reference to the Section in Annex C which defines the [Module](#) or Functional Group
- The usage of the [Module](#) or Functional Group; whether it is:
  - Mandatory (see A.1.3.1) , abbreviated M
  - Conditional (see A.1.3.2) , abbreviated C
  - User Option (see A.1.3.3) , abbreviated U The [Modules](#) referenced are defined in Annex C. A.1.3.1 MANDATORY MODULES For each [IOD](#), Mandatory [Modules](#) shall be supported per the definitions, semantics and requirements defined in Annex C.

A.1.3.2 CONDITIONAL MODULES Conditional [Modules](#) are Mandatory [Modules](#) if specific conditions are met. If the specified conditions are not met, this [Module](#) shall not be supported; that is, no information defined in that [Module](#) shall be sent. A.1.3.3 USER OPTION MODULES User Option [Modules](#) may or may not be supported. If an optional [Module](#) is supported, the [Attribute](#) Types specified in the [Modules](#) in Annex C shall be supported.

## 10.365.2 Member Enumeration Documentation

### 10.365.2.1 UsageType

```
enum gdcm::Usage::UsageType
```

Enumerator

Mandatory	
Conditional	
UserOption	
Invalid	

## 10.365.3 Constructor & Destructor Documentation

### 10.365.3.1 Usage()

```
gdcm::Usage::Usage (
    UsageType type = Invalid ) [inline]
```

## 10.365.4 Member Function Documentation

### 10.365.4.1 GetUsageString()

```
static const char * gdcm::Usage::GetUsageString (
    UsageType type ) [static]
```

### 10.365.4.2 GetUsageType()

```
static UsageType gdcm::Usage::GetUsageType (
    const char * type ) [static]
```

#### 10.365.4.3 operator UsageType()

```
gdcM::Usage::operator UsageType ( ) const [inline]
```

### 10.365.5 Friends And Related Function Documentation

#### 10.365.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const Usage & vr ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMUsage.h](#)

### 10.366 gdcM::UserEvent Class Reference

```
#include <gdcMEvent.h>
```

Inheritance diagram for gdcM::UserEvent:

Collaboration diagram for gdcM::UserEvent:

#### Additional Inherited Members

The documentation for this class was generated from the following file:

- [gdcMEvent.h](#)

### 10.367 gdcM::network::UserInformation Class Reference

[UserInformation](#).

```
#include <gdcMUserInformation.h>
```

## Public Member Functions

- [UserInformation](#) ()
- [UserInformation](#) (const [UserInformation](#) &)=delete
- [~UserInformation](#) ()
- void [AddRoleSelectionSub](#) ([RoleSelectionSub](#) const &r)
- void [AddSOPClassExtendedNegociationSub](#) ([SOPClassExtendedNegociationSub](#) const &s)
- [MaximumLengthSub](#) & [GetMaximumLengthSub](#) ()
- const [MaximumLengthSub](#) & [GetMaximumLengthSub](#) () const
- [UserInformation](#) & [operator=](#) (const [UserInformation](#) &)
- void [Print](#) (std::ostream &os) const
- std::istream & [Read](#) (std::istream &is)
- size\_t [Size](#) () const
- const std::ostream & [Write](#) (std::ostream &os) const

### 10.367.1 Detailed Description

[UserInformation](#).

[Table](#) 9-16 USER INFORMATION ITEM FIELDS

TODO what is the goal of :

[Table](#) 9-20 USER INFORMATION ITEM FIELDS

### 10.367.2 Constructor & Destructor Documentation

#### 10.367.2.1 [UserInformation\(\)](#) [1/2]

```
gdcm::network::UserInformation::UserInformation ( )
```

#### 10.367.2.2 [~UserInformation\(\)](#)

```
gdcm::network::UserInformation::~~UserInformation ( )
```

#### 10.367.2.3 [UserInformation\(\)](#) [2/2]

```
gdcm::network::UserInformation::UserInformation (
    const UserInformation & ) [delete]
```

### 10.367.3 Member Function Documentation

#### 10.367.3.1 AddRoleSelectionSub()

```
void gdcM::network::UserInformation::AddRoleSelectionSub (
    RoleSelectionSub const & r )
```

#### 10.367.3.2 AddSOPClassExtendedNegociationSub()

```
void gdcM::network::UserInformation::AddSOPClassExtendedNegociationSub (
    SOPClassExtendedNegociationSub const & s )
```

#### 10.367.3.3 GetMaximumLengthSub() [1/2]

```
MaximumLengthSub & gdcM::network::UserInformation::GetMaximumLengthSub ( ) [inline]
```

#### 10.367.3.4 GetMaximumLengthSub() [2/2]

```
const MaximumLengthSub & gdcM::network::UserInformation::GetMaximumLengthSub ( ) const [inline]
```

#### 10.367.3.5 operator=()

```
UserInformation & gdcM::network::UserInformation::operator= (
    const UserInformation & )
```

#### 10.367.3.6 Print()

```
void gdcM::network::UserInformation::Print (
    std::ostream & os ) const
```

### 10.367.3.7 Read()

```
std::istream & gdcm::network::UserInformation::Read (
    std::istream & is )
```

### 10.367.3.8 Size()

```
size_t gdcm::network::UserInformation::Size ( ) const
```

### 10.367.3.9 Write()

```
const std::ostream & gdcm::network::UserInformation::Write (
    std::ostream & os ) const
```

The documentation for this class was generated from the following file:

- [gdcmUserInformation.h](#)

## 10.368 gdcm::UUIDGenerator Class Reference

Class for generating unique UUID.

```
#include <gdcmUUIDGenerator.h>
```

### Public Member Functions

- const char \* [Generate](#) ()

### Static Public Member Functions

- static bool [IsValid](#) (const char \*uid)  
*Find out if the string is a valid UUID or not.*

### 10.368.1 Detailed Description

Class for generating unique UUID.

generate DCE 1.1 uid

## 10.368.2 Member Function Documentation

### 10.368.2.1 Generate()

```
const char * gdcM::UUIDGenerator::Generate ( )
```

Return the generated uuid NOT THREAD SAFE

### 10.368.2.2 IsValid()

```
static bool gdcM::UUIDGenerator::IsValid (
    const char * uid ) [static]
```

Find out if the string is a valid UUID or not.

The documentation for this class was generated from the following file:

- [gdcMUUIDGenerator.h](#)

## 10.369 gdcM::Validate Class Reference

[Validate](#) class.

```
#include <gdcMValidate.h>
```

Collaboration diagram for gdcM::Validate:

### Public Member Functions

- [Validate](#) ()
- [~Validate](#) ()
- const [File](#) & [GetValidatedFile](#) ()
- void [SetFile](#) ([File](#) const &f)
- void [Validation](#) ()

### Protected Attributes

- const [File](#) \* [F](#)
- [File](#) [V](#)



## 10.369.1 Detailed Description

[Validate](#) class.

## 10.369.2 Constructor & Destructor Documentation

### 10.369.2.1 Validate()

```
gdcm::Validate::Validate ( )
```

### 10.369.2.2 ~Validate()

```
gdcm::Validate::~~Validate ( )
```

## 10.369.3 Member Function Documentation

### 10.369.3.1 GetValidatedFile()

```
const File & gdcm::Validate::GetValidatedFile ( ) [inline]
```

### 10.369.3.2 SetFile()

```
void gdcm::Validate::SetFile (
    File const & f ) [inline]
```

### 10.369.3.3 Validation()

```
void gdcm::Validate::Validation ( )
```

## 10.369.4 Member Data Documentation

### 10.369.4.1 F

```
const File* gdcm::Validate::F [protected]
```

### 10.369.4.2 V

```
File gdcm::Validate::V [protected]
```

The documentation for this class was generated from the following file:

- [gdcmValidate.h](#)

## 10.370 gdcm::Value Class Reference

Class to represent the value of a Data [Element](#).

```
#include <gdcmValue.h>
```

Inheritance diagram for gdcm::Value:

Collaboration diagram for gdcm::Value:

### Public Member Functions

- [Value](#) ()=default
- [~Value](#) () override=default
- virtual void [Clear](#) ()=0
- virtual [VL GetLength](#) () const =0
- virtual bool [operator==](#) (const [Value](#) &val) const =0
- virtual void [SetLength](#) ([VL l](#))=0

### Protected Member Functions

- virtual void [SetLengthOnly](#) ([VL l](#))

## Friends

- class [DataElement](#)

## 10.370.1 Detailed Description

Class to represent the value of a Data [Element](#).

### Note

VALUE: A component of a [Value](#) Field. A [Value](#) Field may consist of one or more of these components.

## 10.370.2 Constructor & Destructor Documentation

### 10.370.2.1 Value()

```
gdcm::Value::Value ( ) [default]
```

### 10.370.2.2 ~Value()

```
gdcm::Value::~~Value ( ) [override], [default]
```

## 10.370.3 Member Function Documentation

### 10.370.3.1 Clear()

```
virtual void gdcm::Value::Clear ( ) [pure virtual]
```

Implemented in [gdcm::ByteValue](#), [gdcm::SequenceOfFragments](#), and [gdcm::SequenceOfItems](#).

### 10.370.3.2 GetLength()

```
virtual VL gdcM::Value::GetLength ( ) const [pure virtual]
```

Implemented in [gdcM::ByteValue](#), [gdcM::SequenceOfFragments](#), and [gdcM::SequenceOfItems](#).

Referenced by [gdcM::DataSet::InsertDataElement\(\)](#), and [gdcM::DataElement::SetValue\(\)](#).

### 10.370.3.3 operator==( )

```
virtual bool gdcM::Value::operator== (
    const Value & val ) const [pure virtual]
```

Implemented in [gdcM::ByteValue](#), [gdcM::SequenceOfFragments](#), and [gdcM::SequenceOfItems](#).

### 10.370.3.4 SetLength()

```
virtual void gdcM::Value::SetLength (
    VL l ) [pure virtual]
```

Implemented in [gdcM::SequenceOfFragments](#), [gdcM::SequenceOfItems](#), and [gdcM::ByteValue](#).

### 10.370.3.5 SetLengthOnly()

```
virtual void gdcM::Value::SetLengthOnly (
    VL l ) [protected], [virtual]
```

Reimplemented in [gdcM::ByteValue](#).

## 10.370.4 Friends And Related Function Documentation

### 10.370.4.1 DataElement

```
friend class DataElement [friend]
```

The documentation for this class was generated from the following file:

- [gdcMValue.h](#)

## 10.371 gdcm::ValueIO< TDE, TSwap, TType > Class Template Reference

Class to dispatch template calls.

```
#include <gdcmValueIO.h>
```

### Static Public Member Functions

- static std::istream & [Read](#) (std::istream &is, [Value](#) &v, bool readvalues)
- static const std::ostream & [Write](#) (std::ostream &os, const [Value](#) &v)

### 10.371.1 Detailed Description

```
template<typename TDE, typename TSwap, typename TType = uint8_t>  
class gdcm::ValueIO< TDE, TSwap, TType >
```

Class to dispatch template calls.

### 10.371.2 Member Function Documentation

#### 10.371.2.1 Read()

```
template<typename TDE , typename TSwap , typename TType = uint8_t>  
static std::istream & gdcm::ValueIO< TDE, TSwap, TType >::Read (  
    std::istream & is,  
    Value & v,  
    bool readvalues ) [static]
```

#### 10.371.2.2 Write()

```
template<typename TDE , typename TSwap , typename TType = uint8_t>  
static const std::ostream & gdcm::ValueIO< TDE, TSwap, TType >::Write (  
    std::ostream & os,  
    const Value & v ) [static]
```

The documentation for this class was generated from the following file:

- [gdcmValueIO.h](#)

## 10.372 gdcm::MrProtocol::Vector3 Struct Reference

```
#include <gdcmMrProtocol.h>
```

### Public Attributes

- double [dCor](#)
- double [dSag](#)
- double [dTra](#)

### 10.372.1 Member Data Documentation

#### 10.372.1.1 dCor

```
double gdcm::MrProtocol::Vector3::dCor
```

#### 10.372.1.2 dSag

```
double gdcm::MrProtocol::Vector3::dSag
```

#### 10.372.1.3 dTra

```
double gdcm::MrProtocol::Vector3::dTra
```

The documentation for this struct was generated from the following file:

- [gdcmMrProtocol.h](#)

## 10.373 gdcm::Version Class Reference

major/minor and build version

```
#include <gdcmVersion.h>
```

## Public Member Functions

- [Version](#) ()=default
- [~Version](#) ()=default
- void [Print](#) (std::ostream &os=std::cout) const

## Static Public Member Functions

- static int [GetBuildVersion](#) ()
- static int [GetMajorVersion](#) ()
- static int [GetMinorVersion](#) ()
- static const char \* [GetVersion](#) ()

## Friends

- std::ostream & [operator<<](#) (std::ostream &\_os, const [Version](#) &v)

### 10.373.1 Detailed Description

major/minor and build version

### 10.373.2 Constructor & Destructor Documentation

#### 10.373.2.1 [Version\(\)](#)

```
gdcm::Version::Version ( ) [default]
```

#### 10.373.2.2 [~Version\(\)](#)

```
gdcm::Version::~~Version ( ) [default]
```

### 10.373.3 Member Function Documentation

#### 10.373.3.1 GetBuildVersion()

```
static int gdcM::Version::GetBuildVersion ( ) [static]
```

#### 10.373.3.2 GetMajorVersion()

```
static int gdcM::Version::GetMajorVersion ( ) [static]
```

#### 10.373.3.3 GetMinorVersion()

```
static int gdcM::Version::GetMinorVersion ( ) [static]
```

#### 10.373.3.4 GetVersion()

```
static const char * gdcM::Version::GetVersion ( ) [static]
```

#### 10.373.3.5 Print()

```
void gdcM::Version::Print (
    std::ostream & os = std::cout ) const
```

### 10.373.4 Friends And Related Function Documentation

#### 10.373.4.1 operator<<

```
std::ostream & operator<< (
    std::ostream & _os,
    const Version & v ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcMVersion.h](#)



## 10.374 gdcm::VL Class Reference

Value Length.

```
#include <gdcmVL.h>
```

### Public Types

- typedef uint32\_t [Type](#)

### Public Member Functions

- [VL](#) (uint32\_t vl=0)
- [VL GetLength](#) () const
- bool [IsOdd](#) () const  
*Return whether or not the [VL](#) is odd or not.*
- bool [IsUndefined](#) () const
- [operator uint32\\_t](#) () const
- [VL & operator++](#) ()
- [VL operator++](#) (int)
- [VL & operator+=](#) ([VL](#) const &vl)  
*+= operator*
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [Read16](#) (std::istream &is)
- void [SetToUndefined](#) ()
- template<typename TSwap >  
const std::ostream & [Write](#) (std::ostream &os) const
- template<typename TSwap >  
const std::ostream & [Write16](#) (std::ostream &os) const

### Static Public Member Functions

- static uint16\_t [GetVL16Max](#) ()
- static uint32\_t [GetVL32Max](#) ()

### Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [VL](#) &vl)

### 10.374.1 Detailed Description

[Value](#) Length.

#### Warning

this is a 4bytes value ! Do not try to use it for 2bytes value length

#### Examples

[BasicImageAnonymizer.cs](#), [DecompressImage.cs](#), [ReadAndDumpDICOMDIR2.cxx](#), and [rle2img.cxx](#).

### 10.374.2 Member Typedef Documentation

#### 10.374.2.1 Type

```
typedef uint32_t gdcM::VL::Type
```

### 10.374.3 Constructor & Destructor Documentation

#### 10.374.3.1 VL()

```
gdcM::VL::VL (
    uint32_t vl = 0 ) [inline]
```

### 10.374.4 Member Function Documentation

#### 10.374.4.1 GetLength()

```
VL gdcM::VL::GetLength ( ) const [inline]
```

#### Examples

[ReadAndDumpDICOMDIR2.cxx](#).

Referenced by [gdcM::FileMetaInformation::GetFullLength\(\)](#), [gdcM::DataSet::GetLength\(\)](#), and [gdcM::Item::Write\(\)](#).

#### 10.374.4.2 GetVL16Max()

```
static uint16_t gdcm::VL::GetVL16Max ( ) [inline], [static]
```

#### 10.374.4.3 GetVL32Max()

```
static uint32_t gdcm::VL::GetVL32Max ( ) [inline], [static]
```

#### 10.374.4.4 IsOdd()

```
bool gdcm::VL::IsOdd ( ) const [inline]
```

Return whether or not the [VL](#) is odd or not.

#### 10.374.4.5 IsUndefined()

```
bool gdcm::VL::IsUndefined ( ) const [inline]
```

#### 10.374.4.6 operator uint32\_t()

```
gdcm::VL::operator uint32_t ( ) const [inline]
```

#### 10.374.4.7 operator++() [1/2]

```
VL & gdcm::VL::operator++ ( ) [inline]
```

#### 10.374.4.8 operator++() [2/2]

```
VL gdcm::VL::operator++ (
    int ) [inline]
```

#### 10.374.4.9 operator+=()

```
VL & gdcmm::VL::operator+= (
    VL const & vl ) [inline]
```

+= operator

#### 10.374.4.10 Read()

```
template<typename TSwap >
std::istream & gdcmm::VL::Read (
    std::istream & is ) [inline]
```

#### 10.374.4.11 Read16()

```
template<typename TSwap >
std::istream & gdcmm::VL::Read16 (
    std::istream & is ) [inline]
```

#### 10.374.4.12 SetToUndefined()

```
void gdcmm::VL::SetToUndefined ( ) [inline]
```

#### 10.374.4.13 Write()

```
template<typename TSwap >
const std::ostream & gdcmm::VL::Write (
    std::ostream & os ) const [inline]
```

Referenced by [gdcmm::Fragment::Write\(\)](#), [gdcmm::Item::Write\(\)](#), [gdcmm::SequenceOfFragments::Write\(\)](#), and [gdcmm::SequenceOfItems::Write\(\)](#)

#### 10.374.4.14 Write16()

```
template<typename TSwap >
const std::ostream & gdcmm::VL::Write16 (
    std::ostream & os ) const [inline]
```

## 10.374.5 Friends And Related Function Documentation

### 10.374.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const VL & vl ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmVL.h](#)

## 10.375 gdcm::VM Class Reference

**Value** Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

```
#include <gdcmVM.h>
```

### Public Types

- enum [VMType](#) {
  - [VM0](#) = 0 ,
  - [VM1](#) = 1 ,
  - [VM2](#) = 2 ,
  - [VM3](#) = 4 ,
  - [VM4](#) = 8 ,
  - [VM5](#) = 16 ,
  - [VM6](#) = 32 ,
  - [VM8](#) = 64 ,
  - [VM9](#) = 128 ,
  - [VM10](#) = 256 ,
  - [VM12](#) = 512 ,
  - [VM16](#) = 1024 ,
  - [VM18](#) = 2048 ,
  - [VM24](#) = 4096 ,
  - [VM28](#) = 8192 ,
  - [VM32](#) = 16384 ,
  - [VM35](#) = 32768 ,
  - [VM99](#) = 65536 ,
  - [VM256](#) = 131072 ,
  - [VM1\\_2](#) = VM1 | VM2 ,
  - [VM1\\_3](#) = VM1 | VM2 | VM3 ,
  - [VM1\\_4](#) = VM1 | VM2 | VM3 | VM4 ,
  - [VM1\\_5](#) = VM1 | VM2 | VM3 | VM4 | VM5 ,

```

VM1_8 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 ,
VM1_32 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 ,
VM1_99 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 ,
VM1_n = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM2_2n = VM2 | VM4 | VM6 | VM8 | VM16 | VM24 | VM32 | VM256 ,
VM2_n = VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM3_4 = VM3 | VM4 ,
VM3_3n = VM3 | VM6 | VM9 | VM24 | VM99 | VM256 ,
VM3_n = VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM4_4n = VM4 | VM16 | VM24 | VM32 | VM256 ,
VM6_6n = VM6 | VM12 | VM18 | VM24 ,
VM6_n = VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256 ,
VM7_7n ,
VM30_30n ,
VM47_47n ,
VM_END = VM1_n + 1 }

```

## Public Member Functions

- [VM](#) ([VMType](#) type=[VM0](#))
- bool [Compatible](#) ([VM](#) const &vm) const
- unsigned int [GetLength](#) () const
- [operator VMType](#) () const

## Static Public Member Functions

- static size\_t [GetNumberOfElementsFromArray](#) (const char \*array, size\_t length)
- static const char \* [GetVMString](#) ([VMType](#) vm)
- static [VMType](#) [GetVMType](#) (const char \*vm)
- static [VMType](#) [GetVMTypeFromLength](#) (size\_t length, unsigned int size)
- static bool [IsValid](#) (int vm1, [VMType](#) vm2)

## Static Protected Member Functions

- static unsigned int [GetIndex](#) ([VMType](#) vm)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [VM](#) &vm)

## 10.375.1 Detailed Description

[Value](#) Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.

Some private dict define some more: 4-4n 1-4 1-5 256 9 3-4

even more:

7-7n 10 18 12 35 47\_47n 30\_30n 28

6-6n

## 10.375.2 Member Enumeration Documentation

### 10.375.2.1 VMType

enum `gdcmm::VM::VMType`

#### Enumerator

VM0	
VM1	
VM2	
VM3	
VM4	
VM5	
VM6	
VM8	
VM9	
VM10	
VM12	
VM16	
VM18	
VM24	
VM28	
VM32	
VM35	
VM99	
VM256	
VM1_2	
VM1_3	
VM1_4	
VM1_5	
VM1_8	
VM1_32	
VM1_99	
VM1_n	
VM2_2n	
VM2_n	
VM3_4	
VM3_3n	
VM3_n	
VM4_4n	
VM6_6n	
VM6_n	
VM7_7n	
VM30_30n	
VM47_47n	
VM_END	

### 10.375.3 Constructor & Destructor Documentation

#### 10.375.3.1 VM()

```
gdcM::VM::VM (
    VMType type = VM0 ) [inline]
```

### 10.375.4 Member Function Documentation

#### 10.375.4.1 Compatible()

```
bool gdcM::VM::Compatible (
    VM const & vm ) const
```

WARNING: Implementation deficiency The Compatible function is poorly implemented, the reference vm should be coming from the dictionary, while the passed in value is the value guess from the file.

#### 10.375.4.2 GetIndex()

```
static unsigned int gdcM::VM::GetIndex (
    VMType vm ) [static], [protected]
```

#### 10.375.4.3 GetLength()

```
unsigned int gdcM::VM::GetLength ( ) const
```

#### 10.375.4.4 GetNumberOfElementsFromArray()

```
static size_t gdcM::VM::GetNumberOfElementsFromArray (
    const char * array,
    size_t length ) [static]
```



#### 10.375.4.5 GetVMString()

```
static const char * gdcm::VM::GetVMString (
    VMType vm ) [static]
```

Return the string as written in the official DICOM dict from a custom enum type

#### 10.375.4.6 GetVMType()

```
static VMType gdcm::VM::GetVMType (
    const char * vm ) [static]
```

#### 10.375.4.7 GetVMTypeFromLength()

```
static VMType gdcm::VM::GetVMTypeFromLength (
    size_t length,
    unsigned int size ) [static]
```

#### 10.375.4.8 IsValid()

```
static bool gdcm::VM::IsValid (
    int vm1,
    VMType vm2 ) [static]
```

Check if vm1 is valid compare to vm2, i.e vm1 is element of vm2 vm1 is typically deduce from counting in a ValueField

#### 10.375.4.9 operator VMType()

```
gdcm::VM::operator VMType ( ) const [inline]
```

### 10.375.5 Friends And Related Function Documentation

#### 10.375.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const VM & vm ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmVM.h](#)

## 10.376 gdcm::VMToLength< T > Struct Template Reference

The documentation for this struct was generated from the following file:

- [gdcmVM.h](#)

## 10.377 gdcm::VR Class Reference

[VR](#) class.

```
#include <gdcmVR.h>
```

### Public Types

- enum [VRType](#) : long long {  
    [INVALID](#) = 0 ,  
    [AE](#) = 1 ,  
    [AS](#) = 2 ,  
    [AT](#) = 4 ,  
    [CS](#) = 8 ,  
    [DA](#) = 16 ,  
    [DS](#) = 32 ,  
    [DT](#) = 64 ,  
    [FD](#) = 128 ,  
    [FL](#) = 256 ,  
    [IS](#) = 512 ,  
    [LO](#) = 1024 ,  
    [LT](#) = 2048 ,  
    [OB](#) = 4096 ,  
    [OD](#) = 134217728 ,  
    [OF](#) = 8192 ,  
    [OL](#) = 268435456 ,  
    [OV](#) = 2147483648 ,  
    [OW](#) = 16384 ,  
    [PN](#) = 32768 ,  
    [SH](#) = 65536 ,  
    [SL](#) = 131072 ,  
    [SQ](#) = 262144 ,  
    [SS](#) = 524288 ,  
    [ST](#) = 1048576 ,  
    [SV](#) = 4294967296 ,  
    [TM](#) = 2097152 ,  
    [UC](#) = 536870912 ,  
    [UI](#) = 4194304 ,  
    [UL](#) = 8388608 ,  
    [UN](#) = 16777216 ,  
    [UR](#) = 1073741824 ,  
    [US](#) = 33554432 ,  
    [UT](#) = 67108864 ,

```

UV = 8589934592 ,
OB_OW = OB | OW ,
US_SS = US | SS ,
US_SS_OW = US | SS | OW ,
US_OW = US | OW ,
VL16 = AE | AS | AT | CS | DA | DS | DT | FD | FL | IS | LO | LT | PN | SH | SL | SS | ST | TM | UI | UL | US ,
VL32 = OB | OW | OD | OF | OL | OV | SQ | SV | UC | UN | UR | UT | UV ,
VRASCII = AE | AS | CS | DA | DS | DT | IS | LO | LT | PN | SH | ST | TM | UC | UI | UR | UT ,
VRBINARY = AT | FL | FD | OB | OD | OF | OL | OV | OW | SL | SQ | SS | SV | UL | UN | US | UV ,
VR_VM1 = AS | LT | ST | UT | SQ | OF | OL | OV | OD | OW | OB | UN ,
VRALL = VRASCII | VRBINARY ,
VR_END = UV+1 }

```

## Public Member Functions

- [VR](#) ([VRType](#) vr=[INVALID](#))
- bool [Compatible](#) ([VR](#) const &vr) const
- int [GetLength](#) () const
- unsigned int [GetSize](#) () const
- unsigned int [GetSizeof](#) () const
- bool [IsDual](#) () const
- bool [IsVRFile](#) () const
- [operator VRType](#) () const
- std::istream & [Read](#) (std::istream &is)
- const std::ostream & [Write](#) (std::ostream &os) const

## Static Public Member Functions

- static bool [CanDisplay](#) ([VRType](#) vr)
- static uint32\_t [GetLength](#) ([VRType](#) vr)
- static const char \* [GetVRString](#) ([VRType](#) vr)
- static const char \* [GetVRStringFromFile](#) ([VRType](#) vr)
- static [VRType](#) [GetVRType](#) (const char \*vr)
- static [VRType](#) [GetVRTypeFromFile](#) (const char \*vr)
- static bool [IsASCII](#) ([VRType](#) vr)
- static bool [IsASCII2](#) ([VRType](#) vr)
- static bool [IsBinary](#) ([VRType](#) vr)
- static bool [IsBinary2](#) ([VRType](#) vr)
- static bool [IsSwap](#) (const char \*vr)
- static bool [IsValid](#) (const char \*vr)
- static bool [IsValid](#) (const char \*vr1, [VRType](#) vr2)

## Friends

- std::ostream & [operator<<](#) (std::ostream &os, const [VR](#) &vr)

### 10.377.1 Detailed Description

[VR](#) class.

This is adapted from DICOM standard The biggest difference is the INVALID [VR](#) and the composite one that differ from standard (more like an addition) This allow us to represent all the possible case express in the DICOMV3 dict

#### Note

VALUE REPRESENTATION ([VR](#)) Specifies the data type and format of the Value(s) contained in the [Value](#) Field of a Data [Element](#). VALUE REPRESENTATION FIELD: The field where the [Value](#) Representation of a Data [Element](#) is stored in the encoding of a Data [Element](#) structure with explicit [VR](#).

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), and [SimplePrint.cs](#).

### 10.377.2 Member Enumeration Documentation

#### 10.377.2.1 VRType

```
enum gdcm::VR::VRType : long long
```

##### Enumerator

INVALID	
AE	
AS	
AT	
CS	
DA	
DS	
DT	
FD	
FL	
IS	
LO	
LT	
OB	
OD	
OF	
OL	
OV	
OW	
PN	
SH	

## Enumerator

SL	
SQ	
SS	
ST	
SV	
TM	
UC	
UI	
UL	
UN	
UR	
US	
UT	
UV	
OB_OW	
US_SS	
US_SS_OW	
US_OW	
VL16	
VL32	
VRASCII	
VRBINARY	
VR_VM1	
VRALL	
VR_END	

## Examples

[Cleaner.cs](#), [NewSequence.cs](#), and [SimplePrint.cs](#).

## 10.377.3 Constructor & Destructor Documentation

### 10.377.3.1 VR()

```
gdcm::VR::VR (
    VRType vr = INVALID ) [inline]
```

## 10.377.4 Member Function Documentation

#### 10.377.4.1 CanDisplay()

```
static bool gdcm::VR::CanDisplay (
    VRType vr ) [static]
```

#### 10.377.4.2 Compatible()

```
bool gdcm::VR::Compatible (
    VR const & vr ) const
```

#### Examples

[SimplePrint.cs](#).

#### 10.377.4.3 GetLength() [1/2]

```
int gdcm::VR::GetLength ( ) const [inline]
```

References [GetLength\(\)](#).

Referenced by [GetLength\(\)](#).

#### 10.377.4.4 GetLength() [2/2]

```
static uint32_t gdcm::VR::GetLength (
    VRType vr ) [inline], [static]
```

#### 10.377.4.5 GetSize()

```
unsigned int gdcm::VR::GetSize ( ) const [inline]
```

References [AE](#), [AS](#), [AT](#), [CS](#), [DA](#), [DS](#), [DT](#), [FD](#), [FL](#), [INVALID](#), [IS](#), [LT](#), [OB](#), [OB\\_OW](#), [OD](#), [OF](#), [OL](#), [OV](#), [OW](#), [PN](#), [SH](#), [SL](#), [SQ](#), [SS](#), [ST](#), [SV](#), [TM](#), [UC](#), [UL](#), [UN](#), [UR](#), [US](#), [US\\_OW](#), [US\\_SS](#), [US\\_SS\\_OW](#), [UT](#), [UV](#), [VL16](#), [VL32](#), [VR\\_END](#), [VR\\_VM1](#), [VRALL](#), [VRASCII](#), [VRBINARY](#), and [VRTypeTemplateCase](#).

#### 10.377.4.6 GetSizeof()

```
unsigned int gdcm::VR::GetSizeof ( ) const
```

#### 10.377.4.7 GetVRString()

```
static const char * gdcm::VR::GetVRString (
    VRType vr ) [static]
```

#### 10.377.4.8 GetVRStringFromFile()

```
static const char * gdcm::VR::GetVRStringFromFile (
    VRType vr ) [static]
```

#### 10.377.4.9 GetVRType()

```
static VRType gdcm::VR::GetVRType (
    const char * vr ) [static]
```

#### 10.377.4.10 GetVRTypeFromFile()

```
static VRType gdcm::VR::GetVRTypeFromFile (
    const char * vr ) [static]
```

#### 10.377.4.11 IsASCII()

```
static bool gdcm::VR::IsASCII (
    VRType vr ) [static]
```

**10.377.4.12 IsASCII2()**

```
static bool gdcm::VR::IsASCII2 (
    VRType vr ) [static]
```

**10.377.4.13 IsBinary()**

```
static bool gdcm::VR::IsBinary (
    VRType vr ) [static]
```

**10.377.4.14 IsBinary2()**

```
static bool gdcm::VR::IsBinary2 (
    VRType vr ) [static]
```

**10.377.4.15 IsDual()**

```
bool gdcm::VR::IsDual ( ) const
```

**10.377.4.16 IsSwap()**

```
static bool gdcm::VR::IsSwap (
    const char * vr ) [static]
```

**10.377.4.17 IsValid() [1/2]**

```
static bool gdcm::VR::IsValid (
    const char * vr ) [static]
```



#### 10.377.4.18 IsValid() [2/2]

```
static bool gdcm::VR::IsValid (
    const char * vr1,
    VRType vr2 ) [static]
```

#### 10.377.4.19 IsVRFile()

```
bool gdcm::VR::IsVRFile ( ) const
```

Referenced by [gdcm::DataElement::SetVR\(\)](#).

#### 10.377.4.20 operator VRType()

```
gdcm::VR::operator VRType ( ) const [inline]
```

#### 10.377.4.21 Read()

```
std::istream & gdcm::VR::Read (
    std::istream & is ) [inline]
```

References [gdcmDebugMacro](#), [INVALID](#), and [VR\\_END](#).

#### 10.377.4.22 Write()

```
const std::ostream & gdcm::VR::Write (
    std::ostream & os ) const [inline]
```

References [gdcmAssertAlwaysMacro](#), and [INVALID](#).

### 10.377.5 Friends And Related Function Documentation

### 10.377.5.1 operator<<

```
std::ostream & operator<< (
    std::ostream & os,
    const VR & vr ) [friend]
```

The documentation for this class was generated from the following file:

- [gdcmVR.h](#)

## 10.378 gdcm::VR16ExplicitDataElement Class Reference

Class to read/write a [DataElement](#) as Explicit Data [Element](#).

```
#include <gdcmVR16ExplicitDataElement.h>
```

Inheritance diagram for gdcm::VR16ExplicitDataElement:

Collaboration diagram for gdcm::VR16ExplicitDataElement:

### Public Member Functions

- [VL GetLength](#) () const
- template<typename TSwap >  
std::istream & [Read](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadPreValue](#) (std::istream &is)
- template<typename TSwap >  
std::istream & [ReadValue](#) (std::istream &is, bool readvalues=true)
- template<typename TSwap >  
std::istream & [ReadWithLength](#) (std::istream &is, [VL](#) &length)

### Additional Inherited Members

#### 10.378.1 Detailed Description

Class to read/write a [DataElement](#) as Explicit Data [Element](#).

#### Note

This class support 16 bits when finding an unknown [VR](#): For instance: Siemens\_CT\_Sensation64\_has\_VR\_RT.↔  
dcm

## 10.378.2 Member Function Documentation

### 10.378.2.1 GetLength()

```
VL gdcm::VR16ExplicitDataElement::GetLength ( ) const
```

### 10.378.2.2 Read()

```
template<typename TSwap >  
std::istream & gdcm::VR16ExplicitDataElement::Read (   
    std::istream & is )
```

### 10.378.2.3 ReadPreValue()

```
template<typename TSwap >  
std::istream & gdcm::VR16ExplicitDataElement::ReadPreValue (   
    std::istream & is )
```

### 10.378.2.4 ReadValue()

```
template<typename TSwap >  
std::istream & gdcm::VR16ExplicitDataElement::ReadValue (   
    std::istream & is,   
    bool readvalues = true )
```

### 10.378.2.5 ReadWithLength()

```
template<typename TSwap >  
std::istream & gdcm::VR16ExplicitDataElement::ReadWithLength (   
    std::istream & is,   
    VL & length )
```

The documentation for this class was generated from the following file:

- [gdcmVR16ExplicitDataElement.h](#)

## 10.379 `gdcm::VRToEncoding< T >` Struct Template Reference

The documentation for this struct was generated from the following file:

- [gdcmVR.h](#)

## 10.380 `gdcm::VRToType< T >` Struct Template Reference

Inheritance diagram for `gdcm::VRToType< T >`:

### 10.380.1 Detailed Description

```
template<long long T>
struct gdcm::VRToType< T >
```

Examples

[DumpGEMSMovieGroup.cxx](#).

The documentation for this struct was generated from the following file:

- [gdcmVR.h](#)

## 10.381 `gdcm::VRVLSize< T >` Class Template Reference

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.382 `gdcm::VRVLSize< 0 >` Class Reference

```
#include <gdcmAttribute.h>
```

### Static Public Member Functions

- static `uint16_t` [Read](#) (`std::istream &_is`)
- static void [Write](#) (`std::ostream &os`)

## 10.382.1 Member Function Documentation

### 10.382.1.1 Read()

```
static uint16_t gdcm::VRVLSIZE< 0 >::Read (
    std::istream & _is ) [inline], [static]
```

### 10.382.1.2 Write()

```
static void gdcm::VRVLSIZE< 0 >::Write (
    std::ostream & os ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.383 gdcm::VRVLSIZE< 1 > Class Reference

```
#include <gdcmAttribute.h>
```

### Static Public Member Functions

- static uint32\_t [Read](#) (std::istream &\_is)
- static void [Write](#) (std::ostream &os)

## 10.383.1 Member Function Documentation

### 10.383.1.1 Read()

```
static uint32_t gdcm::VRVLSIZE< 1 >::Read (
    std::istream & _is ) [inline], [static]
```

### 10.383.1.2 Write()

```
static void gdcm::VRVLSize< 1 >::Write (
    std::ostream & os ) [inline], [static]
```

The documentation for this class was generated from the following file:

- [gdcmAttribute.h](#)

## 10.384 vtkGDCMImageReader Class Reference

```
#include <vtkGDCMImageReader.h>
```

Inheritance diagram for vtkGDCMImageReader:

Collaboration diagram for vtkGDCMImageReader:

### Public Member Functions

- virtual int [CanReadFile](#) (const char \*fname)
- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- vtkImageData \* [GetIconImage](#) ()
- vtkImageData \* [GetOverlay](#) (int i)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetCurve](#) (vtkPolyData \*pd)
- virtual void [SetFileNames](#) (vtkStringArray \*)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- [vtkBooleanMacro](#) ([ApplyLookupTable](#), int)
- int [vtkBooleanMacro](#) ([ApplyYBRToRGB](#), int)
- [vtkBooleanMacro](#) ([LoadIconImage](#), int)
- [vtkBooleanMacro](#) ([LoadOverlays](#), int)
- [vtkBooleanMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([ApplyLookupTable](#), int)
- [vtkGetMacro](#) ([ApplyYBRToRGB](#), int) [vtkSetMacro](#)([ApplyYBRToRGB](#)
- [vtkGetMacro](#) ([ImageFormat](#), int)
- [vtkGetMacro](#) ([LoadIconImage](#), int)
- [vtkGetMacro](#) ([LoadOverlays](#), int)
- [vtkGetMacro](#) ([LossyFlag](#), int)
- [vtkGetMacro](#) ([NumberOfIconImages](#), int)
- [vtkGetMacro](#) ([NumberOfOverlays](#), int)
- [vtkGetMacro](#) ([PlanarConfiguration](#), int)
- [vtkGetMacro](#) ([Scale](#), double)
- [vtkGetMacro](#) ([Shift](#), double)
- [vtkGetObjectMacro](#) ([Curve](#), vtkPolyData)
- [vtkGetObjectMacro](#) ([DirectionCosines](#), vtkMatrix4x4)
- [vtkGetObjectMacro](#) ([FileNames](#), vtkStringArray)
- [vtkGetObjectMacro](#) ([MedicalImageProperties](#), vtkMedicalImageProperties)
- [vtkGetVector3Macro](#) ([ImagePositionPatient](#), double)
- [vtkGetVector6Macro](#) ([ImageOrientationPatient](#), double)
- [vtkSetMacro](#) ([ApplyLookupTable](#), int)
- [vtkSetMacro](#) ([LoadIconImage](#), int)
- [vtkSetMacro](#) ([LoadOverlays](#), int)
- [vtkSetMacro](#) ([LossyFlag](#), int)
- [vtkTypeMacro](#) ([vtkGDCMImageReader](#), vtkMedicalImageReader2)

## Static Public Member Functions

- static [vtkGDCMImageReader](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMImageReader](#) ()
- [~vtkGDCMImageReader](#) ()
- void [ExecuteData](#) (vtkDataObject \*out)
- void [ExecuteInformation](#) ()
- void [FillMedicalImageInformation](#) (const [gdcm::ImageReader](#) &reader)
- int [LoadSingleFile](#) (const char \*filename, char \*pointer, unsigned long &outlen)
- int [RequestDataCompat](#) ()
- int [RequestInformationCompat](#) ()
- void [SetFilePattern](#) (const char \*)
- void [SetFilePrefix](#) (const char \*)
- [vtkGetStringMacro](#) (FilePattern)
- [vtkGetStringMacro](#) (FilePrefix)
- [vtkSetVector6Macro](#) (ImageOrientationPatient, double)

## Protected Attributes

- int [ApplyInverseVideo](#)
- int [ApplyLookupTable](#)
- int [ApplyPlanarConfiguration](#)
- int [ApplyShiftScale](#)
- int [ApplyYBRToRGB](#)
- vtkPolyData \* [Curve](#)
- vtkMatrix4x4 \* [DirectionCosines](#)
- vtkStringArray \* [FileNames](#)
- int [ForceRescale](#)
- int [IconDataScalarType](#)
- int [IconImageDataExtent](#) [6]
- int [IconNumberOfScalarComponents](#)
- int [ImageFormat](#)
- double [ImageOrientationPatient](#) [6]
- double [ImagePositionPatient](#) [3]
- int [LoadIconImage](#)
- int [LoadOverlays](#)
- int [LossyFlag](#)
- vtkMedicalImageProperties \* [MedicalImageProperties](#)
- int [NumberOfIconImages](#)
- int [NumberOfOverlays](#)
- int [PlanarConfiguration](#)
- double [Scale](#)
- double [Shift](#)

### 10.384.1 Detailed Description

#### Examples

[AWTMedical3.java](#), [Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloActiviz3.cs](#), [HelloActiviz4.cs](#), [HelloActiviz5.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [MIPViewer.java](#), [MPRViewer.java](#), [MPRViewer2.java](#), [MagnifyFile.cxx](#), [MetaImageMD5Activiz.cs](#), [ReadSeriesIntoVTK.java](#), [RefCounting.cs](#), [gdcmorthoplanes.cxx](#), [gdcmreslice.cxx](#), [gdcmtexture.cxx](#), [gdcmvolume.cxx](#), [offscreenimage.cxx](#), and [reslicesphere.cxx](#).

### 10.384.2 Constructor & Destructor Documentation

#### 10.384.2.1 `vtkGDCMImageReader()`

```
vtkGDCMImageReader::vtkGDCMImageReader ( ) [protected]
```

#### Examples

[HelloActiviz2.cs](#).

#### 10.384.2.2 `~vtkGDCMImageReader()`

```
vtkGDCMImageReader::~~vtkGDCMImageReader ( ) [protected]
```

### 10.384.3 Member Function Documentation

#### 10.384.3.1 `CanReadFile()`

```
virtual int vtkGDCMImageReader::CanReadFile (
    const char * fname ) [virtual]
```

#### Examples

[AWTMedical3.java](#), and [MetaImageMD5Activiz.cs](#).



### 10.384.3.2 ExecuteData()

```
void vtkGDCMImageReader::ExecuteData (
    vtkDataObject * out ) [protected]
```

### 10.384.3.3 ExecuteInformation()

```
void vtkGDCMImageReader::ExecuteInformation ( ) [protected]
```

### 10.384.3.4 FillMedicalImageInformation()

```
void vtkGDCMImageReader::FillMedicalImageInformation (
    const gdcml::ImageReader & reader ) [protected]
```

### 10.384.3.5 GetDescriptiveName()

```
virtual const char * vtkGDCMImageReader::GetDescriptiveName ( ) [inline], [virtual]
```

### 10.384.3.6 GetFileExtensions()

```
virtual const char * vtkGDCMImageReader::GetFileExtensions ( ) [inline], [virtual]
```

### 10.384.3.7 GetIconImage()

```
vtkImageData * vtkGDCMImageReader::GetIconImage ( )
```

### 10.384.3.8 GetOverlay()

```
vtkImageData * vtkGDCMImageReader::GetOverlay (
    int i )
```

### 10.384.3.9 LoadSingleFile()

```
int vtkGDCMImageReader::LoadSingleFile (
    const char * filename,
    char * pointer,
    unsigned long & outlen ) [protected]
```

### 10.384.3.10 New()

```
static vtkGDCMImageReader * vtkGDCMImageReader::New ( ) [static]
```

#### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz.cs](#), [HelloActiviz3.cs](#), [HelloActiviz4.cs](#), [HelloActiviz5.cs](#), [HelloVTKWorld.cs](#), [MagnifyFile.cxx](#), [MetalImageMD5Activiz.cs](#), [RefCounting.cs](#), [gdcmmorthoplanes.cxx](#), [gdcmlreslice.cxx](#), [gdcmltexture.cxx](#), [gdcmlvolume.cxx](#), [offscreenimage.cxx](#), and [reslicesphere.cxx](#).

### 10.384.3.11 PrintSelf()

```
virtual void vtkGDCMImageReader::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```

Reimplemented in [vtkGDCMThreadedImageReader](#).

### 10.384.3.12 RequestDataCompat()

```
int vtkGDCMImageReader::RequestDataCompat ( ) [protected]
```

### 10.384.3.13 RequestInformationCompat()

```
int vtkGDCMImageReader::RequestInformationCompat ( ) [protected]
```

**10.384.3.14 SetCurve()**

```
virtual void vtkGDCMImageReader::SetCurve (
    vtkPolyData * pd ) [virtual]
```

**10.384.3.15 SetFileNames()**

```
virtual void vtkGDCMImageReader::SetFileNames (
    vtkStringArray * ) [virtual]
```

**Examples**

[AWTMedical3.java](#), [HelloActiviz3.cs](#), [HelloActiviz4.cs](#), [HelloActiviz5.cs](#), [MIPViewer.java](#), [MPRViewer.java](#), [MPRViewer2.java](#), [ReadSeriesIntoVTK.java](#), and [gdcmmorthoplanes.cxx](#).

**10.384.3.16 SetFilePattern()**

```
void vtkGDCMImageReader::SetFilePattern (
    const char * ) [inline], [protected]
```

**10.384.3.17 SetFilePrefix()**

```
void vtkGDCMImageReader::SetFilePrefix (
    const char * ) [inline], [protected]
```

**10.384.3.18 SetMedicalImageProperties()**

```
virtual void vtkGDCMImageReader::SetMedicalImageProperties (
    vtkMedicalImageProperties * pd ) [virtual]
```

**10.384.3.19 vtkBooleanMacro() [1/5]**

```
vtkGDCMImageReader::vtkBooleanMacro (
    ApplyLookupTable ,
    int )
```

**10.384.3.20 vtkBooleanMacro()** [2/5]

```
int vtkGDCMImageReader::vtkBooleanMacro (
    ApplyYBRToRGB ,
    int )
```

**10.384.3.21 vtkBooleanMacro()** [3/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    LoadIconImage ,
    int )
```

**10.384.3.22 vtkBooleanMacro()** [4/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    LoadOverlays ,
    int )
```

**10.384.3.23 vtkBooleanMacro()** [5/5]

```
vtkGDCMImageReader::vtkBooleanMacro (
    LossyFlag ,
    int )
```

**10.384.3.24 vtkGetMacro()** [1/11]

```
vtkGDCMImageReader::vtkGetMacro (
    ApplyLookupTable ,
    int )
```

**10.384.3.25 vtkGetMacro()** [2/11]

```
vtkGDCMImageReader::vtkGetMacro (
    ApplyYBRToRGB ,
    int )
```

**10.384.3.26 vtkGetMacro()** [3/11]

```
vtkGDCMImageReader::vtkGetMacro (
    ImageFormat ,
    int )
```

**10.384.3.27 vtkGetMacro()** [4/11]

```
vtkGDCMImageReader::vtkGetMacro (
    LoadIconImage ,
    int )
```

**10.384.3.28 vtkGetMacro()** [5/11]

```
vtkGDCMImageReader::vtkGetMacro (
    LoadOverlays ,
    int )
```

**10.384.3.29 vtkGetMacro()** [6/11]

```
vtkGDCMImageReader::vtkGetMacro (
    LossyFlag ,
    int )
```

**10.384.3.30 vtkGetMacro()** [7/11]

```
vtkGDCMImageReader::vtkGetMacro (
    NumberOfIconImages ,
    int )
```

**10.384.3.31 vtkGetMacro()** [8/11]

```
vtkGDCMImageReader::vtkGetMacro (
    NumberOfOverlays ,
    int )
```

**10.384.3.32 vtkGetMacro()** [9/11]

```
vtkGDCMImageReader::vtkGetMacro (
    PlanarConfiguration ,
    int )
```

**10.384.3.33 vtkGetMacro()** [10/11]

```
vtkGDCMImageReader::vtkGetMacro (
    Scale ,
    double )
```

**10.384.3.34 vtkGetMacro()** [11/11]

```
vtkGDCMImageReader::vtkGetMacro (
    Shift ,
    double )
```

**10.384.3.35 vtkGetObjectMacro()** [1/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
    Curve ,
    vtkPolyData )
```

**10.384.3.36 vtkGetObjectMacro()** [2/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
    DirectionCosines ,
    vtkMatrix4x4 )
```

**10.384.3.37 vtkGetObjectMacro()** [3/4]

```
vtkGDCMImageReader::vtkGetObjectMacro (
    FileNames ,
    vtkStringArray )
```

**10.384.3.38 vtkGetObjectMacro() [4/4]**

```
vtkGDCMImageReader::vtkGetObjectMacro (
    MedicalImageProperties ,
    vtkMedicalImageProperties )
```

**10.384.3.39 vtkGetStringMacro() [1/2]**

```
vtkGDCMImageReader::vtkGetStringMacro (
    FilePattern ) [protected]
```

**10.384.3.40 vtkGetStringMacro() [2/2]**

```
vtkGDCMImageReader::vtkGetStringMacro (
    FilePrefix ) [protected]
```

**10.384.3.41 vtkGetVector3Macro()**

```
vtkGDCMImageReader::vtkGetVector3Macro (
    ImagePositionPatient ,
    double )
```

**10.384.3.42 vtkGetVector6Macro()**

```
vtkGDCMImageReader::vtkGetVector6Macro (
    ImageOrientationPatient ,
    double )
```

**10.384.3.43 vtkSetMacro() [1/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    ApplyLookupTable ,
    int )
```

**10.384.3.44 vtkSetMacro() [2/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    LoadIconImage ,
    int )
```

**10.384.3.45 vtkSetMacro() [3/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    LoadOverlays ,
    int )
```

**10.384.3.46 vtkSetMacro() [4/4]**

```
vtkGDCMImageReader::vtkSetMacro (
    LossyFlag ,
    int )
```

**10.384.3.47 vtkSetVector6Macro()**

```
vtkGDCMImageReader::vtkSetVector6Macro (
    ImageOrientationPatient ,
    double ) [protected]
```

**10.384.3.48 vtkTypeMacro()**

```
vtkGDCMImageReader::vtkTypeMacro (
    vtkGDCMImageReader ,
    vtkMedicalImageReader2 )
```

**10.384.4 Member Data Documentation**



#### 10.384.4.1 ApplyInverseVideo

```
int vtkGDCMImageReader::ApplyInverseVideo [protected]
```

#### 10.384.4.2 ApplyLookupTable

```
int vtkGDCMImageReader::ApplyLookupTable [protected]
```

#### 10.384.4.3 ApplyPlanarConfiguration

```
int vtkGDCMImageReader::ApplyPlanarConfiguration [protected]
```

#### 10.384.4.4 ApplyShiftScale

```
int vtkGDCMImageReader::ApplyShiftScale [protected]
```

#### 10.384.4.5 ApplyYBRToRGB

```
int vtkGDCMImageReader::ApplyYBRToRGB [protected]
```

#### 10.384.4.6 Curve

```
vtkPolyData* vtkGDCMImageReader::Curve [protected]
```

#### 10.384.4.7 DirectionCosines

```
vtkMatrix4x4* vtkGDCMImageReader::DirectionCosines [protected]
```

#### 10.384.4.8 FileNames

`vtkStringArray* vtkGDCMImageReader::FileNames [protected]`

#### 10.384.4.9 ForceRescale

`int vtkGDCMImageReader::ForceRescale [protected]`

#### 10.384.4.10 IconDataScalarType

`int vtkGDCMImageReader::IconDataScalarType [protected]`

#### 10.384.4.11 IconImageDataExtent

`int vtkGDCMImageReader::IconImageDataExtent[6] [protected]`

#### 10.384.4.12 IconNumberOfScalarComponents

`int vtkGDCMImageReader::IconNumberOfScalarComponents [protected]`

#### 10.384.4.13 ImageFormat

`int vtkGDCMImageReader::ImageFormat [protected]`

#### 10.384.4.14 ImageOrientationPatient

`double vtkGDCMImageReader::ImageOrientationPatient[6] [protected]`

#### 10.384.4.15 ImagePositionPatient

```
double vtkGDCMImageReader::ImagePositionPatient[3] [protected]
```

#### 10.384.4.16 LoadIconImage

```
int vtkGDCMImageReader::LoadIconImage [protected]
```

#### 10.384.4.17 LoadOverlays

```
int vtkGDCMImageReader::LoadOverlays [protected]
```

#### 10.384.4.18 LossyFlag

```
int vtkGDCMImageReader::LossyFlag [protected]
```

#### 10.384.4.19 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMImageReader::MedicalImageProperties [protected]
```

#### 10.384.4.20 NumberOfIconImages

```
int vtkGDCMImageReader::NumberOfIconImages [protected]
```

#### 10.384.4.21 NumberOfOverlays

```
int vtkGDCMImageReader::NumberOfOverlays [protected]
```

#### 10.384.4.22 PlanarConfiguration

```
int vtkGDCMImageReader::PlanarConfiguration [protected]
```

#### 10.384.4.23 Scale

```
double vtkGDCMImageReader::Scale [protected]
```

#### 10.384.4.24 Shift

```
double vtkGDCMImageReader::Shift [protected]
```

The documentation for this class was generated from the following file:

- [vtkGDCMImageReader.h](#)

### 10.385 vtkGDCMImageReader2 Class Reference

```
#include <vtkGDCMImageReader2.h>
```

Inheritance diagram for vtkGDCMImageReader2:

Collaboration diagram for vtkGDCMImageReader2:

#### Public Member Functions

- virtual int [CanReadFile](#) (const char \*fname)
- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- vtkImageData \* [GetIconImage](#) ()
- vtkAlgorithmOutput \* [GetIconImagePort](#) ()
- vtkImageData \* [GetOverlay](#) (int i)
- vtkAlgorithmOutput \* [GetOverlayPort](#) (int index)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetCurve](#) (vtkPolyData \*pd)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- [vtkBooleanMacro](#) ([ApplyLookupTable](#), int)
- int [vtkBooleanMacro](#) ([ApplyYBRToRGB](#), int)
- [vtkBooleanMacro](#) ([LoadIconImage](#), int)
- [vtkBooleanMacro](#) ([LoadOverlays](#), int)
- [vtkBooleanMacro](#) ([LossyFlag](#), int)

- [vtkGetMacro \(ApplyLookupTable, int\)](#)
- [vtkGetMacro \(ApplyYBRToRGB, int\)](#) [vtkSetMacro \(ApplyYBRToRGB](#)
- [vtkGetMacro \(ImageFormat, int\)](#)
- [vtkGetMacro \(LoadIconImage, int\)](#)
- [vtkGetMacro \(LoadOverlays, int\)](#)
- [vtkGetMacro \(LossyFlag, int\)](#)
- [vtkGetMacro \(NumberOfIconImages, int\)](#)
- [vtkGetMacro \(NumberOfOverlays, int\)](#)
- [vtkGetMacro \(PlanarConfiguration, int\)](#)
- [vtkGetMacro \(Scale, double\)](#)
- [vtkGetMacro \(Shift, double\)](#)
- [vtkGetObjectMacro \(Curve, vtkPolyData\)](#)
- [vtkGetObjectMacro \(DirectionCosines, vtkMatrix4x4\)](#)
- [vtkGetVector3Macro \(ImagePositionPatient, double\)](#)
- [vtkGetVector6Macro \(ImageOrientationPatient, double\)](#)
- [vtkSetMacro \(ApplyLookupTable, int\)](#)
- [vtkSetMacro \(LoadIconImage, int\)](#)
- [vtkSetMacro \(LoadOverlays, int\)](#)
- [vtkSetMacro \(LossyFlag, int\)](#)
- [vtkTypeMacro \(vtkGDCMImageReader2, vtkMedicalImageReader2\)](#)

## Static Public Member Functions

- static [vtkGDCMImageReader2 \\* New \(\)](#)

## Protected Member Functions

- [vtkGDCMImageReader2 \(\)](#)
- [~vtkGDCMImageReader2 \(\)](#)
- void [FillMedicalImageInformation](#) (const [gdcmm::ImageReader](#) &reader)
- int [LoadSingleFile](#) (const char \*filename, char \*pointer, unsigned long &outlen)
- int [ProcessRequest](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*output↔Vector)
- int [RequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*output↔Vector)
- int [RequestDataCompat \(\)](#)
- int [RequestInformation](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- int [RequestInformationCompat \(\)](#)
- void [SetFilePattern](#) (const char \*)
- void [SetFilePrefix](#) (const char \*)
- [vtkGetStringMacro](#) (FilePattern)
- [vtkGetStringMacro](#) (FilePrefix)
- [vtkSetVector6Macro](#) (ImageOrientationPatient, double)

## Protected Attributes

- int [ApplyInverseVideo](#)
- int [ApplyLookupTable](#)
- int [ApplyPlanarConfiguration](#)
- int [ApplyShiftScale](#)
- int [ApplyYBRToRGB](#)
- vtkPolyData \* [Curve](#)
- vtkMatrix4x4 \* [DirectionCosines](#)
- int [ForceRescale](#)
- int [IconDataScalarType](#)
- int [IconImageDataExtent](#) [6]
- int [IconNumberOfScalarComponents](#)
- int [ImageFormat](#)
- double [ImageOrientationPatient](#) [6]
- double [ImagePositionPatient](#) [3]
- int [LoadIconImage](#)
- int [LoadOverlays](#)
- int [LossyFlag](#)
- int [NumberOfIconImages](#)
- int [NumberOfOverlays](#)
- int [PlanarConfiguration](#)
- double [Scale](#)
- double [Shift](#)

### 10.385.1 Detailed Description

#### Examples

[Compute3DSpacing.cxx](#).

### 10.385.2 Constructor & Destructor Documentation

#### 10.385.2.1 vtkGDCMImageReader2()

```
vtkGDCMImageReader2::vtkGDCMImageReader2 ( ) [protected]
```

#### 10.385.2.2 ~vtkGDCMImageReader2()

```
vtkGDCMImageReader2::~~vtkGDCMImageReader2 ( ) [protected]
```

## 10.385.3 Member Function Documentation

### 10.385.3.1 CanReadFile()

```
virtual int vtkGDCMImageReader2::CanReadFile (
    const char * fname ) [virtual]
```

### 10.385.3.2 FillMedicalImageInformation()

```
void vtkGDCMImageReader2::FillMedicalImageInformation (
    const gdcm::ImageReader & reader ) [protected]
```

### 10.385.3.3 GetDescriptiveName()

```
virtual const char * vtkGDCMImageReader2::GetDescriptiveName ( ) [inline], [virtual]
```

### 10.385.3.4 GetFileExtensions()

```
virtual const char * vtkGDCMImageReader2::GetFileExtensions ( ) [inline], [virtual]
```

### 10.385.3.5 GetIconImage()

```
vtkImageData * vtkGDCMImageReader2::GetIconImage ( )
```

### 10.385.3.6 GetIconImagePort()

```
vtkAlgorithmOutput * vtkGDCMImageReader2::GetIconImagePort ( )
```

### 10.385.3.7 GetOverlay()

```
vtkImageData * vtkGDCMImageReader2::GetOverlay (
    int i )
```

### 10.385.3.8 GetOverlayPort()

```
vtkAlgorithmOutput * vtkGDCMImageReader2::GetOverlayPort (
    int index )
```

### 10.385.3.9 LoadSingleFile()

```
int vtkGDCMImageReader2::LoadSingleFile (
    const char * filename,
    char * pointer,
    unsigned long & outlen ) [protected]
```

### 10.385.3.10 New()

```
static vtkGDCMImageReader2 * vtkGDCMImageReader2::New ( ) [static]
```

#### Examples

[Compute3DSpacing.cxx](#).

### 10.385.3.11 PrintSelf()

```
virtual void vtkGDCMImageReader2::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```



**10.385.3.12 ProcessRequest()**

```
int vtkGDCMImageReader2::ProcessRequest (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector ) [protected]
```

**10.385.3.13 RequestData()**

```
int vtkGDCMImageReader2::RequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector ) [protected]
```

**10.385.3.14 RequestDataCompat()**

```
int vtkGDCMImageReader2::RequestDataCompat ( ) [protected]
```

**10.385.3.15 RequestInformation()**

```
int vtkGDCMImageReader2::RequestInformation (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector ) [protected]
```

**10.385.3.16 RequestInformationCompat()**

```
int vtkGDCMImageReader2::RequestInformationCompat ( ) [protected]
```

**10.385.3.17 SetCurve()**

```
virtual void vtkGDCMImageReader2::SetCurve (
    vtkPolyData * pd ) [virtual]
```

**10.385.3.18 SetFilePattern()**

```
void vtkGDCMImageReader2::SetFilePattern (
    const char * ) [inline], [protected]
```

**10.385.3.19 SetFilePrefix()**

```
void vtkGDCMImageReader2::SetFilePrefix (
    const char * ) [inline], [protected]
```

**10.385.3.20 SetMedicalImageProperties()**

```
virtual void vtkGDCMImageReader2::SetMedicalImageProperties (
    vtkMedicalImageProperties * pd ) [virtual]
```

**10.385.3.21 vtkBooleanMacro() [1/5]**

```
vtkGDCMImageReader2::vtkBooleanMacro (
    ApplyLookupTable ,
    int )
```

**10.385.3.22 vtkBooleanMacro() [2/5]**

```
int vtkGDCMImageReader2::vtkBooleanMacro (
    ApplyYBRTToRGB ,
    int )
```

**10.385.3.23 vtkBooleanMacro() [3/5]**

```
vtkGDCMImageReader2::vtkBooleanMacro (
    LoadIconImage ,
    int )
```

**10.385.3.24 vtkBooleanMacro()** [4/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
    LoadOverlays ,
    int )
```

**10.385.3.25 vtkBooleanMacro()** [5/5]

```
vtkGDCMImageReader2::vtkBooleanMacro (
    LossyFlag ,
    int )
```

**10.385.3.26 vtkGetMacro()** [1/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    ApplyLookupTable ,
    int )
```

**10.385.3.27 vtkGetMacro()** [2/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    ApplyYBRToRGB ,
    int )
```

**10.385.3.28 vtkGetMacro()** [3/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    ImageFormat ,
    int )
```

**10.385.3.29 vtkGetMacro()** [4/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    LoadIconImage ,
    int )
```

**10.385.3.30 vtkGetMacro()** [5/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    LoadOverlays ,
    int )
```

**10.385.3.31 vtkGetMacro()** [6/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    LossyFlag ,
    int )
```

**10.385.3.32 vtkGetMacro()** [7/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    NumberOfIconImages ,
    int )
```

**10.385.3.33 vtkGetMacro()** [8/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    NumberOfOverlays ,
    int )
```

**10.385.3.34 vtkGetMacro()** [9/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    PlanarConfiguration ,
    int )
```

**10.385.3.35 vtkGetMacro()** [10/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    Scale ,
    double )
```

**10.385.3.36 vtkGetMacro()** [11/11]

```
vtkGDCMImageReader2::vtkGetMacro (
    Shift ,
    double )
```

**10.385.3.37 vtkGetObjectMacro()** [1/2]

```
vtkGDCMImageReader2::vtkGetObjectMacro (
    Curve ,
    vtkPolyData )
```

**10.385.3.38 vtkGetObjectMacro()** [2/2]

```
vtkGDCMImageReader2::vtkGetObjectMacro (
    DirectionCosines ,
    vtkMatrix4x4 )
```

**10.385.3.39 vtkGetStringMacro()** [1/2]

```
vtkGDCMImageReader2::vtkGetStringMacro (
    FilePattern ) [protected]
```

**10.385.3.40 vtkGetStringMacro()** [2/2]

```
vtkGDCMImageReader2::vtkGetStringMacro (
    FilePrefix ) [protected]
```

**10.385.3.41 vtkGetVector3Macro()**

```
vtkGDCMImageReader2::vtkGetVector3Macro (
    ImagePositionPatient ,
    double )
```

**10.385.3.42 vtkGetVector6Macro()**

```
vtkGDCMImageReader2::vtkGetVector6Macro (
    ImageOrientationPatient ,
    double )
```

**10.385.3.43 vtkSetMacro() [1/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    ApplyLookupTable ,
    int )
```

**10.385.3.44 vtkSetMacro() [2/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    LoadIconImage ,
    int )
```

**10.385.3.45 vtkSetMacro() [3/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    LoadOverlays ,
    int )
```

**10.385.3.46 vtkSetMacro() [4/4]**

```
vtkGDCMImageReader2::vtkSetMacro (
    LossyFlag ,
    int )
```

**10.385.3.47 vtkSetVector6Macro()**

```
vtkGDCMImageReader2::vtkSetVector6Macro (
    ImageOrientationPatient ,
    double ) [protected]
```

### 10.385.3.48 vtkTypeMacro()

```
vtkGDCMImageReader2::vtkTypeMacro (
    vtkGDCMImageReader2 ,
    vtkMedicalImageReader2 )
```

## 10.385.4 Member Data Documentation

### 10.385.4.1 ApplyInverseVideo

```
int vtkGDCMImageReader2::ApplyInverseVideo [protected]
```

### 10.385.4.2 ApplyLookupTable

```
int vtkGDCMImageReader2::ApplyLookupTable [protected]
```

### 10.385.4.3 ApplyPlanarConfiguration

```
int vtkGDCMImageReader2::ApplyPlanarConfiguration [protected]
```

### 10.385.4.4 ApplyShiftScale

```
int vtkGDCMImageReader2::ApplyShiftScale [protected]
```

### 10.385.4.5 ApplyYBRToRGB

```
int vtkGDCMImageReader2::ApplyYBRToRGB [protected]
```

#### 10.385.4.6 Curve

`vtkPolyData* vtkGDCMImageReader2::Curve` [protected]

#### 10.385.4.7 DirectionCosines

`vtkMatrix4x4* vtkGDCMImageReader2::DirectionCosines` [protected]

#### 10.385.4.8 ForceRescale

`int vtkGDCMImageReader2::ForceRescale` [protected]

#### 10.385.4.9 IconDataScalarType

`int vtkGDCMImageReader2::IconDataScalarType` [protected]

#### 10.385.4.10 IconImageDataExtent

`int vtkGDCMImageReader2::IconImageDataExtent[6]` [protected]

#### 10.385.4.11 IconNumberOfScalarComponents

`int vtkGDCMImageReader2::IconNumberOfScalarComponents` [protected]

#### 10.385.4.12 ImageFormat

`int vtkGDCMImageReader2::ImageFormat` [protected]



#### 10.385.4.13 ImageOrientationPatient

```
double vtkGDCMImageReader2::ImageOrientationPatient[6] [protected]
```

#### 10.385.4.14 ImagePositionPatient

```
double vtkGDCMImageReader2::ImagePositionPatient[3] [protected]
```

#### 10.385.4.15 LoadIconImage

```
int vtkGDCMImageReader2::LoadIconImage [protected]
```

#### 10.385.4.16 LoadOverlays

```
int vtkGDCMImageReader2::LoadOverlays [protected]
```

#### 10.385.4.17 LossyFlag

```
int vtkGDCMImageReader2::LossyFlag [protected]
```

#### 10.385.4.18 NumberOfIconImages

```
int vtkGDCMImageReader2::NumberOfIconImages [protected]
```

#### 10.385.4.19 NumberOfOverlays

```
int vtkGDCMImageReader2::NumberOfOverlays [protected]
```

#### 10.385.4.20 PlanarConfiguration

```
int vtkGDCMImageReader2::PlanarConfiguration [protected]
```

#### 10.385.4.21 Scale

```
double vtkGDCMImageReader2::Scale [protected]
```

#### 10.385.4.22 Shift

```
double vtkGDCMImageReader2::Shift [protected]
```

The documentation for this class was generated from the following file:

- [vtkGDCMImageReader2.h](#)

### 10.386 vtkGDCMImageWriter Class Reference

```
#include <vtkGDCMImageWriter.h>
```

Inheritance diagram for vtkGDCMImageWriter:

Collaboration diagram for vtkGDCMImageWriter:

#### Public Types

- enum [CompressionTypes](#) {  
    [NO\\_COMPRESSION](#) = 0 ,  
    [JPEG\\_COMPRESSION](#) ,  
    [JPEG2000\\_COMPRESSION](#) ,  
    [JPEGLS\\_COMPRESSION](#) ,  
    [RLE\\_COMPRESSION](#) }

## Public Member Functions

- virtual const char \* [GetDescriptiveName](#) ()
- virtual const char \* [GetFileExtensions](#) ()
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetDirectionCosines](#) (vtkMatrix4x4 \*matrix)
- virtual void [SetDirectionCosinesFromImageOrientationPatient](#) (const double dircos[6])
- virtual void [SetFileNames](#) (vtkStringArray \*)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*)
- [vtkBooleanMacro](#) (FileLowerLeft, int)
- [vtkBooleanMacro](#) (LossyFlag, int)
- [vtkGetMacro](#) (CompressionType, int)
- [vtkGetMacro](#) (FileLowerLeft, int)
- [vtkGetMacro](#) (ImageFormat, int)
- [vtkGetMacro](#) (LossyFlag, int)
- [vtkGetMacro](#) (PlanarConfiguration, int)
- [vtkGetMacro](#) (Scale, double)
- [vtkGetMacro](#) (Shift, double)
- [vtkGetObjectMacro](#) (DirectionCosines, vtkMatrix4x4)
- [vtkGetObjectMacro](#) (FileNames, vtkStringArray)
- [vtkGetObjectMacro](#) (MedicalImageProperties, vtkMedicalImageProperties)
- [vtkGetStringMacro](#) (SeriesUID)
- [vtkGetStringMacro](#) (StudyUID)
- [vtkSetMacro](#) (CompressionType, int)
- [vtkSetMacro](#) (FileLowerLeft, int)
- [vtkSetMacro](#) (ImageFormat, int)
- [vtkSetMacro](#) (LossyFlag, int)
- [vtkSetMacro](#) (PlanarConfiguration, int)
- [vtkSetMacro](#) (Scale, double)
- [vtkSetMacro](#) (Shift, double)
- [vtkSetStringMacro](#) (SeriesUID)
- [vtkSetStringMacro](#) (StudyUID)
- [vtkTypeMacro](#) (vtkGDCMImageWriter, vtkImageWriter)
- virtual void [Write](#) ()

## Static Public Member Functions

- static [vtkGDCMImageWriter](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMImageWriter](#) ()
- [~vtkGDCMImageWriter](#) ()
- virtual char \* [GetFileName](#) ()
- int [WriteGDCMData](#) (vtkImageData \*data, int timeStep)
- void [WriteSlice](#) (vtkImageData \*data)

## 10.386.1 Detailed Description

### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [CreateFakePET.cxx](#), [CreateFakeRTDOSE.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [HelloVTKWorld2.cs](#), [MagnifyFile.cxx](#), [RefCounting.cs](#), and [gdcmorthoplanes.cxx](#).

## 10.386.2 Member Enumeration Documentation

### 10.386.2.1 CompressionTypes

```
enum vtkGDCMImageWriter::CompressionTypes
```

#### Enumerator

NO_COMPRESSION	
JPEG_COMPRESSION	
JPEG2000_COMPRESSION	
JPEGLS_COMPRESSION	
RLE_COMPRESSION	

## 10.386.3 Constructor & Destructor Documentation

### 10.386.3.1 vtkGDCMImageWriter()

```
vtkGDCMImageWriter::vtkGDCMImageWriter ( ) [protected]
```

### 10.386.3.2 ~vtkGDCMImageWriter()

```
vtkGDCMImageWriter::~~vtkGDCMImageWriter ( ) [protected]
```

## 10.386.4 Member Function Documentation

#### 10.386.4.1 GetDescriptiveName()

```
virtual const char * vtkGDCMImageWriter::GetDescriptiveName ( ) [inline], [virtual]
```

#### 10.386.4.2 GetFileExtensions()

```
virtual const char * vtkGDCMImageWriter::GetFileExtensions ( ) [inline], [virtual]
```

#### 10.386.4.3 GetFileName()

```
virtual char * vtkGDCMImageWriter::GetFileName ( ) [protected], [virtual]
```

#### 10.386.4.4 New()

```
static vtkGDCMImageWriter * vtkGDCMImageWriter::New ( ) [static]
```

##### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [CreateFakePET.cxx](#), [CreateFakeRTDOSE.cxx](#), [HelloActiviz.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld2.cs](#), [MagnifyFile.cxx](#), [RefCounting.cs](#), and [gdcmorphoplanes.cxx](#).

#### 10.386.4.5 PrintSelf()

```
virtual void vtkGDCMImageWriter::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```

#### 10.386.4.6 SetDirectionCosines()

```
virtual void vtkGDCMImageWriter::SetDirectionCosines (
    vtkMatrix4x4 * matrix ) [virtual]
```

##### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [MagnifyFile.cxx](#), and [gdcmorphoplanes.cxx](#).

#### 10.386.4.7 SetDirectionCosinesFromImageOrientationPatient()

```
virtual void vtkGDCMImageWriter::SetDirectionCosinesFromImageOrientationPatient (
    const double dircos[6] ) [virtual]
```

#### 10.386.4.8 SetFileNames()

```
virtual void vtkGDCMImageWriter::SetFileNames (
    vtkStringArray * ) [virtual]
```

##### Examples

[ConvertMultiFrameToSingleFrame.cxx](#), and [CreateFakePET.cxx](#).

#### 10.386.4.9 SetMedicalImageProperties()

```
virtual void vtkGDCMImageWriter::SetMedicalImageProperties (
    vtkMedicalImageProperties * ) [virtual]
```

##### Examples

[Convert16BitsTo8Bits.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [MagnifyFile.cxx](#), and [gdcmmorthoplanes.cxx](#).

#### 10.386.4.10 vtkBooleanMacro() [1/2]

```
vtkGDCMImageWriter::vtkBooleanMacro (
    FileLowerLeft ,
    int )
```

#### 10.386.4.11 vtkBooleanMacro() [2/2]

```
vtkGDCMImageWriter::vtkBooleanMacro (
    LossyFlag ,
    int )
```

**10.386.4.12 vtkGetMacro()** [1/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    CompressionType ,
    int )
```

**10.386.4.13 vtkGetMacro()** [2/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    FileLowerLeft ,
    int )
```

**10.386.4.14 vtkGetMacro()** [3/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    ImageFormat ,
    int )
```

**10.386.4.15 vtkGetMacro()** [4/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    LossyFlag ,
    int )
```

**10.386.4.16 vtkGetMacro()** [5/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    PlanarConfiguration ,
    int )
```

**10.386.4.17 vtkGetMacro()** [6/7]

```
vtkGDCMImageWriter::vtkGetMacro (
    Scale ,
    double )
```

**10.386.4.18 vtkGetMacro() [7/7]**

```
vtkGDCMImageWriter::vtkGetMacro (
    Shift ,
    double )
```

**10.386.4.19 vtkGetObjectMacro() [1/3]**

```
vtkGDCMImageWriter::vtkGetObjectMacro (
    DirectionCosines ,
    vtkMatrix4x4 )
```

**10.386.4.20 vtkGetObjectMacro() [2/3]**

```
vtkGDCMImageWriter::vtkGetObjectMacro (
    FileNames ,
    vtkStringArray )
```

**10.386.4.21 vtkGetObjectMacro() [3/3]**

```
vtkGDCMImageWriter::vtkGetObjectMacro (
    MedicalImageProperties ,
    vtkMedicalImageProperties )
```

**10.386.4.22 vtkGetStringMacro() [1/2]**

```
vtkGDCMImageWriter::vtkGetStringMacro (
    SeriesUID )
```

**10.386.4.23 vtkGetStringMacro() [2/2]**

```
vtkGDCMImageWriter::vtkGetStringMacro (
    StudyUID )
```



**10.386.4.24 vtkSetMacro()** [1/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    CompressionType ,
    int )
```

**10.386.4.25 vtkSetMacro()** [2/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    FileLowerLeft ,
    int )
```

**10.386.4.26 vtkSetMacro()** [3/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    ImageFormat ,
    int )
```

**10.386.4.27 vtkSetMacro()** [4/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    LossyFlag ,
    int )
```

**10.386.4.28 vtkSetMacro()** [5/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    PlanarConfiguration ,
    int )
```

**10.386.4.29 vtkSetMacro()** [6/7]

```
vtkGDCMImageWriter::vtkSetMacro (
    Scale ,
    double )
```

**10.386.4.30 vtkSetMacro() [7/7]**

```
vtkGDCMImageWriter::vtkSetMacro (
    Shift ,
    double )
```

**10.386.4.31 vtkSetStringMacro() [1/2]**

```
vtkGDCMImageWriter::vtkSetStringMacro (
    SeriesUID )
```

**10.386.4.32 vtkSetStringMacro() [2/2]**

```
vtkGDCMImageWriter::vtkSetStringMacro (
    StudyUID )
```

**10.386.4.33 vtkTypeMacro()**

```
vtkGDCMImageWriter::vtkTypeMacro (
    vtkGDCMImageWriter ,
    vtkImageWriter )
```

**10.386.4.34 Write()**

```
virtual void vtkGDCMImageWriter::Write ( ) [virtual]
```

**Examples**

[Convert16BitsTo8Bits.cxx](#), [ConvertMultiFrameToSingleFrame.cxx](#), [ConvertRGBToLuminance.cxx](#), [ConvertSingleBitTo8Bits.cxx](#), [CreateFakePET.cxx](#), [CreateFakeRTDOSE.cxx](#), [HelloActiviz.cs](#), [HelloActiviz2.cs](#), [HelloVTKWorld.cs](#), [HelloVTKWorld.java](#), [HelloVTKWorld2.cs](#), [MagnifyFile.cxx](#), and [gdcmorthoplanes.cxx](#).

**10.386.4.35 WriteGDCMData()**

```
int vtkGDCMImageWriter::WriteGDCMData (
    vtkImageData * data,
    int timeStep ) [protected]
```

**10.386.4.36 WriteSlice()**

```
void vtkGDCMImageWriter::WriteSlice (
    vtkImageData * data ) [protected]
```

The documentation for this class was generated from the following file:

- [vtkGDCMImageWriter.h](#)

**10.387 vtkGDCMMedicalImageProperties Class Reference**

```
#include <vtkGDCMMedicalImageProperties.h>
```

Inheritance diagram for vtkGDCMMedicalImageProperties:

Collaboration diagram for vtkGDCMMedicalImageProperties:

**Public Member Functions**

- virtual void [Clear](#) ()
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkGDCMMedicalImageProperties](#), vtkMedicalImageProperties)

**Static Public Member Functions**

- static [vtkGDCMMedicalImageProperties](#) \* [New](#) ()

**Protected Member Functions**

- [vtkGDCMMedicalImageProperties](#) ()
- [~vtkGDCMMedicalImageProperties](#) ()
- [gdcM::File](#) const & [GetFile](#) (unsigned int t)
- void [PushBackFile](#) ([gdcM::File](#) const &f)

## Friends

- class [vtkGDCMImageReader](#)
- class [vtkGDCMImageReader2](#)
- class [vtkGDCMImageWriter](#)

## 10.387.1 Constructor & Destructor Documentation

### 10.387.1.1 vtkGDCMMedicalImageProperties()

```
vtkGDCMMedicalImageProperties::vtkGDCMMedicalImageProperties ( ) [protected]
```

### 10.387.1.2 ~vtkGDCMMedicalImageProperties()

```
vtkGDCMMedicalImageProperties::~~vtkGDCMMedicalImageProperties ( ) [protected]
```

## 10.387.2 Member Function Documentation

### 10.387.2.1 Clear()

```
virtual void vtkGDCMMedicalImageProperties::Clear ( ) [virtual]
```

### 10.387.2.2 GetFile()

```
gdcM::File const & vtkGDCMMedicalImageProperties::GetFile (
    unsigned int t ) [protected]
```

### 10.387.2.3 New()

```
static vtkGDCMMedicalImageProperties * vtkGDCMMedicalImageProperties::New ( ) [static]
```

#### 10.387.2.4 PrintSelf()

```
void vtkGDCMMedicalImageProperties::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

#### 10.387.2.5 PushBackFile()

```
void vtkGDCMMedicalImageProperties::PushBackFile (
    gdcmm::File const & f ) [protected]
```

#### 10.387.2.6 vtkTypeMacro()

```
vtkGDCMMedicalImageProperties::vtkTypeMacro (
    vtkGDCMMedicalImageProperties ,
    vtkMedicalImageProperties )
```

### 10.387.3 Friends And Related Function Documentation

#### 10.387.3.1 vtkGDCMImageReader

```
friend class vtkGDCMImageReader [friend]
```

#### 10.387.3.2 vtkGDCMImageReader2

```
friend class vtkGDCMImageReader2 [friend]
```

#### 10.387.3.3 vtkGDCMImageWriter

```
friend class vtkGDCMImageWriter [friend]
```

The documentation for this class was generated from the following file:

- [vtkGDCMMedicalImageProperties.h](#)

## 10.388 vtkGDCMPolyDataReader Class Reference

```
#include <vtkGDCMPolyDataReader.h>
```

Inheritance diagram for vtkGDCMPolyDataReader:

Collaboration diagram for vtkGDCMPolyDataReader:

### Public Member Functions

- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkGetObjectMacro](#) ([MedicalImageProperties](#), vtkMedicalImageProperties)
- [vtkGetObjectMacro](#) ([RTStructSetProperties](#), [vtkRTStructSetProperties](#))
- [vtkGetStringMacro](#) ([FileName](#))
- [vtkSetStringMacro](#) ([FileName](#))
- [vtkTypeMacro](#) ([vtkGDCMPolyDataReader](#), vtkPolyDataAlgorithm)

### Static Public Member Functions

- static [vtkGDCMPolyDataReader](#) \* [New](#) ()

### Protected Member Functions

- [vtkGDCMPolyDataReader](#) ()
- [~vtkGDCMPolyDataReader](#) ()
- void [FillMedicalImageInformation](#) (const [gdcm::Reader](#) &reader)
- int [RequestData](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)
- int [RequestData\\_HemodynamicWaveformStorage](#) ([gdcm::Reader](#) const &reader, vtkInformationVector \*outputVector)
- int [RequestData\\_RTStructureSetStorage](#) ([gdcm::Reader](#) const &reader, vtkInformationVector \*outputVector)
- int [RequestInformation](#) (vtkInformation \*vtkNotUsed(request), vtkInformationVector \*\*vtkNotUsed(inputVector), vtkInformationVector \*outputVector)
- int [RequestInformation\\_HemodynamicWaveformStorage](#) ([gdcm::Reader](#) const &reader)
- int [RequestInformation\\_RTStructureSetStorage](#) ([gdcm::Reader](#) const &reader)

### Protected Attributes

- char \* [FileName](#)
- vtkMedicalImageProperties \* [MedicalImageProperties](#)
- [vtkRTStructSetProperties](#) \* [RTStructSetProperties](#)

### 10.388.1 Detailed Description

Examples

[GenerateRTSTRUCT.cxx](#), [gdcmscene.cxx](#), and [rtstructapp.cxx](#).

## 10.388.2 Constructor & Destructor Documentation

### 10.388.2.1 vtkGDCMPolyDataReader()

```
vtkGDCMPolyDataReader::vtkGDCMPolyDataReader ( ) [protected]
```

### 10.388.2.2 ~vtkGDCMPolyDataReader()

```
vtkGDCMPolyDataReader::~~vtkGDCMPolyDataReader ( ) [protected]
```

## 10.388.3 Member Function Documentation

### 10.388.3.1 FillMedicalImageInformation()

```
void vtkGDCMPolyDataReader::FillMedicalImageInformation (
    const gdcmm::Reader & reader ) [protected]
```

### 10.388.3.2 New()

```
static vtkGDCMPolyDataReader * vtkGDCMPolyDataReader::New ( ) [static]
```

#### Examples

[GenerateRTSTRUCT.cxx](#), [gdcmscene.cxx](#), and [rtstructapp.cxx](#).

### 10.388.3.3 PrintSelf()

```
virtual void vtkGDCMPolyDataReader::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```

#### 10.388.3.4 RequestData()

```
int vtkGDCMPolyDataReader::RequestData (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected]
```

#### 10.388.3.5 RequestData\_HemodynamicWaveformStorage()

```
int vtkGDCMPolyDataReader::RequestData_HemodynamicWaveformStorage (
    gdcM::Reader const & reader,
    vtkInformationVector * outputVector ) [protected]
```

#### 10.388.3.6 RequestData\_RTStructureSetStorage()

```
int vtkGDCMPolyDataReader::RequestData_RTStructureSetStorage (
    gdcM::Reader const & reader,
    vtkInformationVector * outputVector ) [protected]
```

#### 10.388.3.7 RequestInformation()

```
int vtkGDCMPolyDataReader::RequestInformation (
    vtkInformation * vtkNotUsedrequest,
    vtkInformationVector ** vtkNotUsedinputVector,
    vtkInformationVector * outputVector ) [protected]
```

#### 10.388.3.8 RequestInformation\_HemodynamicWaveformStorage()

```
int vtkGDCMPolyDataReader::RequestInformation_HemodynamicWaveformStorage (
    gdcM::Reader const & reader ) [protected]
```

#### 10.388.3.9 RequestInformation\_RTStructureSetStorage()

```
int vtkGDCMPolyDataReader::RequestInformation_RTStructureSetStorage (
    gdcM::Reader const & reader ) [protected]
```



**10.388.3.10 vtkGetObjectMacro() [1/2]**

```
vtkGDCMPolyDataReader::vtkGetObjectMacro (
    MedicalImageProperties ,
    vtkMedicalImageProperties )
```

**10.388.3.11 vtkGetObjectMacro() [2/2]**

```
vtkGDCMPolyDataReader::vtkGetObjectMacro (
    RTStructSetProperties ,
    vtkRTStructSetProperties )
```

**10.388.3.12 vtkGetStringMacro()**

```
vtkGDCMPolyDataReader::vtkGetStringMacro (
    FileName )
```

**10.388.3.13 vtkSetStringMacro()**

```
vtkGDCMPolyDataReader::vtkSetStringMacro (
    FileName )
```

**10.388.3.14 vtkTypeMacro()**

```
vtkGDCMPolyDataReader::vtkTypeMacro (
    vtkGDCMPolyDataReader ,
    vtkPolyDataAlgorithm )
```

**10.388.4 Member Data Documentation****10.388.4.1 FileName**

```
char* vtkGDCMPolyDataReader::FileName [protected]
```

### 10.388.4.2 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMPolyDataReader::MedicalImageProperties [protected]
```

### 10.388.4.3 RTStructSetProperties

```
vtkRTStructSetProperties* vtkGDCMPolyDataReader::RTStructSetProperties [protected]
```

The documentation for this class was generated from the following file:

- [vtkGDCMPolyDataReader.h](#)

## 10.389 vtkGDCMPolyDataWriter Class Reference

```
#include <vtkGDCMPolyDataWriter.h>
```

Inheritance diagram for vtkGDCMPolyDataWriter:

Collaboration diagram for vtkGDCMPolyDataWriter:

### Public Member Functions

- void [InitializeRTStructSet](#) (vtkStdString inDirectory, vtkStdString inStructLabel, vtkStdString inStructName, vtkStringArray \*inROINames, vtkStringArray \*inROIAlgorithmName, vtkStringArray \*inROIType)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetMedicalImageProperties](#) (vtkMedicalImageProperties \*pd)
- void [SetNumberOfInputPorts](#) (int n)
- virtual void [SetRTStructSetProperties](#) (vtkRTStructSetProperties \*pd)
- [vtkTypeMacro](#) (vtkGDCMPolyDataWriter, vtkPolyDataWriter)

### Static Public Member Functions

- static [vtkGDCMPolyDataWriter \\* New](#) ()

### Protected Member Functions

- [vtkGDCMPolyDataWriter](#) ()
- [~vtkGDCMPolyDataWriter](#) ()
- void [WriteData](#) ()
- void [WriteRTSTRUCTData](#) (gdcm::File &file, int num)
- void [WriteRTSTRUCTInfo](#) (gdcm::File &file)

## Protected Attributes

- `vtkMedicalImageProperties` \* [MedicalImageProperties](#)
- `vtkRTStructSetProperties` \* [RTStructSetProperties](#)

### 10.389.1 Detailed Description

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 10.389.2 Constructor & Destructor Documentation

#### 10.389.2.1 `vtkGDCMPolyDataWriter()`

```
vtkGDCMPolyDataWriter::vtkGDCMPolyDataWriter ( ) [protected]
```

#### 10.389.2.2 `~vtkGDCMPolyDataWriter()`

```
vtkGDCMPolyDataWriter::~~vtkGDCMPolyDataWriter ( ) [protected]
```

### 10.389.3 Member Function Documentation

#### 10.389.3.1 `InitializeRTStructSet()`

```
void vtkGDCMPolyDataWriter::InitializeRTStructSet (
    vtkStdString inDirectory,
    vtkStdString inStructLabel,
    vtkStdString inStructName,
    vtkStringArray * inROINames,
    vtkStringArray * inROIAlgorithmName,
    vtkStringArray * inROIType )
```

#### Examples

[GenerateRTSTRUCT.cxx](#).

### 10.389.3.2 New()

```
static vtkGDCMPolyDataWriter * vtkGDCMPolyDataWriter::New ( ) [static]
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 10.389.3.3 PrintSelf()

```
virtual void vtkGDCMPolyDataWriter::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```

### 10.389.3.4 SetMedicalImageProperties()

```
virtual void vtkGDCMPolyDataWriter::SetMedicalImageProperties (
    vtkMedicalImageProperties * pd ) [virtual]
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 10.389.3.5 SetNumberOfInputPorts()

```
void vtkGDCMPolyDataWriter::SetNumberOfInputPorts (
    int n )
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 10.389.3.6 SetRTStructSetProperties()

```
virtual void vtkGDCMPolyDataWriter::SetRTStructSetProperties (
    vtkRTStructSetProperties * pd ) [virtual]
```

#### Examples

[GenerateRTSTRUCT.cxx](#), and [rtstructapp.cxx](#).

### 10.389.3.7 vtkTypeMacro()

```
vtkGDCMPolyDataWriter::vtkTypeMacro (
    vtkGDCMPolyDataWriter ,
    vtkPolyDataWriter )
```

### 10.389.3.8 WriteData()

```
void vtkGDCMPolyDataWriter::WriteData ( ) [protected]
```

### 10.389.3.9 WriteRTSTRUCTData()

```
void vtkGDCMPolyDataWriter::WriteRTSTRUCTData (
    gdcM::File & file,
    int num ) [protected]
```

### 10.389.3.10 WriteRTSTRUCTInfo()

```
void vtkGDCMPolyDataWriter::WriteRTSTRUCTInfo (
    gdcM::File & file ) [protected]
```

## 10.389.4 Member Data Documentation

### 10.389.4.1 MedicalImageProperties

```
vtkMedicalImageProperties* vtkGDCMPolyDataWriter::MedicalImageProperties [protected]
```

### 10.389.4.2 RTStructSetProperties

```
vtkRTStructSetProperties* vtkGDCMPolyDataWriter::RTStructSetProperties [protected]
```

The documentation for this class was generated from the following file:

- [vtkGDCMPolyDataWriter.h](#)

## 10.390 vtkGDCMTesting Class Reference

```
#include <vtkGDCMTesting.h>
```

Inheritance diagram for vtkGDCMTesting:

Collaboration diagram for vtkGDCMTesting:

### Public Types

- typedef const char \*const (\* [MD5MetalImagesType](#))[3]

### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkGDCMTesting](#), vtkObject)

### Static Public Member Functions

- static const char \* [GetGDCMDataRoot](#) ()
- static const char \*const \* [GetMD5MetalImage](#) (unsigned int file)
- static const char \* [GetMHDMD5FromFile](#) (const char \*filepath)
- static unsigned int [GetNumberOfMD5MetalImages](#) ()
- static const char \* [GetRAWMD5FromFile](#) (const char \*filepath)
- static const char \* [GetVTKDataRoot](#) ()
- static [vtkGDCMTesting](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMTesting \(\)](#)
- [~vtkGDCMTesting \(\)](#)

### 10.390.1 Detailed Description

#### Examples

[HelloActiviz5.cs](#), [HelloVTKWorld2.cs](#), [MetaImageMD5Activiz.cs](#), [ReadSeriesIntoVTK.java](#), and [RefCounting.cs](#).

### 10.390.2 Member Typedef Documentation

#### 10.390.2.1 MD5MetaImagesType

```
typedef const char* const(* vtkGDCMTesting::MD5MetaImagesType) [3]
```

### 10.390.3 Constructor & Destructor Documentation

#### 10.390.3.1 vtkGDCMTesting()

```
vtkGDCMTesting::vtkGDCMTesting ( ) [protected]
```

#### 10.390.3.2 ~vtkGDCMTesting()

```
vtkGDCMTesting::~~vtkGDCMTesting ( ) [protected]
```

### 10.390.4 Member Function Documentation

#### 10.390.4.1 GetGDCMDataRoot()

```
static const char * vtkGDCMTesting::GetGDCMDataRoot ( ) [static]
```

##### Examples

[HelloActiviz5.cs](#), and [ReadSeriesIntoVTK.java](#).

#### 10.390.4.2 GetMD5MetaImage()

```
static const char *const * vtkGDCMTesting::GetMD5MetaImage (
    unsigned int file ) [static]
```

#### 10.390.4.3 GetMHDMD5FromFile()

```
static const char * vtkGDCMTesting::GetMHDMD5FromFile (
    const char * filepath ) [static]
```

##### Examples

[MetaImageMD5Activiz.cs](#).

#### 10.390.4.4 GetNumberOfMD5MetaImages()

```
static unsigned int vtkGDCMTesting::GetNumberOfMD5MetaImages ( ) [static]
```

#### 10.390.4.5 GetRAWMD5FromFile()

```
static const char * vtkGDCMTesting::GetRAWMD5FromFile (
    const char * filepath ) [static]
```

##### Examples

[MetaImageMD5Activiz.cs](#).



#### 10.390.4.6 GetVTKDataRoot()

```
static const char * vtkGDCMTesting::GetVTKDataRoot ( ) [static]
```

##### Examples

[HelloActiviz5.cs](#), and [HelloVTKWorld2.cs](#).

#### 10.390.4.7 New()

```
static vtkGDCMTesting * vtkGDCMTesting::New ( ) [static]
```

##### Examples

[RefCounting.cs](#).

#### 10.390.4.8 PrintSelf()

```
void vtkGDCMTesting::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

#### 10.390.4.9 vtkTypeMacro()

```
vtkGDCMTesting::vtkTypeMacro (
    vtkGDCMTesting ,
    vtkObject )
```

The documentation for this class was generated from the following file:

- [vtkGDCMTesting.h](#)

## 10.391 vtkGDCMThreadedImageReader Class Reference

```
#include <vtkGDCMThreadedImageReader.h>
```

Inheritance diagram for vtkGDCMThreadedImageReader:

Collaboration diagram for vtkGDCMThreadedImageReader:

## Public Member Functions

- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkBooleanMacro](#) (UseShiftScale, int)
- [vtkGetMacro](#) (UseShiftScale, int)
- [vtkSetMacro](#) (Scale, double)
- [vtkSetMacro](#) (Shift, double)
- [vtkSetMacro](#) (UseShiftScale, int)
- [vtkTypeMacro](#) (vtkGDCMThreadedImageReader, vtkGDCMImageReader)

## Static Public Member Functions

- static [vtkGDCMThreadedImageReader](#) \* [New](#) ()

## Protected Member Functions

- [vtkGDCMThreadedImageReader](#) ()
- [~vtkGDCMThreadedImageReader](#) ()
- void [ExecuteData](#) (vtkDataObject \*out)
- void [ExecuteInformation](#) ()
- void [ReadFiles](#) (unsigned int nfiles, const char \*filenames[])
- void [RequestDataCompat](#) ()

## Additional Inherited Members

### 10.391.1 Constructor & Destructor Documentation

#### 10.391.1.1 [vtkGDCMThreadedImageReader\(\)](#)

```
vtkGDCMThreadedImageReader::vtkGDCMThreadedImageReader ( ) [protected]
```

#### 10.391.1.2 [~vtkGDCMThreadedImageReader\(\)](#)

```
vtkGDCMThreadedImageReader::~~vtkGDCMThreadedImageReader ( ) [protected]
```

### 10.391.2 Member Function Documentation

### 10.391.2.1 ExecuteData()

```
void vtkGDCMThreadedImageReader::ExecuteData (
    vtkDataObject * out ) [protected]
```

### 10.391.2.2 ExecuteInformation()

```
void vtkGDCMThreadedImageReader::ExecuteInformation ( ) [protected]
```

### 10.391.2.3 New()

```
static vtkGDCMThreadedImageReader * vtkGDCMThreadedImageReader::New ( ) [static]
```

### 10.391.2.4 PrintSelf()

```
virtual void vtkGDCMThreadedImageReader::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```

Reimplemented from [vtkGDCMImageReader](#).

### 10.391.2.5 ReadFiles()

```
void vtkGDCMThreadedImageReader::ReadFiles (
    unsigned int nfiles,
    const char * filenames[ ] ) [protected]
```

### 10.391.2.6 RequestDataCompat()

```
void vtkGDCMThreadedImageReader::RequestDataCompat ( ) [protected]
```

**10.391.2.7 vtkBooleanMacro()**

```
vtkGDCMThreadedImageReader::vtkBooleanMacro (
    UseShiftScale ,
    int )
```

**10.391.2.8 vtkGetMacro()**

```
vtkGDCMThreadedImageReader::vtkGetMacro (
    UseShiftScale ,
    int )
```

**10.391.2.9 vtkSetMacro() [1/3]**

```
vtkGDCMThreadedImageReader::vtkSetMacro (
    Scale ,
    double )
```

**10.391.2.10 vtkSetMacro() [2/3]**

```
vtkGDCMThreadedImageReader::vtkSetMacro (
    Shift ,
    double )
```

**10.391.2.11 vtkSetMacro() [3/3]**

```
vtkGDCMThreadedImageReader::vtkSetMacro (
    UseShiftScale ,
    int )
```

**10.391.2.12 vtkTypeMacro()**

```
vtkGDCMThreadedImageReader::vtkTypeMacro (
    vtkGDCMThreadedImageReader ,
    vtkGDCMImageReader )
```

The documentation for this class was generated from the following file:

- [vtkGDCMThreadedImageReader.h](#)

## 10.392 vtkGDCMThreadedImageReader2 Class Reference

```
#include <vtkGDCMThreadedImageReader2.h>
```

Inheritance diagram for vtkGDCMThreadedImageReader2:

Collaboration diagram for vtkGDCMThreadedImageReader2:

### Public Member Functions

- virtual const char \* [GetFileName](#) (int i=0)
- virtual void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetFileName](#) (const char \*filename)
- virtual void [SetFileNames](#) (vtkStringArray \*)
- int [SplitExtent](#) (int splitExt[6], int startExt[6], int num, int total)
- [vtkBooleanMacro](#) (FileLowerLeft, int)
- [vtkBooleanMacro](#) (LoadOverlays, int)
- [vtkBooleanMacro](#) (UseShiftScale, int)
- [vtkGetMacro](#) (DataScalarType, int)
- [vtkGetMacro](#) (FileLowerLeft, int)
- [vtkGetMacro](#) (LoadOverlays, int)
- [vtkGetMacro](#) (NumberOfOverlays, int)
- [vtkGetMacro](#) (NumberOfScalarComponents, int)
- [vtkGetMacro](#) (Scale, double)
- [vtkGetMacro](#) (Shift, double)
- [vtkGetMacro](#) (UseShiftScale, int)
- [vtkGetObjectMacro](#) (FileNames, vtkStringArray)
- [vtkGetVector3Macro](#) (DataOrigin, double)
- [vtkGetVector3Macro](#) (DataSpacing, double)
- [vtkGetVector6Macro](#) (DataExtent, int)
- [vtkSetMacro](#) (DataScalarType, int)
- [vtkSetMacro](#) (FileLowerLeft, int)
- [vtkSetMacro](#) (LoadOverlays, int)
- [vtkSetMacro](#) (NumberOfScalarComponents, int)
- [vtkSetMacro](#) (Scale, double)
- [vtkSetMacro](#) (Shift, double)
- [vtkSetMacro](#) (UseShiftScale, int)
- [vtkSetVector3Macro](#) (DataOrigin, double)
- [vtkSetVector3Macro](#) (DataSpacing, double)
- [vtkSetVector6Macro](#) (DataExtent, int)
- [vtkTypeMacro](#) (vtkGDCMThreadedImageReader2, vtkThreadedImageAlgorithm)

### Static Public Member Functions

- static [vtkGDCMThreadedImageReader2 \\* New](#) ()

## Protected Member Functions

- [vtkGDCMThreadedImageReader2](#) ()
- [~vtkGDCMThreadedImageReader2](#) ()
- int [RequestInformation](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- void [ThreadedRequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector, vtkImageData \*\*\*inData, vtkImageData \*\*outData, int outExt[6], int id)

## 10.392.1 Constructor & Destructor Documentation

### 10.392.1.1 vtkGDCMThreadedImageReader2()

```
vtkGDCMThreadedImageReader2::vtkGDCMThreadedImageReader2 ( ) [protected]
```

### 10.392.1.2 ~vtkGDCMThreadedImageReader2()

```
vtkGDCMThreadedImageReader2::~vtkGDCMThreadedImageReader2 ( ) [protected]
```

## 10.392.2 Member Function Documentation

### 10.392.2.1 GetFileName()

```
virtual const char * vtkGDCMThreadedImageReader2::GetFileName (
    int i = 0 ) [virtual]
```

### 10.392.2.2 New()

```
static vtkGDCMThreadedImageReader2 * vtkGDCMThreadedImageReader2::New ( ) [static]
```

### 10.392.2.3 PrintSelf()

```
virtual void vtkGDCMThreadedImageReader2::PrintSelf (
    ostream & os,
    vtkIndent indent ) [virtual]
```

### 10.392.2.4 RequestInformation()

```
int vtkGDCMThreadedImageReader2::RequestInformation (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector ) [protected]
```

### 10.392.2.5 SetFileName()

```
virtual void vtkGDCMThreadedImageReader2::SetFileName (
    const char * filename ) [virtual]
```

### 10.392.2.6 SetFileNames()

```
virtual void vtkGDCMThreadedImageReader2::SetFileNames (
    vtkStringArray * ) [virtual]
```

### 10.392.2.7 SplitExtent()

```
int vtkGDCMThreadedImageReader2::SplitExtent (
    int splitExt[6],
    int startExt[6],
    int num,
    int total )
```

**10.392.2.8 ThreadedRequestData()**

```
void vtkGDCMThreadedImageReader2::ThreadedRequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector,
    vtkImageData *** inData,
    vtkImageData ** outData,
    int outExt[6],
    int id ) [protected]
```

**10.392.2.9 vtkBooleanMacro()** [1/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
    FileLowerLeft ,
    int )
```

**10.392.2.10 vtkBooleanMacro()** [2/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
    LoadOverlays ,
    int )
```

**10.392.2.11 vtkBooleanMacro()** [3/3]

```
vtkGDCMThreadedImageReader2::vtkBooleanMacro (
    UseShiftScale ,
    int )
```

**10.392.2.12 vtkGetMacro()** [1/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    DataScalarType ,
    int )
```



**10.392.2.13 vtkGetMacro()** [2/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    FileLowerLeft ,
    int )
```

**10.392.2.14 vtkGetMacro()** [3/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    LoadOverlays ,
    int )
```

**10.392.2.15 vtkGetMacro()** [4/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    NumberOfOverlays ,
    int )
```

**10.392.2.16 vtkGetMacro()** [5/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    NumberOfScalarComponents ,
    int )
```

**10.392.2.17 vtkGetMacro()** [6/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    Scale ,
    double )
```

**10.392.2.18 vtkGetMacro()** [7/8]

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    Shift ,
    double )
```

**10.392.2.19 vtkGetMacro() [8/8]**

```
vtkGDCMThreadedImageReader2::vtkGetMacro (
    UseShiftScale ,
    int )
```

**10.392.2.20 vtkGetObjectMacro()**

```
vtkGDCMThreadedImageReader2::vtkGetObjectMacro (
    FileNames ,
    vtkStringArray )
```

**10.392.2.21 vtkGetVector3Macro() [1/2]**

```
vtkGDCMThreadedImageReader2::vtkGetVector3Macro (
    DataOrigin ,
    double )
```

**10.392.2.22 vtkGetVector3Macro() [2/2]**

```
vtkGDCMThreadedImageReader2::vtkGetVector3Macro (
    DataSpacing ,
    double )
```

**10.392.2.23 vtkGetVector6Macro()**

```
vtkGDCMThreadedImageReader2::vtkGetVector6Macro (
    DataExtent ,
    int )
```

**10.392.2.24 vtkSetMacro() [1/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    DataScalarType ,
    int )
```

**10.392.2.25 vtkSetMacro() [2/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    FileLowerLeft ,
    int )
```

**10.392.2.26 vtkSetMacro() [3/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    LoadOverlays ,
    int )
```

**10.392.2.27 vtkSetMacro() [4/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    NumberOfScalarComponents ,
    int )
```

**10.392.2.28 vtkSetMacro() [5/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    Scale ,
    double )
```

**10.392.2.29 vtkSetMacro() [6/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    Shift ,
    double )
```

**10.392.2.30 vtkSetMacro() [7/7]**

```
vtkGDCMThreadedImageReader2::vtkSetMacro (
    UseShiftScale ,
    int )
```

**10.392.2.31 vtkSetVector3Macro()** [1/2]

```
vtkGDCMThreadedImageReader2::vtkSetVector3Macro (
    DataOrigin ,
    double )
```

**10.392.2.32 vtkSetVector3Macro()** [2/2]

```
vtkGDCMThreadedImageReader2::vtkSetVector3Macro (
    DataSpacing ,
    double )
```

**10.392.2.33 vtkSetVector6Macro()**

```
vtkGDCMThreadedImageReader2::vtkSetVector6Macro (
    DataExtent ,
    int )
```

**10.392.2.34 vtkTypeMacro()**

```
vtkGDCMThreadedImageReader2::vtkTypeMacro (
    vtkGDCMThreadedImageReader2 ,
    vtkThreadedImageAlgorithm )
```

The documentation for this class was generated from the following file:

- [vtkGDCMThreadedImageReader2.h](#)

**10.393 vtkImageColorViewer Class Reference**

```
#include <vtkImageColorViewer.h>
```

Inheritance diagram for vtkImageColorViewer:

Collaboration diagram for vtkImageColorViewer:

## Public Types

- enum {  
[SLICE\\_ORIENTATION\\_YZ](#) = 0 ,  
[SLICE\\_ORIENTATION\\_XZ](#) = 1 ,  
[SLICE\\_ORIENTATION\\_XY](#) = 2 }

## Public Member Functions

- virtual void [AddInput](#) (vtkImageData \*input)
- virtual void [AddInputConnection](#) (vtkAlgorithmOutput \*input)
- virtual double [GetColorLevel](#) ()
- virtual double [GetColorWindow](#) ()
- virtual vtkImageData \* [GetInput](#) ()
- virtual int [GetOffScreenRendering](#) ()
- double [GetOverlayVisibility](#) ()
- virtual int \* [GetPosition](#) ()
- virtual int \* [GetSize](#) ()
- virtual int [GetSliceMax](#) ()
- virtual int [GetSliceMin](#) ()
- virtual int \* [GetSliceRange](#) ()
- virtual void [GetSliceRange](#) (int &min, int &max)
- virtual void [GetSliceRange](#) (int range[2])
- virtual const char \* [GetWindowName](#) ()
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [Render](#) (void)
- virtual void [SetColorLevel](#) (double s)
- virtual void [SetColorWindow](#) (double s)
- virtual void [SetDisplayId](#) (void \*a)
- virtual void [SetInput](#) (vtkImageData \*in)
- virtual void [SetInputConnection](#) (vtkAlgorithmOutput \*input)
- virtual void [SetOffScreenRendering](#) (int)
- void [SetOverlayVisibility](#) (double vis)
- virtual void [SetParentId](#) (void \*a)
- virtual void [SetPosition](#) (int a, int b)
- virtual void [SetPosition](#) (int a[2])
- virtual void [SetRenderer](#) (vtkRenderer \*arg)
- virtual void [SetRenderWindow](#) (vtkRenderWindow \*arg)
- virtual void [SetSize](#) (int a, int b)
- virtual void [SetSize](#) (int a[2])
- virtual void [SetSlice](#) (int s)
- virtual void [SetSliceOrientation](#) (int orientation)
- virtual void [SetSliceOrientationToXY](#) ()
- virtual void [SetSliceOrientationToXZ](#) ()
- virtual void [SetSliceOrientationToYZ](#) ()
- virtual void [SetupInteractor](#) (vtkRenderWindowInteractor \*)
- virtual void [SetWindowId](#) (void \*a)
- virtual void [UpdateDisplayExtent](#) ()
- [VTK\\_LEGACY](#) (int GetWholeZMax())
- [VTK\\_LEGACY](#) (int GetWholeZMin())

- [VTK\\_LEGACY](#) (int GetZSlice())
- [VTK\\_LEGACY](#) (void SetZSlice(int))
- [vtkBooleanMacro](#) (OffScreenRendering, int)
- [vtkGetMacro](#) (Slice, int)
- [vtkGetMacro](#) (SliceOrientation, int)
- [vtkGetObjectMacro](#) (ImageActor, vtkImageActor)
- [vtkGetObjectMacro](#) (InteractorStyle, vtkInteractorStyleImage)
- [vtkGetObjectMacro](#) (Renderer, vtkRenderer)
- [vtkGetObjectMacro](#) (RenderWindow, vtkRenderWindow)
- [vtkGetObjectMacro](#) (WindowLevel, vtkImageMapToWindowLevelColors2)
- [vtkTypeMacro](#) (vtkImageColorViewer, vtkObject)

## Static Public Member Functions

- static [vtkImageColorViewer \\* New](#) ()

## Protected Member Functions

- [vtkImageColorViewer](#) ()
- [~vtkImageColorViewer](#) ()
- virtual void [InstallPipeline](#) ()
- virtual void [UnInstallPipeline](#) ()
- virtual void [UpdateOrientation](#) ()

## Protected Attributes

- int [FirstRender](#)
- vtkImageActor \* [ImageActor](#)
- vtkRenderWindowInteractor \* [Interactor](#)
- vtkInteractorStyleImage \* [InteractorStyle](#)
- vtkImageActor \* [OverlayImageActor](#)
- vtkRenderer \* [Renderer](#)
- vtkRenderWindow \* [RenderWindow](#)
- int [Slice](#)
- int [SliceOrientation](#)
- [vtkImageMapToWindowLevelColors2](#) \* [WindowLevel](#)

## Friends

- class [vtkImageColorViewerCallback](#)

## 10.393.1 Detailed Description

### Examples

[gdcmrtonplan.cxx](#), and [gdcmrplan.cxx](#).

## 10.393.2 Member Enumeration Documentation

### 10.393.2.1 anonymous enum

anonymous enum

Enumerator

SLICE_ORIENTATION_YZ	
SLICE_ORIENTATION_XZ	
SLICE_ORIENTATION_XY	

## 10.393.3 Constructor & Destructor Documentation

### 10.393.3.1 vtkImageColorViewer()

```
vtkImageColorViewer::vtkImageColorViewer ( ) [protected]
```

### 10.393.3.2 ~vtkImageColorViewer()

```
vtkImageColorViewer::~~vtkImageColorViewer ( ) [protected]
```

## 10.393.4 Member Function Documentation

### 10.393.4.1 AddInput()

```
virtual void vtkImageColorViewer::AddInput (
    vtkImageData * input ) [virtual]
```

**10.393.4.2 AddInputConnection()**

```
virtual void vtkImageColorViewer::AddInputConnection (
    vtkAlgorithmOutput * input ) [virtual]
```

**10.393.4.3 GetColorLevel()**

```
virtual double vtkImageColorViewer::GetColorLevel ( ) [virtual]
```

**10.393.4.4 GetColorWindow()**

```
virtual double vtkImageColorViewer::GetColorWindow ( ) [virtual]
```

**10.393.4.5 GetInput()**

```
virtual vtkImageData * vtkImageColorViewer::GetInput ( ) [virtual]
```

**10.393.4.6 GetOffScreenRendering()**

```
virtual int vtkImageColorViewer::GetOffScreenRendering ( ) [virtual]
```

**10.393.4.7 GetOverlayVisibility()**

```
double vtkImageColorViewer::GetOverlayVisibility ( )
```

**10.393.4.8 GetPosition()**

```
virtual int * vtkImageColorViewer::GetPosition ( ) [virtual]
```



**10.393.4.9 GetSize()**

```
virtual int * vtkImageColorViewer::GetSize ( ) [virtual]
```

**10.393.4.10 GetSliceMax()**

```
virtual int vtkImageColorViewer::GetSliceMax ( ) [virtual]
```

**10.393.4.11 GetSliceMin()**

```
virtual int vtkImageColorViewer::GetSliceMin ( ) [virtual]
```

**10.393.4.12 GetSliceRange() [1/3]**

```
virtual int * vtkImageColorViewer::GetSliceRange ( ) [virtual]
```

**10.393.4.13 GetSliceRange() [2/3]**

```
virtual void vtkImageColorViewer::GetSliceRange (
    int & min,
    int & max ) [virtual]
```

**10.393.4.14 GetSliceRange() [3/3]**

```
virtual void vtkImageColorViewer::GetSliceRange (
    int range[2] ) [inline], [virtual]
```

**10.393.4.15 GetWindowName()**

```
virtual const char * vtkImageColorViewer::GetWindowName ( ) [virtual]
```

#### 10.393.4.16 InstallPipeline()

```
virtual void vtkImageColorViewer::InstallPipeline ( ) [protected], [virtual]
```

#### 10.393.4.17 New()

```
static vtkImageColorViewer * vtkImageColorViewer::New ( ) [static]
```

##### Examples

[gdcmrptionplan.cxx](#), and [gdcmrtpplan.cxx](#).

#### 10.393.4.18 PrintSelf()

```
void vtkImageColorViewer::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

#### 10.393.4.19 Render()

```
virtual void vtkImageColorViewer::Render (
    void ) [virtual]
```

##### Examples

[gdcmrptionplan.cxx](#), and [gdcmrtpplan.cxx](#).

#### 10.393.4.20 SetColorLevel()

```
virtual void vtkImageColorViewer::SetColorLevel (
    double s ) [virtual]
```

**10.393.4.21 SetColorWindow()**

```
virtual void vtkImageColorViewer::SetColorWindow (
    double s ) [virtual]
```

**10.393.4.22 SetDisplayId()**

```
virtual void vtkImageColorViewer::SetDisplayId (
    void * a ) [virtual]
```

**10.393.4.23 SetInput()**

```
virtual void vtkImageColorViewer::SetInput (
    vtkImageData * in ) [virtual]
```

**Examples**

[gdcmrptionplan.cxx](#), and [gdcmrtpplan.cxx](#).

**10.393.4.24 SetInputConnection()**

```
virtual void vtkImageColorViewer::SetInputConnection (
    vtkAlgorithmOutput * input ) [virtual]
```

**10.393.4.25 SetOffScreenRendering()**

```
virtual void vtkImageColorViewer::SetOffScreenRendering (
    int ) [virtual]
```

**10.393.4.26 SetOverlayVisibility()**

```
void vtkImageColorViewer::SetOverlayVisibility (
    double vis )
```

**10.393.4.27 SetParentId()**

```
virtual void vtkImageColorViewer::SetParentId (  
    void * a ) [virtual]
```

**10.393.4.28 SetPosition() [1/2]**

```
virtual void vtkImageColorViewer::SetPosition (  
    int a,  
    int b ) [virtual]
```

**10.393.4.29 SetPosition() [2/2]**

```
virtual void vtkImageColorViewer::SetPosition (  
    int a[2] ) [inline], [virtual]
```

References [SetPosition\(\)](#).

Referenced by [SetPosition\(\)](#).

**10.393.4.30 SetRenderer()**

```
virtual void vtkImageColorViewer::SetRenderer (  
    vtkRenderer * arg ) [virtual]
```

**10.393.4.31 SetRenderWindow()**

```
virtual void vtkImageColorViewer::SetRenderWindow (  
    vtkRenderWindow * arg ) [virtual]
```

**10.393.4.32 SetSize() [1/2]**

```
virtual void vtkImageColorViewer::SetSize (
    int a,
    int b ) [virtual]
```

**Examples**

[gdcmrtionplan.cxx](#), and [gdcmrtplan.cxx](#).

**10.393.4.33 SetSize() [2/2]**

```
virtual void vtkImageColorViewer::SetSize (
    int a[2] ) [inline], [virtual]
```

References [SetSize\(\)](#).

Referenced by [SetSize\(\)](#).

**10.393.4.34 SetSlice()**

```
virtual void vtkImageColorViewer::SetSlice (
    int s ) [virtual]
```

**10.393.4.35 SetSliceOrientation()**

```
virtual void vtkImageColorViewer::SetSliceOrientation (
    int orientation ) [virtual]
```

**10.393.4.36 SetSliceOrientationToXY()**

```
virtual void vtkImageColorViewer::SetSliceOrientationToXY ( ) [inline], [virtual]
```

References [SLICE\\_ORIENTATION\\_XY](#).

**10.393.4.37 SetSliceOrientationToXZ()**

```
virtual void vtkImageColorViewer::SetSliceOrientationToXZ ( ) [inline], [virtual]
```

References [SLICE\\_ORIENTATION\\_XZ](#).

**10.393.4.38 SetSliceOrientationToYZ()**

```
virtual void vtkImageColorViewer::SetSliceOrientationToYZ ( ) [inline], [virtual]
```

References [SLICE\\_ORIENTATION\\_YZ](#).

**10.393.4.39 SetupInteractor()**

```
virtual void vtkImageColorViewer::SetupInteractor (
    vtkRenderWindowInteractor * ) [virtual]
```

**Examples**

[gdcmrptionplan.cxx](#), and [gdcmrtpplan.cxx](#).

**10.393.4.40 SetWindowId()**

```
virtual void vtkImageColorViewer::SetWindowId (
    void * a ) [virtual]
```

**10.393.4.41 UnInstallPipeline()**

```
virtual void vtkImageColorViewer::UnInstallPipeline ( ) [protected], [virtual]
```

**10.393.4.42 UpdateDisplayExtent()**

```
virtual void vtkImageColorViewer::UpdateDisplayExtent ( ) [virtual]
```

**10.393.4.43 UpdateOrientation()**

```
virtual void vtkImageColorViewer::UpdateOrientation ( ) [protected], [virtual]
```

**10.393.4.44 VTK\_LEGACY() [1/4]**

```
vtkImageColorViewer::VTK_LEGACY (
    int  GetWholeZMax() )
```

**10.393.4.45 VTK\_LEGACY() [2/4]**

```
vtkImageColorViewer::VTK_LEGACY (
    int  GetWholeZMin() )
```

**10.393.4.46 VTK\_LEGACY() [3/4]**

```
vtkImageColorViewer::VTK_LEGACY (
    int  GetZSlice() )
```

**10.393.4.47 VTK\_LEGACY() [4/4]**

```
vtkImageColorViewer::VTK_LEGACY (
    void  SetZSlice(int) )
```

**10.393.4.48 vtkBooleanMacro()**

```
vtkImageColorViewer::vtkBooleanMacro (
    OffScreenRendering ,
    int )
```

**10.393.4.49 vtkGetMacro() [1/2]**

```
vtkImageColorViewer::vtkGetMacro (
    Slice ,
    int )
```

**10.393.4.50 vtkGetMacro() [2/2]**

```
vtkImageColorViewer::vtkGetMacro (
    SliceOrientation ,
    int )
```

**10.393.4.51 vtkGetObjectMacro() [1/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    ImageActor ,
    vtkImageActor )
```

**10.393.4.52 vtkGetObjectMacro() [2/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    InteractorStyle ,
    vtkInteractorStyleImage )
```

**10.393.4.53 vtkGetObjectMacro() [3/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    Renderer ,
    vtkRenderer )
```

**10.393.4.54 vtkGetObjectMacro() [4/5]**

```
vtkImageColorViewer::vtkGetObjectMacro (
    RenderWindow ,
    vtkRenderWindow )
```



#### 10.393.4.55 vtkGetObjectMacro() [5/5]

```
vtkImageColorViewer::vtkGetObjectMacro (
    WindowLevel ,
    vtkImageMapToWindowLevelColors2 )
```

#### 10.393.4.56 vtkTypeMacro()

```
vtkImageColorViewer::vtkTypeMacro (
    vtkImageColorViewer ,
    vtkObject )
```

### 10.393.5 Friends And Related Function Documentation

#### 10.393.5.1 vtkImageColorViewerCallback

```
friend class vtkImageColorViewerCallback [friend]
```

### 10.393.6 Member Data Documentation

#### 10.393.6.1 FirstRender

```
int vtkImageColorViewer::FirstRender [protected]
```

#### 10.393.6.2 ImageActor

```
vtkImageActor* vtkImageColorViewer::ImageActor [protected]
```

#### 10.393.6.3 Interactor

```
vtkRenderWindowInteractor* vtkImageColorViewer::Interactor [protected]
```

#### 10.393.6.4 InteractorStyle

```
vtkInteractorStyleImage* vtkImageColorViewer::InteractorStyle [protected]
```

#### 10.393.6.5 OverlayImageActor

```
vtkImageActor* vtkImageColorViewer::OverlayImageActor [protected]
```

#### 10.393.6.6 Renderer

```
vtkRenderer* vtkImageColorViewer::Renderer [protected]
```

#### 10.393.6.7 RenderWindow

```
vtkRenderWindow* vtkImageColorViewer::RenderWindow [protected]
```

#### 10.393.6.8 Slice

```
int vtkImageColorViewer::Slice [protected]
```

#### 10.393.6.9 SliceOrientation

```
int vtkImageColorViewer::SliceOrientation [protected]
```

#### 10.393.6.10 WindowLevel

```
vtkImageMapToWindowLevelColors2* vtkImageColorViewer::WindowLevel [protected]
```

The documentation for this class was generated from the following file:

- [vtkImageColorViewer.h](#)

## 10.394 vtkImageMapToColors16 Class Reference

```
#include <vtkImageMapToColors16.h>
```

Inheritance diagram for vtkImageMapToColors16:

Collaboration diagram for vtkImageMapToColors16:

### Public Member Functions

- virtual unsigned long [GetMTime](#) ()
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- virtual void [SetLookupTable](#) (vtkScalarsToColors \*)
- void [SetOutputFormatToLuminance](#) ()
- void [SetOutputFormatToLuminanceAlpha](#) ()
- void [SetOutputFormatToRGB](#) ()
- void [SetOutputFormatToRGBA](#) ()
- [vtkBooleanMacro](#) ([PassAlphaToOutput](#), int)
- [vtkGetMacro](#) ([ActiveComponent](#), int)
- [vtkGetMacro](#) ([OutputFormat](#), int)
- [vtkGetMacro](#) ([PassAlphaToOutput](#), int)
- [vtkGetObjectMacro](#) ([LookupTable](#), vtkScalarsToColors)
- [vtkSetMacro](#) ([ActiveComponent](#), int)
- [vtkSetMacro](#) ([OutputFormat](#), int)
- [vtkSetMacro](#) ([PassAlphaToOutput](#), int)
- [vtkTypeMacro](#) ([vtkImageMapToColors16](#), vtkThreadedImageAlgorithm)

### Static Public Member Functions

- static [vtkImageMapToColors16](#) \* [New](#) ()

### Protected Member Functions

- [vtkImageMapToColors16](#) ()
- [~vtkImageMapToColors16](#) ()
- virtual int [RequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- virtual int [RequestInformation](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)
- void [ThreadedRequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector, vtkImageData \*\*\*inData, vtkImageData \*\*outData, int extent[6], int id)

### Protected Attributes

- int [ActiveComponent](#)
- int [DataWasPassed](#)
- vtkScalarsToColors \* [LookupTable](#)
- int [OutputFormat](#)
- int [PassAlphaToOutput](#)

## 10.394.1 Constructor & Destructor Documentation

### 10.394.1.1 vtkImageMapToColors16()

```
vtkImageMapToColors16::vtkImageMapToColors16 ( ) [protected]
```

### 10.394.1.2 ~vtkImageMapToColors16()

```
vtkImageMapToColors16::~~vtkImageMapToColors16 ( ) [protected]
```

## 10.394.2 Member Function Documentation

### 10.394.2.1 GetMTime()

```
virtual unsigned long vtkImageMapToColors16::GetMTime ( ) [virtual]
```

### 10.394.2.2 New()

```
static vtkImageMapToColors16 * vtkImageMapToColors16::New ( ) [static]
```

### 10.394.2.3 PrintSelf()

```
void vtkImageMapToColors16::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

#### 10.394.2.4 RequestData()

```
virtual int vtkImageMapToColors16::RequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector ) [protected], [virtual]
```

#### 10.394.2.5 RequestInformation()

```
virtual int vtkImageMapToColors16::RequestInformation (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected], [virtual]
```

#### 10.394.2.6 SetLookupTable()

```
virtual void vtkImageMapToColors16::SetLookupTable (
    vtkScalarsToColors * ) [virtual]
```

#### 10.394.2.7 SetOutputFormatToLuminance()

```
void vtkImageMapToColors16::SetOutputFormatToLuminance ( ) [inline]
```

#### 10.394.2.8 SetOutputFormatToLuminanceAlpha()

```
void vtkImageMapToColors16::SetOutputFormatToLuminanceAlpha ( ) [inline]
```

#### 10.394.2.9 SetOutputFormatToRGB()

```
void vtkImageMapToColors16::SetOutputFormatToRGB ( ) [inline]
```

**10.394.2.10 SetOutputFormatToRGBA()**

```
void vtkImageMapToColors16::SetOutputFormatToRGBA ( ) [inline]
```

**10.394.2.11 ThreadedRequestData()**

```
void vtkImageMapToColors16::ThreadedRequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector,
    vtkImageData *** inData,
    vtkImageData ** outData,
    int extent[6],
    int id ) [protected]
```

**10.394.2.12 vtkBooleanMacro()**

```
vtkImageMapToColors16::vtkBooleanMacro (
    PassAlphaToOutput ,
    int )
```

**10.394.2.13 vtkGetMacro() [1/3]**

```
vtkImageMapToColors16::vtkGetMacro (
    ActiveComponent ,
    int )
```

**10.394.2.14 vtkGetMacro() [2/3]**

```
vtkImageMapToColors16::vtkGetMacro (
    OutputFormat ,
    int )
```

**10.394.2.15 vtkGetMacro() [3/3]**

```
vtkImageMapToColors16::vtkGetMacro (
    PassAlphaToOutput ,
    int )
```

**10.394.2.16 vtkGetObjectMacro()**

```
vtkImageMapToColors16::vtkGetObjectMacro (
    LookupTable ,
    vtkScalarsToColors )
```

**10.394.2.17 vtkSetMacro() [1/3]**

```
vtkImageMapToColors16::vtkSetMacro (
    ActiveComponent ,
    int )
```

**10.394.2.18 vtkSetMacro() [2/3]**

```
vtkImageMapToColors16::vtkSetMacro (
    OutputFormat ,
    int )
```

**10.394.2.19 vtkSetMacro() [3/3]**

```
vtkImageMapToColors16::vtkSetMacro (
    PassAlphaToOutput ,
    int )
```

**10.394.2.20 vtkTypeMacro()**

```
vtkImageMapToColors16::vtkTypeMacro (
    vtkImageMapToColors16 ,
    vtkThreadedImageAlgorithm )
```

### 10.394.3 Member Data Documentation

#### 10.394.3.1 ActiveComponent

```
int vtkImageMapToColors16::ActiveComponent [protected]
```

#### 10.394.3.2 DataWasPassed

```
int vtkImageMapToColors16::DataWasPassed [protected]
```

#### 10.394.3.3 LookupTable

```
vtkScalarsToColors* vtkImageMapToColors16::LookupTable [protected]
```

#### 10.394.3.4 OutputFormat

```
int vtkImageMapToColors16::OutputFormat [protected]
```

#### 10.394.3.5 PassAlphaToOutput

```
int vtkImageMapToColors16::PassAlphaToOutput [protected]
```

The documentation for this class was generated from the following file:

- [vtkImageMapToColors16.h](#)

## 10.395 vtkImageMapToWindowLevelColors2 Class Reference

```
#include <vtkImageMapToWindowLevelColors2.h>
```

Inheritance diagram for vtkImageMapToWindowLevelColors2:

Collaboration diagram for vtkImageMapToWindowLevelColors2:



## Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkGetMacro](#) ([Level](#), double)
- [vtkGetMacro](#) ([Window](#), double)
- [vtkSetMacro](#) ([Level](#), double)
- [vtkSetMacro](#) ([Window](#), double)
- [vtkTypeMacro](#) ([vtkImageMapToWindowLevelColors2](#), vtkImageMapToColors)

## Static Public Member Functions

- static [vtkImageMapToWindowLevelColors2](#) \* [New](#) ()

## Protected Member Functions

- [vtkImageMapToWindowLevelColors2](#) ()
- [~vtkImageMapToWindowLevelColors2](#) ()
- virtual int [RequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector)
- virtual int [RequestInformation](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)
- void [ThreadedRequestData](#) (vtkInformation \*request, vtkInformationVector \*\*inputVector, vtkInformationVector \*outputVector, vtkImageData \*\*\*inData, vtkImageData \*\*outData, int extent[6], int id)

## Protected Attributes

- double [Level](#)
- double [Window](#)

## 10.395.1 Constructor & Destructor Documentation

### 10.395.1.1 [vtkImageMapToWindowLevelColors2\(\)](#)

```
vtkImageMapToWindowLevelColors2::vtkImageMapToWindowLevelColors2 ( ) [protected]
```

### 10.395.1.2 [~vtkImageMapToWindowLevelColors2\(\)](#)

```
vtkImageMapToWindowLevelColors2::~~vtkImageMapToWindowLevelColors2 ( ) [protected]
```

## 10.395.2 Member Function Documentation

### 10.395.2.1 New()

```
static vtkImageMapToWindowLevelColors2 * vtkImageMapToWindowLevelColors2::New ( ) [static]
```

### 10.395.2.2 PrintSelf()

```
void vtkImageMapToWindowLevelColors2::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

### 10.395.2.3 RequestData()

```
virtual int vtkImageMapToWindowLevelColors2::RequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector ) [protected], [virtual]
```

### 10.395.2.4 RequestInformation()

```
virtual int vtkImageMapToWindowLevelColors2::RequestInformation (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected], [virtual]
```

### 10.395.2.5 ThreadedRequestData()

```
void vtkImageMapToWindowLevelColors2::ThreadedRequestData (
    vtkInformation * request,
    vtkInformationVector ** inputVector,
    vtkInformationVector * outputVector,
    vtkImageData *** inData,
    vtkImageData ** outData,
    int extent[6],
    int id ) [protected]
```

**10.395.2.6 vtkGetMacro() [1/2]**

```
vtkImageMapToWindowLevelColors2::vtkGetMacro (
    Level ,
    double )
```

**10.395.2.7 vtkGetMacro() [2/2]**

```
vtkImageMapToWindowLevelColors2::vtkGetMacro (
    Window ,
    double )
```

**10.395.2.8 vtkSetMacro() [1/2]**

```
vtkImageMapToWindowLevelColors2::vtkSetMacro (
    Level ,
    double )
```

**10.395.2.9 vtkSetMacro() [2/2]**

```
vtkImageMapToWindowLevelColors2::vtkSetMacro (
    Window ,
    double )
```

**10.395.2.10 vtkTypeMacro()**

```
vtkImageMapToWindowLevelColors2::vtkTypeMacro (
    vtkImageMapToWindowLevelColors2 ,
    vtkImageMapToColors )
```

**10.395.3 Member Data Documentation**

### 10.395.3.1 Level

```
double vtkImageMapToWindowLevelColors2::Level [protected]
```

### 10.395.3.2 Window

```
double vtkImageMapToWindowLevelColors2::Window [protected]
```

The documentation for this class was generated from the following file:

- [vtkImageMapToWindowLevelColors2.h](#)

## 10.396 vtkImagePlanarComponentsToComponents Class Reference

```
#include <vtkImagePlanarComponentsToComponents.h>
```

Inheritance diagram for vtkImagePlanarComponentsToComponents:

Collaboration diagram for vtkImagePlanarComponentsToComponents:

### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkImagePlanarComponentsToComponents](#), vtkImageAlgorithm)

### Static Public Member Functions

- static [vtkImagePlanarComponentsToComponents](#) \* [New](#) ()

### Protected Member Functions

- [vtkImagePlanarComponentsToComponents](#) ()
- [~vtkImagePlanarComponentsToComponents](#) ()
- virtual int [RequestData](#) (vtkInformation \*, vtkInformationVector \*\*, vtkInformationVector \*)

### 10.396.1 Constructor & Destructor Documentation

### 10.396.1.1 vtkImagePlanarComponentsToComponents()

```
vtkImagePlanarComponentsToComponents::vtkImagePlanarComponentsToComponents ( ) [protected]
```

### 10.396.1.2 ~vtkImagePlanarComponentsToComponents()

```
vtkImagePlanarComponentsToComponents::~~vtkImagePlanarComponentsToComponents ( ) [inline], [protected]
```

## 10.396.2 Member Function Documentation

### 10.396.2.1 New()

```
static vtkImagePlanarComponentsToComponents * vtkImagePlanarComponentsToComponents::New ( ) [static]
```

### 10.396.2.2 PrintSelf()

```
void vtkImagePlanarComponentsToComponents::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

### 10.396.2.3 RequestData()

```
virtual int vtkImagePlanarComponentsToComponents::RequestData (
    vtkInformation * ,
    vtkInformationVector ** ,
    vtkInformationVector * ) [protected], [virtual]
```

### 10.396.2.4 vtkTypeMacro()

```
vtkImagePlanarComponentsToComponents::vtkTypeMacro (
    vtkImagePlanarComponentsToComponents ,
    vtkImageAlgorithm )
```

The documentation for this class was generated from the following file:

- [vtkImagePlanarComponentsToComponents.h](#)

## 10.397 vtkImageRGBToYBR Class Reference

```
#include <vtkImageRGBToYBR.h>
```

Inheritance diagram for vtkImageRGBToYBR:

Collaboration diagram for vtkImageRGBToYBR:

### Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkImageRGBToYBR](#), vtkThreadedImageAlgorithm)

### Static Public Member Functions

- static [vtkImageRGBToYBR](#) \* [New](#) ()

### Protected Member Functions

- [vtkImageRGBToYBR](#) ()
- [~vtkImageRGBToYBR](#) ()
- void [ThreadedExecute](#) (vtkImageData \*inData, vtkImageData \*outData, int ext[6], int id)

## 10.397.1 Constructor & Destructor Documentation

### 10.397.1.1 vtkImageRGBToYBR()

```
vtkImageRGBToYBR::vtkImageRGBToYBR ( ) [protected]
```

### 10.397.1.2 ~vtkImageRGBToYBR()

```
vtkImageRGBToYBR::~vtkImageRGBToYBR ( ) [inline], [protected]
```

## 10.397.2 Member Function Documentation

### 10.397.2.1 New()

```
static vtkImageRGBToYBR * vtkImageRGBToYBR::New ( ) [static]
```

### 10.397.2.2 PrintSelf()

```
void vtkImageRGBToYBR::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

### 10.397.2.3 ThreadedExecute()

```
void vtkImageRGBToYBR::ThreadedExecute (
    vtkImageData * inData,
    vtkImageData * outData,
    int ext[6],
    int id ) [protected]
```

### 10.397.2.4 vtkTypeMacro()

```
vtkImageRGBToYBR::vtkTypeMacro (
    vtkImageRGBToYBR ,
    vtkThreadedImageAlgorithm )
```

The documentation for this class was generated from the following file:

- [vtkImageRGBToYBR.h](#)

## 10.398 vtkImageYBRToRGB Class Reference

```
#include <vtkImageYBRToRGB.h>
```

Inheritance diagram for vtkImageYBRToRGB:

Collaboration diagram for vtkImageYBRToRGB:

## Public Member Functions

- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkTypeMacro](#) ([vtkImageYBRToRGB](#), vtkThreadedImageAlgorithm)

## Static Public Member Functions

- static [vtkImageYBRToRGB](#) \* [New](#) ()

## Protected Member Functions

- [vtkImageYBRToRGB](#) ()
- [~vtkImageYBRToRGB](#) ()
- void [ThreadedExecute](#) (vtkImageData \*inData, vtkImageData \*outData, int ext[6], int id)

## 10.398.1 Constructor & Destructor Documentation

### 10.398.1.1 [vtkImageYBRToRGB](#)()

```
vtkImageYBRToRGB::vtkImageYBRToRGB ( ) [protected]
```

### 10.398.1.2 [~vtkImageYBRToRGB](#)()

```
vtkImageYBRToRGB::~~vtkImageYBRToRGB ( ) [inline], [protected]
```

## 10.398.2 Member Function Documentation

### 10.398.2.1 [New](#)()

```
static vtkImageYBRToRGB * vtkImageYBRToRGB::New ( ) [static]
```



### 10.398.2.2 PrintSelf()

```
void vtkImageYBRToRGB::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

### 10.398.2.3 ThreadedExecute()

```
void vtkImageYBRToRGB::ThreadedExecute (
    vtkImageData * inData,
    vtkImageData * outData,
    int ext[6],
    int id ) [protected]
```

### 10.398.2.4 vtkTypeMacro()

```
vtkImageYBRToRGB::vtkTypeMacro (
    vtkImageYBRToRGB ,
    vtkThreadedImageAlgorithm )
```

The documentation for this class was generated from the following file:

- [vtkImageYBRToRGB.h](#)

## 10.399 vtkLookupTable16 Class Reference

```
#include <vtkLookupTable16.h>
```

Inheritance diagram for vtkLookupTable16:

Collaboration diagram for vtkLookupTable16:

### Public Member Functions

- void [Build](#) ()
- unsigned short \* [GetPointer](#) (const vtkIdType id)
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- void [SetNumberOfTableValues](#) (vtkIdType number)
- [vtkTypeMacro](#) ([vtkLookupTable16](#), vtkLookupTable)
- unsigned char \* [WritePointer](#) (const vtkIdType id, const int number)

## Static Public Member Functions

- static [vtkLookupTable16](#) \* [New](#) ()

## Protected Member Functions

- [vtkLookupTable16](#) (int size=256, int ext=256)
- [~vtkLookupTable16](#) ()
- void [MapScalarsThroughTable2](#) (void \*input, unsigned char \*output, int inputDataType, int numberOfValues, int inputIncrement, int outputFormat)

## Protected Attributes

- vtkUnsignedShortArray \* [Table16](#)

## 10.399.1 Constructor & Destructor Documentation

### 10.399.1.1 [vtkLookupTable16\(\)](#)

```
vtkLookupTable16::vtkLookupTable16 (  
    int size = 256,  
    int ext = 256 ) [protected]
```

### 10.399.1.2 [~vtkLookupTable16\(\)](#)

```
vtkLookupTable16::~~vtkLookupTable16 ( ) [protected]
```

## 10.399.2 Member Function Documentation

### 10.399.2.1 [Build\(\)](#)

```
void vtkLookupTable16::Build ( )
```

### 10.399.2.2 GetPointer()

```
unsigned short * vtkLookupTable16::GetPointer (
    const vtkIdType id ) [inline]
```

### 10.399.2.3 MapScalarsThroughTable2()

```
void vtkLookupTable16::MapScalarsThroughTable2 (
    void * input,
    unsigned char * output,
    int inputDataType,
    int numberOfValues,
    int inputIncrement,
    int outputFormat ) [protected]
```

### 10.399.2.4 New()

```
static vtkLookupTable16 * vtkLookupTable16::New ( ) [static]
```

### 10.399.2.5 PrintSelf()

```
void vtkLookupTable16::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

### 10.399.2.6 SetNumberOfTableValues()

```
void vtkLookupTable16::SetNumberOfTableValues (
    vtkIdType number )
```

### 10.399.2.7 vtkTypeMacro()

```
vtkLookupTable16::vtkTypeMacro (
    vtkLookupTable16 ,
    vtkLookupTable )
```

### 10.399.2.8 WritePointer()

```
unsigned char * vtkLookupTable16::WritePointer (
    const vtkIdType id,
    const int number ) [inline]
```

References [Table16](#).

## 10.399.3 Member Data Documentation

### 10.399.3.1 Table16

```
vtkUnsignedShortArray* vtkLookupTable16::Table16 [protected]
```

Referenced by [WritePointer\(\)](#).

The documentation for this class was generated from the following file:

- [vtkLookupTable16.h](#)

## 10.400 vtkRTStructSetProperties Class Reference

```
#include <vtkRTStructSetProperties.h>
```

Inheritance diagram for vtkRTStructSetProperties:

Collaboration diagram for vtkRTStructSetProperties:

### Public Member Functions

- void [AddContourReferencedFrameOfReference](#) (vtkIdType pdnum, const char \*classuid, const char \*instanceuid)
- void [AddReferencedFrameOfReference](#) (const char \*classuid, const char \*instanceuid)
- void [AddStructureSetROI](#) (int roinumber, const char \*refframerefid, const char \*roiname, const char \*ROIGenerationAlgorithm, const char \*ROIDescription=0)
- void [AddStructureSetROIObservation](#) (int refnumber, int observationnumber, const char \*rtroiinterpretedtype, const char \*roiinterpreter, const char \*roiobservationlabel=0)
- virtual void [Clear](#) ()
- virtual void [DeepCopy](#) (vtkRTStructSetProperties \*p)
- const char \* [GetContourReferencedFrameOfReferenceClassUID](#) (vtkIdType pdnum, vtkIdType id)
- const char \* [GetContourReferencedFrameOfReferenceInstanceUID](#) (vtkIdType pdnum, vtkIdType id)
- vtkIdType [GetNumberOfContourReferencedFrameOfReferences](#) ()
- vtkIdType [GetNumberOfContourReferencedFrameOfReferences](#) (vtkIdType pdnum)
- vtkIdType [GetNumberOfReferencedFrameOfReferences](#) ()

- vtkIdType [GetNumberOfStructureSetROIs](#) ()
- const char \* [GetReferencedFrameOfReferenceClassUID](#) (vtkIdType id)
- const char \* [GetReferencedFrameOfReferenceInstanceUID](#) (vtkIdType id)
- int [GetStructureSetObservationNumber](#) (vtkIdType id)
- const char \* [GetStructureSetROIDescription](#) (vtkIdType id)
- const char \* [GetStructureSetROIGenerationAlgorithm](#) (vtkIdType)
- const char \* [GetStructureSetROIName](#) (vtkIdType)
- int [GetStructureSetROINumber](#) (vtkIdType id)
- const char \* [GetStructureSetROIObservationLabel](#) (vtkIdType id)
- const char \* [GetStructureSetROIRefFrameRefUID](#) (vtkIdType)
- const char \* [GetStructureSetRTROIInterpretedType](#) (vtkIdType id)
- void [PrintSelf](#) (ostream &os, vtkIndent indent)
- [vtkGetStringMacro](#) (ReferenceFrameOfReferenceUID)
- [vtkGetStringMacro](#) (ReferenceSeriesInstanceUID)
- [vtkGetStringMacro](#) (SeriesInstanceUID)
- [vtkGetStringMacro](#) (SOPInstanceUID)
- [vtkGetStringMacro](#) (StructureSetDate)
- [vtkGetStringMacro](#) (StructureSetLabel)
- [vtkGetStringMacro](#) (StructureSetName)
- [vtkGetStringMacro](#) (StructureSetTime)
- [vtkGetStringMacro](#) (StudyInstanceUID)
- [vtkSetStringMacro](#) (ReferenceFrameOfReferenceUID)
- [vtkSetStringMacro](#) (ReferenceSeriesInstanceUID)
- [vtkSetStringMacro](#) (SeriesInstanceUID)
- [vtkSetStringMacro](#) (SOPInstanceUID)
- [vtkSetStringMacro](#) (StructureSetDate)
- [vtkSetStringMacro](#) (StructureSetLabel)
- [vtkSetStringMacro](#) (StructureSetName)
- [vtkSetStringMacro](#) (StructureSetTime)
- [vtkSetStringMacro](#) (StudyInstanceUID)
- [vtkTypeMacro](#) (vtkRTStructSetProperties, vtkObject)

## Static Public Member Functions

- static [vtkRTStructSetProperties \\* New](#) ()

## Protected Member Functions

- [vtkRTStructSetProperties](#) ()
- [~vtkRTStructSetProperties](#) ()

## Protected Attributes

- vtkRTStructSetPropertiesInternals \* [Internals](#)
- char \* [ReferenceFrameOfReferenceUID](#)
- char \* [ReferenceSeriesInstanceUID](#)
- char \* [SeriesInstanceUID](#)
- char \* [SOPInstanceUID](#)
- char \* [StructureSetDate](#)
- char \* [StructureSetLabel](#)
- char \* [StructureSetName](#)
- char \* [StructureSetTime](#)
- char \* [StudyInstanceUID](#)

### 10.400.1 Detailed Description

#### Examples

[GenerateRTSTRUCT.cxx](#).

### 10.400.2 Constructor & Destructor Documentation

#### 10.400.2.1 vtkRTStructSetProperties()

```
vtkRTStructSetProperties::vtkRTStructSetProperties ( ) [protected]
```

#### 10.400.2.2 ~vtkRTStructSetProperties()

```
vtkRTStructSetProperties::~~vtkRTStructSetProperties ( ) [protected]
```

### 10.400.3 Member Function Documentation

#### 10.400.3.1 AddContourReferencedFrameOfReference()

```
void vtkRTStructSetProperties::AddContourReferencedFrameOfReference (
    vtkIdType pdnum,
    const char * classuid,
    const char * instanceuid )
```

#### 10.400.3.2 AddReferencedFrameOfReference()

```
void vtkRTStructSetProperties::AddReferencedFrameOfReference (
    const char * classuid,
    const char * instanceuid )
```

### 10.400.3.3 AddStructureSetROI()

```
void vtkRTStructSetProperties::AddStructureSetROI (
    int roinumber,
    const char * refframerefuid,
    const char * roiname,
    const char * ROIGenerationAlgorithm,
    const char * ROIDescription = 0 )
```

### 10.400.3.4 AddStructureSetROIObservation()

```
void vtkRTStructSetProperties::AddStructureSetROIObservation (
    int refnumber,
    int observationnumber,
    const char * rtroiinterpretedtype,
    const char * roiinterpreter,
    const char * roiobservationlabel = 0 )
```

### 10.400.3.5 Clear()

```
virtual void vtkRTStructSetProperties::Clear ( ) [virtual]
```

### 10.400.3.6 DeepCopy()

```
virtual void vtkRTStructSetProperties::DeepCopy (
    vtkRTStructSetProperties * p ) [virtual]
```

### 10.400.3.7 GetContourReferencedFrameOfReferenceClassUID()

```
const char * vtkRTStructSetProperties::GetContourReferencedFrameOfReferenceClassUID (
    vtkIdType pdnum,
    vtkIdType id )
```

**10.400.3.8 GetContourReferencedFrameOfReferenceInstanceUID()**

```
const char * vtkRTStructSetProperties::GetContourReferencedFrameOfReferenceInstanceUID (
    vtkIdType pdnum,
    vtkIdType id )
```

**10.400.3.9 GetNumberOfContourReferencedFrameOfReferences()** [1/2]

```
vtkIdType vtkRTStructSetProperties::GetNumberOfContourReferencedFrameOfReferences ( )
```

**10.400.3.10 GetNumberOfContourReferencedFrameOfReferences()** [2/2]

```
vtkIdType vtkRTStructSetProperties::GetNumberOfContourReferencedFrameOfReferences (
    vtkIdType pdnum )
```

**10.400.3.11 GetNumberOfReferencedFrameOfReferences()**

```
vtkIdType vtkRTStructSetProperties::GetNumberOfReferencedFrameOfReferences ( )
```

**10.400.3.12 GetNumberOfStructureSetROIs()**

```
vtkIdType vtkRTStructSetProperties::GetNumberOfStructureSetROIs ( )
```

**10.400.3.13 GetReferencedFrameOfReferenceClassUID()**

```
const char * vtkRTStructSetProperties::GetReferencedFrameOfReferenceClassUID (
    vtkIdType id )
```

**10.400.3.14 GetReferencedFrameOfReferenceInstanceUID()**

```
const char * vtkRTStructSetProperties::GetReferencedFrameOfReferenceInstanceUID (
    vtkIdType id )
```



**10.400.3.15 GetStructureSetObservationNumber()**

```
int vtkRTStructSetProperties::GetStructureSetObservationNumber (
    vtkIdType id )
```

**10.400.3.16 GetStructureSetROIDescription()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIDescription (
    vtkIdType id )
```

**10.400.3.17 GetStructureSetROIGenerationAlgorithm()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIGenerationAlgorithm (
    vtkIdType )
```

**10.400.3.18 GetStructureSetROIName()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIName (
    vtkIdType )
```

**10.400.3.19 GetStructureSetROINumber()**

```
int vtkRTStructSetProperties::GetStructureSetROINumber (
    vtkIdType id )
```

**10.400.3.20 GetStructureSetROIObservationLabel()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIObservationLabel (
    vtkIdType id )
```

**10.400.3.21 GetStructureSetROIRefFrameRefUID()**

```
const char * vtkRTStructSetProperties::GetStructureSetROIRefFrameRefUID (
    vtkIdType )
```

**10.400.3.22 GetStructureSetRTROIInterpretedType()**

```
const char * vtkRTStructSetProperties::GetStructureSetRTROIInterpretedType (
    vtkIdType id )
```

**10.400.3.23 New()**

```
static vtkRTStructSetProperties * vtkRTStructSetProperties::New ( ) [static]
```

**Examples**

[GenerateRTSTRUCT.cxx](#).

**10.400.3.24 PrintSelf()**

```
void vtkRTStructSetProperties::PrintSelf (
    ostream & os,
    vtkIndent indent )
```

**10.400.3.25 vtkGetStringMacro() [1/9]**

```
vtkRTStructSetProperties::vtkGetStringMacro (
    ReferenceFrameOfReferenceUID )
```

**10.400.3.26 vtkGetStringMacro() [2/9]**

```
vtkRTStructSetProperties::vtkGetStringMacro (
    ReferenceSeriesInstanceUID )
```

**10.400.3.27 vtkGetStringMacro()** [3/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    SeriesInstanceUID )
```

**10.400.3.28 vtkGetStringMacro()** [4/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    SOPInstanceUID )
```

**10.400.3.29 vtkGetStringMacro()** [5/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetDate )
```

**10.400.3.30 vtkGetStringMacro()** [6/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetLabel )
```

**10.400.3.31 vtkGetStringMacro()** [7/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetName )
```

**10.400.3.32 vtkGetStringMacro()** [8/9]

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StructureSetTime )
```

**10.400.3.33 vtkGetStringMacro() [9/9]**

```
vtkRTStructSetProperties::vtkGetStringMacro (
    StudyInstanceUID )
```

**10.400.3.34 vtkSetStringMacro() [1/9]**

```
vtkRTStructSetProperties::vtkSetStringMacro (
    ReferenceFrameOfReferenceUID )
```

**10.400.3.35 vtkSetStringMacro() [2/9]**

```
vtkRTStructSetProperties::vtkSetStringMacro (
    ReferenceSeriesInstanceUID )
```

**10.400.3.36 vtkSetStringMacro() [3/9]**

```
vtkRTStructSetProperties::vtkSetStringMacro (
    SeriesInstanceUID )
```

**10.400.3.37 vtkSetStringMacro() [4/9]**

```
vtkRTStructSetProperties::vtkSetStringMacro (
    SOPInstanceUID )
```

**10.400.3.38 vtkSetStringMacro() [5/9]**

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetDate )
```

**10.400.3.39 vtkSetStringMacro()** [6/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetLabel )
```

**10.400.3.40 vtkSetStringMacro()** [7/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetName )
```

**10.400.3.41 vtkSetStringMacro()** [8/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StructureSetTime )
```

**10.400.3.42 vtkSetStringMacro()** [9/9]

```
vtkRTStructSetProperties::vtkSetStringMacro (
    StudyInstanceUID )
```

**10.400.3.43 vtkTypeMacro()**

```
vtkRTStructSetProperties::vtkTypeMacro (
    vtkRTStructSetProperties ,
    vtkObject )
```

**10.400.4 Member Data Documentation****10.400.4.1 Internals**

```
vtkRTStructSetPropertiesInternals* vtkRTStructSetProperties::Internals [protected]
```

#### 10.400.4.2 ReferenceFrameOfReferenceUID

```
char* vtkRTStructSetProperties::ReferenceFrameOfReferenceUID [protected]
```

#### 10.400.4.3 ReferenceSeriesInstanceUID

```
char* vtkRTStructSetProperties::ReferenceSeriesInstanceUID [protected]
```

#### 10.400.4.4 SeriesInstanceUID

```
char* vtkRTStructSetProperties::SeriesInstanceUID [protected]
```

#### 10.400.4.5 SOPInstanceUID

```
char* vtkRTStructSetProperties::SOPInstanceUID [protected]
```

#### 10.400.4.6 StructureSetDate

```
char* vtkRTStructSetProperties::StructureSetDate [protected]
```

#### 10.400.4.7 StructureSetLabel

```
char* vtkRTStructSetProperties::StructureSetLabel [protected]
```

#### 10.400.4.8 StructureSetName

```
char* vtkRTStructSetProperties::StructureSetName [protected]
```

#### 10.400.4.9 StructureSetTime

```
char* vtkRTStructSetProperties::StructureSetTime [protected]
```

#### 10.400.4.10 StudyInstanceUID

```
char* vtkRTStructSetProperties::StudyInstanceUID [protected]
```

The documentation for this class was generated from the following file:

- [vtkRTStructSetProperties.h](#)

## 10.401 gdcm::Waveform Class Reference

[Waveform](#) class.

```
#include <gdcmWaveform.h>
```

### Public Member Functions

- [Waveform](#) ()=default

#### 10.401.1 Detailed Description

[Waveform](#) class.

#### 10.401.2 Constructor & Destructor Documentation

##### 10.401.2.1 Waveform()

```
gdcm::Waveform::Waveform ( ) [default]
```

The documentation for this class was generated from the following file:

- [gdcmWaveform.h](#)

## 10.402 gdcm::WLMFindQuery Class Reference

PatientRootQuery.

```
#include <gdcmWLMFindQuery.h>
```

Inheritance diagram for gdcm::WLMFindQuery:

Collaboration diagram for gdcm::WLMFindQuery:

### Public Member Functions

- [WLMFindQuery](#) ()
- [UIDs::TSName GetAbstractSyntaxUID](#) () const override
- [std::vector< Tag > GetTagListByLevel](#) (const [EQueryLevel](#) &inQueryLevel) override
- void [InitializeDataSet](#) (const [EQueryLevel](#) &inQueryLevel) override
- bool [ValidateQuery](#) (bool inStrict=true) const override

### Protected Member Functions

- [DataSet GetValidDataSet](#) () const

### Friends

- class [QueryFactory](#)

### Additional Inherited Members

#### 10.402.1 Detailed Description

PatientRootQuery.

contains: the class which will produce a dataset for c-find with patient root

#### 10.402.2 Constructor & Destructor Documentation

##### 10.402.2.1 WLMFindQuery()

```
gdcm::WLMFindQuery::WLMFindQuery ( )
```



## 10.402.3 Member Function Documentation

### 10.402.3.1 GetAbstractSyntaxUID()

```
UIDs::TSName gdcm::WLMFindQuery::GetAbstractSyntaxUID ( ) const [override], [virtual]
```

Implements [gdcm::BaseQuery](#).

### 10.402.3.2 GetTagListByLevel()

```
std::vector< Tag > gdcm::WLMFindQuery::GetTagListByLevel (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function will return all tags at a given query level, so that they maybe selected for searching. The boolean forFind is true if the query is a find query, or false for a move query.

Implements [gdcm::BaseRootQuery](#).

### 10.402.3.3 GetValidDataSet()

```
DataSet gdcm::WLMFindQuery::GetValidDataSet ( ) const [protected]
```

### 10.402.3.4 InitializeDataSet()

```
void gdcm::WLMFindQuery::InitializeDataSet (
    const EQueryLevel & inQueryLevel ) [override], [virtual]
```

this function sets tag 8,52 to the appropriate value based on query level also fills in the right unique tags, as per the standard's requirements should allow for connection with dcmTk

Implements [gdcm::BaseRootQuery](#).

### 10.402.3.5 ValidateQuery()

```
bool gdcmm::WLMFindQuery::ValidateQuery (
    bool inStrict = true ) const  [override], [virtual]
```

have to be able to ensure that 0x8,0x52 is set (which will be true if InitializeDataSet is called...) that the level is appropriate (ie, not setting PATIENT for a study query that the tags in the query match the right level (either required, unique, optional) by default, this function checks to see if the query is for finding, which is more permissive than for moving. For moving, only the unique tags are allowed. 10 Jan 2011: adding in the 'strict' mode. according to the standard (at least, how I've read it), only tags for a particular level should be allowed in a particular query (ie, just series level tags in a series level query). However, it seems that dcm4chee doesn't share that interpretation. So, if 'inStrict' is false, then tags from the current level and all higher levels are now considered valid. So, if you're doing a non-strict series-level query, tags from the patient and study level can be passed along as well.

Implements [gdcmm::BaseRootQuery](#).

## 10.402.4 Friends And Related Function Documentation

### 10.402.4.1 QueryFactory

```
friend class QueryFactory  [friend]
```

The documentation for this class was generated from the following file:

- [gdcmmWLMFindQuery.h](#)

## 10.403 gdcmm::Writer Class Reference

[Writer](#) ala DOM (Document [Object](#) Model)

```
#include <gdcmmWriter.h>
```

Inheritance diagram for gdcmm::Writer:

Collaboration diagram for gdcmm::Writer:

## Public Member Functions

- [Writer](#) ()
- virtual [~Writer](#) ()
- void [CheckFileMetaInformationOff](#) ()
- void [CheckFileMetaInformationOn](#) ()
- [File](#) & [GetFile](#) ()
- void [SetCheckFileMetaInformation](#) (bool b)  
*Undocumented function, do not use (= leave default)*
- void [SetFile](#) (const [File](#) &f)  
*Set/Get the DICOM file ([DataSet](#) + Header)*
- void [SetFileName](#) (const char \*filename\_native)  
*Set the filename of DICOM file to write:*
- void [SetStream](#) (std::ostream &output\_stream)  
*Set user ostream buffer.*
- virtual bool [Write](#) ()  
*Main function to tell the writer to write.*

## Protected Member Functions

- bool [GetCheckFileMetaInformation](#) () const
- std::ostream \* [GetStreamPtr](#) () const
- void [SetWriteDataSetOnly](#) (bool b)

## Protected Attributes

- std::ofstream \* [Ofstream](#)
- std::ostream \* [Stream](#)

## Friends

- class [StreamImageWriter](#)

### 10.403.1 Detailed Description

[Writer](#) ala DOM (Document [Object](#) Model)

This class is a non-validating writer, it will only performs well- formedness check only.

Detailed description here To avoid GDCM being yet another broken DICOM lib we try to be user level and avoid writing illegal stuff (odd length, non-zero value for [Item](#) start/end length ...) Therefore you cannot (well unless you are really smart) write DICOM with even length tag. All the checks are consider basics:

- Correct Meta Information Header (see [gdcm::FileMetaInformation](#))
- Zero value for [Item](#) Length (0xfffe, 0xe00d/0xe0dd)
- Even length for any elements
- Alphabetical order for elements (guaranteed by design of internals)
- 32bits [VR](#) will be rewritten with 00

**Warning**

`gdcm::Writer` cannot write a [DataSet](#) if no SOP Instance UID (0008,0018) is found, unless a [DICOMDIR](#) is being written out

**See also**

[Reader DataSet File](#)

**Examples**

[BasicAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAI BugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAIIVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReformatFile.cs](#), [StreamImageReaderTest.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

## 10.403.2 Constructor & Destructor Documentation

### 10.403.2.1 Writer()

```
gdcm::Writer::Writer ( )
```

### 10.403.2.2 ~Writer()

```
virtual gdcm::Writer::~~Writer ( ) [virtual]
```

## 10.403.3 Member Function Documentation

### 10.403.3.1 CheckFileMetaInformationOff()

```
void gdcm::Writer::CheckFileMetaInformationOff ( ) [inline]
```

**Examples**

[CreateFakeRTDOSE.cxx](#), [FixBrokenJ2K.cxx](#), and [HelloWorld.cxx](#).

### 10.403.3.2 CheckFileMetaInformationOn()

```
void gdcm::Writer::CheckFileMetaInformationOn ( ) [inline]
```

### 10.403.3.3 GetCheckFileMetaInformation()

```
bool gdcm::Writer::GetCheckFileMetaInformation ( ) const [inline], [protected]
```

### 10.403.3.4 GetFile()

```
File & gdcm::Writer::GetFile ( ) [inline]
```

#### Examples

[CreateJPIPDataSet.cxx](#), [EncapsulateFileInRawData.cxx](#), [Extracting\\_All\\_Resolution.cxx](#), [Fake\\_Image\\_Using\\_Stream\\_Image\\_Writer](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GetSubSequenceData.cxx](#), [MpegVideoInfo.cs](#), [QIDO-RS.cxx](#), [StreamImageReaderTest.cxx](#), [TemplateEmptyImage.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.403.3.5 GetStreamPtr()

```
std::ostream * gdcm::Writer::GetStreamPtr ( ) const [inline], [protected]
```

### 10.403.3.6 SetCheckFileMetaInformation()

```
void gdcm::Writer::SetCheckFileMetaInformation (
    bool b ) [inline]
```

Undocumented function, do not use (= leave default)

#### Examples

[GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), and [PatchFile.cxx](#).

### 10.403.3.7 SetFile()

```
void gdcmm::Writer::SetFile (
    const File & f ) [inline]
```

Set/Get the DICOM file ([DataSet](#) + Header)

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateFakeRTDOSE.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [NewSequence.cs](#), [PatchFile.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.403.3.8 SetFileName()

```
void gdcmm::Writer::SetFileName (
    const char * filename_native )
```

Set the filename of DICOM file to write:

#### Examples

[BasicAnonymizer.cs](#), [BasicImageAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CompressImage.cxx](#), [CompressLossyJPEG.cs](#), [CreateARGBImage.cxx](#), [CreateCMYKImage.cxx](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DecompressImage.cs](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenFakeImage.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [GetSubSequenceData.cxx](#), [HelloVizWorld.cxx](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [MergeTwoFiles.cxx](#), [MpegVideoInfo.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReformatFile.cs](#), [StandardizeFiles.cs](#), [TemplateEmptyImage.cxx](#), [csa2img.cxx](#), [iU22tomultisc.cxx](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.403.3.9 SetStream()

```
void gdcmm::Writer::SetStream (
    std::ostream & output_stream ) [inline]
```

Set user ostream buffer.

#### 10.403.3.10 SetWriteDataSetOnly()

```
void gdcm::Writer::SetWriteDataSetOnly (
    bool b ) [inline], [protected]
```

#### 10.403.3.11 Write()

```
virtual bool gdcm::Writer::Write ( ) [virtual]
```

Main function to tell the writer to write.

Reimplemented in [gdcm::ImageWriter](#), [gdcm::PixmapWriter](#), [gdcm::SegmentWriter](#), and [gdcm::SurfaceWriter](#).

#### Examples

[BasicAnonymizer.cs](#), [ChangePrivateTags.cxx](#), [ChangeSequenceUltrasound.cxx](#), [Cleaner.cs](#), [ClinicalTrialAnnotate.cxx](#), [ClinicalTrialIdentificationWorkflow.cs](#), [CreateFakeRTDOSE.cxx](#), [CreateJPIPDataSet.cxx](#), [DeriveSeries.cxx](#), [DuplicatePCDE.cxx](#), [EncapsulateFileInRawData.cxx](#), [FixBrokenJ2K.cxx](#), [FixJAIBugJPEGLS.cxx](#), [FixOrientation.cxx](#), [GenAllVR.cxx](#), [GenFakeIdentifyFile.cxx](#), [GenLongSeqs.cxx](#), [GenSeqs.cxx](#), [GenerateDICOMDIR.cs](#), [HelloWorld.cxx](#), [LargeVRDSExplicit.cxx](#), [MakeTemplate.cxx](#), [ManipulateFile.cs](#), [NewSequence.cs](#), [PatchFile.cxx](#), [QIDO-RS.cxx](#), [ReformatFile.cs](#), [pmsct\\_rgb1.cxx](#), and [rle2img.cxx](#).

### 10.403.4 Friends And Related Function Documentation

#### 10.403.4.1 StreamImageWriter

```
friend class StreamImageWriter [friend]
```

### 10.403.5 Member Data Documentation

#### 10.403.5.1 Ofstream

```
std::ofstream* gdcm::Writer::Ofstream [protected]
```

### 10.403.5.2 Stream

```
std::ostream* gdcM::Writer::Stream [protected]
```

The documentation for this class was generated from the following file:

- [gdcMWriter.h](#)

## 10.404 gdcM::XMLDictReader Class Reference

Class for representing a [XMLDictReader](#).

```
#include <gdcMXMLDictReader.h>
```

Inheritance diagram for gdcM::XMLDictReader:

Collaboration diagram for gdcM::XMLDictReader:

### Public Member Functions

- [XMLDictReader](#) ()
- [~XMLDictReader](#) ()
- void [CharacterDataHandler](#) (const char \*data, int length)
- void [EndElement](#) (const char \*name)
- const [Dict](#) & [GetDict](#) ()
- void [StartElement](#) (const char \*name, const char \*\*atts)

### Protected Member Functions

- void [HandleDescription](#) (const char \*\*atts)
- void [HandleEntry](#) (const char \*\*atts)

### 10.404.1 Detailed Description

Class for representing a [XMLDictReader](#).

#### Note

bla Will read the DICOMV3.xml file

### 10.404.2 Constructor & Destructor Documentation



### 10.404.2.1 XMLDictReader()

```
gdcm::XMLDictReader::XMLDictReader ( )
```

### 10.404.2.2 ~XMLDictReader()

```
gdcm::XMLDictReader::~~XMLDictReader ( ) [inline]
```

## 10.404.3 Member Function Documentation

### 10.404.3.1 CharacterDataHandler()

```
void gdcm::XMLDictReader::CharacterDataHandler (
    const char * data,
    int length ) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 10.404.3.2 EndElement()

```
void gdcm::XMLDictReader::EndElement (
    const char * name ) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 10.404.3.3 GetDict()

```
const Dict & gdcm::XMLDictReader::GetDict ( ) [inline]
```

### 10.404.3.4 HandleDescription()

```
void gdcm::XMLDictReader::HandleDescription (
    const char ** atts ) [protected]
```

#### 10.404.3.5 HandleEntry()

```
void gdcM::XMLDictReader::HandleEntry (
    const char ** atts ) [protected]
```

#### 10.404.3.6 StartElement()

```
void gdcM::XMLDictReader::StartElement (
    const char * name,
    const char ** atts ) [virtual]
```

Reimplemented from [gdcM::TableReader](#).

The documentation for this class was generated from the following file:

- [gdcMXMLDictReader.h](#)

### 10.405 gdcM::XMLPrinter Class Reference

```
#include <gdcMXMLPrinter.h>
```

Collaboration diagram for gdcM::XMLPrinter:

#### Public Types

- enum [PrintStyles](#) {  
    [OnlyUUID](#) = 0 ,  
    [LOADBULKDATA](#) = 1 }

#### Public Member Functions

- [XMLPrinter](#) ()
- virtual [~XMLPrinter](#) ()
- [PrintStyles](#) [GetPrintStyle](#) () const
- virtual void [HandleBulkData](#) (const char \*uuid, const [TransferSyntax](#) &ts, const char \*bulkdata, size\_t bulklen)
- void [Print](#) (std::ostream &os)
- void [PrintDataSet](#) (const [DataSet](#) &ds, const [TransferSyntax](#) &ts, std::ostream &os)
- void [SetFile](#) ([File](#) const &f)
- void [SetStyle](#) ([PrintStyles](#) ps)

## Protected Member Functions

- [VR PrintDataElement](#) (std::ostream &os, const [Dicts](#) &dicts, const [DataSet](#) &ds, const [DataElement](#) &de, const [TransferSyntax](#) &ts)
- void [PrintSQ](#) (const [SequenceOfItems](#) \*sqi, const [TransferSyntax](#) &ts, std::ostream &os)

## Protected Attributes

- const [File](#) \* F
- [PrintStyles](#) [PrintStyle](#)

## 10.405.1 Member Enumeration Documentation

### 10.405.1.1 PrintStyles

```
enum gdcm::XMLPrinter::PrintStyles
```

Enumerator

OnlyUUID	
LOADBULKDATA	

## 10.405.2 Constructor & Destructor Documentation

### 10.405.2.1 XMLPrinter()

```
gdcm::XMLPrinter::XMLPrinter ( )
```

### 10.405.2.2 ~XMLPrinter()

```
virtual gdcm::XMLPrinter::~~XMLPrinter ( ) [virtual]
```

## 10.405.3 Member Function Documentation

#### 10.405.3.1 GetPrintStyle()

```
PrintStyle gdcm::XMLPrinter::GetPrintStyle ( ) const [inline]
```

#### 10.405.3.2 HandleBulkData()

```
virtual void gdcm::XMLPrinter::HandleBulkData (
    const char * uuid,
    const TransferSyntax & ts,
    const char * bulkdata,
    size_t bulklen ) [virtual]
```

Virtual function mechanism to allow application programmer to override the default mechanism for BulkData handling. By default GDCM will simply discard the BulkData and only write the UUID

#### 10.405.3.3 Print()

```
void gdcm::XMLPrinter::Print (
    std::ostream & os )
```

#### 10.405.3.4 PrintDataElement()

```
VR gdcm::XMLPrinter::PrintDataElement (
    std::ostream & os,
    const Dicts & dicts,
    const DataSet & ds,
    const DataElement & de,
    const TransferSyntax & ts ) [protected]
```

#### 10.405.3.5 PrintDataSet()

```
void gdcm::XMLPrinter::PrintDataSet (
    const DataSet & ds,
    const TransferSyntax & ts,
    std::ostream & os )
```

### 10.405.3.6 PrintSQ()

```
void gdcm::XMLPrinter::PrintSQ (
    const SequenceOfItems * sqi,
    const TransferSyntax & ts,
    std::ostream & os ) [protected]
```

### 10.405.3.7 SetFile()

```
void gdcm::XMLPrinter::SetFile (
    File const & f ) [inline]
```

### 10.405.3.8 SetStyle()

```
void gdcm::XMLPrinter::SetStyle (
    PrintStyles ps ) [inline]
```

## 10.405.4 Member Data Documentation

### 10.405.4.1 F

```
const File* gdcm::XMLPrinter::F [protected]
```

### 10.405.4.2 PrintStyle

```
PrintStyles gdcm::XMLPrinter::PrintStyle [protected]
```

The documentation for this class was generated from the following file:

- [gdcmXMLPrinter.h](#)

## 10.406 gdcm::XMLPrivateDictReader Class Reference

Class for representing a [XMLPrivateDictReader](#).

```
#include <gdcmXMLPrivateDictReader.h>
```

Inheritance diagram for gdcm::XMLPrivateDictReader:

Collaboration diagram for gdcm::XMLPrivateDictReader:

### Public Member Functions

- [XMLPrivateDictReader](#) ()
- [~XMLPrivateDictReader](#) ()
- void [CharacterDataHandler](#) (const char \*data, int length)
- void [EndElement](#) (const char \*name)
- const [PrivateDict](#) & [GetPrivateDict](#) ()
- void [StartElement](#) (const char \*name, const char \*\*atts)

### Protected Member Functions

- void [HandleDescription](#) (const char \*\*atts)
- void [HandleEntry](#) (const char \*\*atts)

### 10.406.1 Detailed Description

Class for representing a [XMLPrivateDictReader](#).

#### Note

bla Will read the Private.xml file

### 10.406.2 Constructor & Destructor Documentation

#### 10.406.2.1 XMLPrivateDictReader()

```
gdcm::XMLPrivateDictReader::XMLPrivateDictReader ( )
```

### 10.406.2.2 ~XMLPrivateDictReader()

```
gdcm::XMLPrivateDictReader::~XMLPrivateDictReader ( ) [inline]
```

## 10.406.3 Member Function Documentation

### 10.406.3.1 CharacterDataHandler()

```
void gdcm::XMLPrivateDictReader::CharacterDataHandler (
    const char * data,
    int length ) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 10.406.3.2 EndElement()

```
void gdcm::XMLPrivateDictReader::EndElement (
    const char * name ) [virtual]
```

Reimplemented from [gdcm::TableReader](#).

### 10.406.3.3 GetPrivateDict()

```
const PrivateDict & gdcm::XMLPrivateDictReader::GetPrivateDict ( ) [inline]
```

### 10.406.3.4 HandleDescription()

```
void gdcm::XMLPrivateDictReader::HandleDescription (
    const char ** atts ) [protected]
```

#### 10.406.3.5 HandleEntry()

```
void gdcM::XMLPrivateDictReader::HandleEntry (
    const char ** atts ) [protected]
```

#### 10.406.3.6 StartElement()

```
void gdcM::XMLPrivateDictReader::StartElement (
    const char * name,
    const char ** atts ) [virtual]
```

Reimplemented from [gdcM::TableReader](#).

The documentation for this class was generated from the following file:

- [gdcMXMLPrivateDictReader.h](#)



# Chapter 11

## File Documentation

### 11.1 README.txt File Reference

### 11.2 TestsList.txt File Reference

### 11.3 gdcmASN1.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmASN1.h:

#### Classes

- class [gdcm::ASN1](#)  
*Class for [ASN1](#).*

#### Namespaces

- namespace [gdcm](#)

## 11.4 gdcmASN1.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMASN1_H
15 #define GDCMASN1_H
16
17 #include "gdcmTypes.h"
18
19
20 namespace gdcm
21 {
22 //-----
23 class ASN1Internals;
24 class GDCM_EXPORT ASN1
25 {
26 public :
27     ASN1();
28     ~ASN1();
29
30     static bool ParseDumpFile(const char *filename);
31     static bool ParseDump(const char *array, size_t length);
32
33     ASN1(const ASN1&) = delete;
34     void operator=(const ASN1&) = delete;
35 protected:
36     int TestPBKDF2();
37
38 private:
39     ASN1Internals *Internals;
40 };
41 // end namespace gdcm
42 //-----
43 #endif //GDCMASN1_H

```

## 11.5 gdcmBase64.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmBase64.h:

### Classes

- class [gdcm::Base64](#)  
Class for *Base64*.

### Namespaces

- namespace [gdcm](#)

## 11.6 gdcmBase64.h

[Go to the documentation of this file.](#)

```

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2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBASE64_H
15 #define GDCMBASE64_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT Base64
22     {
23     public:
24
25         static size_t GetEncodeLength(const char *src, size_t srclen );
26
27         static size_t Encode( char *dst, size_t dlen, const char *src, size_t slen );
28
29         static size_t GetDecodeLength( const char *src, size_t len );
30
31         static size_t Decode( char *dst, size_t dlen, const char *src, size_t slen );
32
33         Base64(const Base64&) = delete;
34         void operator=(const Base64&) = delete;
35     };
36
37 } // end namespace gdcm
38
39 #endif // GDCMBASE64_H

```

## 11.7 gdcmBoxRegion.h File Reference

```
#include "gdcmRegion.h"
```

Include dependency graph for gdcmBoxRegion.h:

### Classes

- class [gdcm::BoxRegion](#)  
*Class for manipulation box region.*

### Namespaces

- namespace [gdcm](#)

## 11.8 gdcmBoxRegion.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
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9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBOXREGION_H
15 #define GDCMBOXREGION_H
16
17 #include "gdcmRegion.h"
18
19 namespace gdcm
20 {
21 class BoxRegionInternals;
22
23 //-----
24 class GDCM_EXPORT BoxRegion : public Region
25 {
26 public :
27     BoxRegion();
28     ~BoxRegion() override;
29
30     void SetDomain(unsigned int xmin, unsigned int xmax,
31                   unsigned int ymin, unsigned int ymax,
32                   unsigned int zmin, unsigned int zmax);
33
34     unsigned int GetXMin() const;
35     unsigned int GetXMax() const;
36     unsigned int GetYMin() const;
37     unsigned int GetYMax() const;
38     unsigned int GetZMin() const;
39     unsigned int GetZMax() const;
40
41     // Satisfy pure virtual parent class
42     Region *Clone() const override;
43     bool Empty() const override;
44     bool IsValid() const override;
45     size_t Area() const override;
46     BoxRegion ComputeBoundingBox() override;
47
48     void Print(std::ostream &os = std::cout) const override;
49
50     static BoxRegion BoundingBox(BoxRegion const & b1, BoxRegion const & b2 );
51
52     BoxRegion(const BoxRegion&);
53     void operator=(const BoxRegion&);
54 private:
55     BoxRegionInternals *Internals;
56 };
57
58 } // end namespace gdcm
59 //-----
60 #endif //GDCMREGION_H

```

## 11.9 gdcmByteSwap.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmSwapCode.h"
#include "gdcmByteSwap.txx"

```

Include dependency graph for gdcmByteSwap.h:

## Classes

- class `gdcm::ByteSwap< T >`  
*ByteSwap.*

## Namespaces

- namespace `gdcm`

## 11.10 gdcmByteSwap.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBYTESWAP_H
15 #define GDCMBYTESWAP_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmSwapCode.h"
19
20 namespace gdcm
21 {
22
23     template<class T>
24     class ByteSwap
25     {
26     public:
27         static bool SystemIsBigEndian ();
28         static bool SystemIsLittleEndian ();
29
30         static void Swap(T &p);
31         static void SwapFromSwapCodeIntoSystem(T &p, SwapCode const &sc);
32         static void SwapRange(T *p, unsigned int num);
33         static void SwapRangeFromSwapCodeIntoSystem(T *p, SwapCode const &sc,
34             std::streamoff num);
35
36     protected:
37         // ByteSwap() {}
38         // ~ByteSwap() {}
39
40     private:
41
42     };
43
44 } // end namespace gdcm
45
46 #include "gdcmByteSwap.txx"
47
48 #endif //GDCMBYTESWAP_H

```

## 11.11 gdcmCAPICryptoFactory.h File Reference

```
#include "gdcmCryptoFactory.h"
```

Include dependency graph for `gdcmCAPICryptoFactory.h`:

## Classes

- class [gdcm::CAPICryptoFactory](#)

## Namespaces

- namespace [gdcm](#)

## 11.12 gdcmCAPICryptoFactory.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCAPICRYPTOFACTORY_H
15 #define GDCMCAPICRYPTOFACTORY_H
16
17 #include "gdcmCryptoFactory.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT CAPICryptoFactory : public CryptoFactory
23 {
24 public:
25     CAPICryptoFactory(CryptoLib id);
26     CryptographicMessageSyntax* CreateCMSProvider();
27
28 private:
29     CAPICryptoFactory() {}
30 };
31
32 } // end namespace gdcm
33
34 #endif //GDCMCAPICRYPTOFACTORY_H

```

## 11.13 gdcmCAPICryptographicMessageSyntax.h File Reference

```

#include "gdcmCryptographicMessageSyntax.h"
#include <windows.h>
#include <wincrypt.h>
#include <vector>

```

Include dependency graph for gdcmCAPICryptographicMessageSyntax.h:

## Classes

- class [gdcm::CAPICryptographicMessageSyntax](#)

## Namespaces

- namespace `gdcm`

## 11.14 gdcmCAPICryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

1  /*****
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 *****/
14 #ifndef GDCMCAPICRYPTOGRAPHICMESSAGESYNTAX_H
15 #define GDCMCAPICRYPTOGRAPHICMESSAGESYNTAX_H
16
17 #include "gdcmCryptographicMessageSyntax.h"
18 #include <windows.h>
19 #include <wincrypt.h>
20 #include <vector>
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT CAPICryptographicMessageSyntax : public CryptographicMessageSyntax
26 {
27 public:
28     CAPICryptographicMessageSyntax();
29     ~CAPICryptographicMessageSyntax();
30
31     // X.509
32     bool ParseCertificateFile( const char *filename );
33     bool ParseKeyFile( const char *filename );
34
35     // PBE
36     bool SetPassword(const char * pass, size_t passLen);
37
38     void SetCipherType(CipherTypes type);
39
40     CipherTypes GetCipherType() const;
41
42     bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const;
43     bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const;
44
45     bool GetInitialized()const
46     {
47         return initialized;
48     }
49
50 private:
51     bool Initialize();
52     static ALG_ID GetAlgIdByObjId(const char * pszObjId);
53     const char *GetCipherObjId() const;
54     static void ReverseBytes(unsigned char* data, DWORD len);
55     static bool LoadFile(const char * filename, unsigned char* & buffer, DWORD & bufLen);
56
57 private:
58     bool initialized;
59     HCRYPTPROV hProv;
60     std::vector<PCCERT_CONTEXT> certifList;
61     HCRYPTKEY hRsaPrivK;
62     CipherTypes cipherType;
63 };
64
65 } // end namespace gdcm
66
67 #endif //GDCMCAPICRYPTOGRAPHICMESSAGESYNTAX_H

```

## 11.15 gdcmCommand.h File Reference

```
#include "gdcmSubject.h"
```

Include dependency graph for gdcmCommand.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Command](#)  
*Command superclass for callback/observer methods.*
- class [gdcm::MemberCommand< T >](#)  
*Command subclass that calls a pointer to a member function.*
- class [gdcm::SimpleMemberCommand< T >](#)  
*Command subclass that calls a pointer to a member function.*

### Namespaces

- namespace [gdcm](#)

## 11.16 gdcmCommand.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCOMMAND_H
15 #define GDCMCOMMAND_H
16
17 #include "gdcmSubject.h"
18
19 namespace gdcm
20 {
21 class Event;
22
23 class GDCM_EXPORT Command : public Subject
24 {
25 public :
26     Command(const Command&) = delete;
27     void operator=(const Command&) = delete;
28
29     virtual void Execute(Subject *caller, const Event & event ) = 0;
30
31     virtual void Execute(const Subject *caller, const Event & event ) = 0;
32
33 protected:
34     Command();
35     ~Command() override;
36 };
37
38 template <class T>
39 class MemberCommand : public Command
```



```

56 {
57 public:
58
60     typedef void (T::*TMemberFunctionPointer) (Subject*, const Event &);
61     typedef void (T::*TConstMemberFunctionPointer) (const Subject*,
62                                                     const Event &);
63
65     typedef MemberCommand      Self;
66     //typedef SmartPointer<Self> Pointer;
67
68     MemberCommand(const Self&) = delete;
69     void operator=(const Self&) = delete;
70
72     static SmartPointer<MemberCommand> New()
73     {
74         return new MemberCommand;
75     }
76
78     //gdcmTypeMacro(MemberCommand,Command);
79
82     void SetCallbackFunction(T* object,
83                             TMemberFunctionPointer memberFunction)
84     {
85         m_This = object;
86         m_MemberFunction = memberFunction;
87     }
88     void SetCallbackFunction(T* object,
89                             TConstMemberFunctionPointer memberFunction)
90     {
91         m_This = object;
92         m_ConstMemberFunction = memberFunction;
93     }
94
96     void Execute(Subject *caller, const Event & event )override
97 {
98     if( m_MemberFunction )
99     {
100         ((*m_This).*(m_MemberFunction))(caller, event);
101     }
102 }
103
105     void Execute( const Subject *caller, const Event & event )override
106 {
107     if( m_ConstMemberFunction )
108     {
109         ((*m_This).*(m_ConstMemberFunction))(caller, event);
110     }
111 }
112
113 protected:
114
115     T* m_This;
116     TMemberFunctionPointer m_MemberFunction;
117     TConstMemberFunctionPointer m_ConstMemberFunction;
118     MemberCommand():m_MemberFunction(nullptr),m_ConstMemberFunction(nullptr) {}
119     ~MemberCommand() override= default;
120
121 };
122
123 template <typename T>
124 class SimpleMemberCommand : public Command
125 {
126 public:
127
128     typedef void (T::*TMemberFunctionPointer) ();
129
130     typedef SimpleMemberCommand      Self;
131     //typedef SmartPointer<Self>      Pointer;
132
133     SimpleMemberCommand(const Self&) = delete;
134     void operator=(const Self&) = delete;
135
136     //gdcmTypeMacro(SimpleMemberCommand,Command);
137
138     static SmartPointer<SimpleMemberCommand> New()
139     {
140         return new SimpleMemberCommand;
141     }
142
143     void SetCallbackFunction(T* object,
144                             TMemberFunctionPointer memberFunction)

```

```

156     {
157         m_This = object;
158         m_MemberFunction = memberFunction;
159     }
160
161     void Execute(Subject *,const Event & )override
162 {
163     if( m_MemberFunction )
164     {
165         ((*m_This).*(m_MemberFunction)) ();
166     }
167 }
168
169 void Execute(const Subject *,const Event & )override
170 {
171     if( m_MemberFunction )
172     {
173         ((*m_This).*(m_MemberFunction)) ();
174     }
175 }
176
177 protected:
178     T* m_This;
179     TMemberFunctionPointer m_MemberFunction;
180     SimpleMemberCommand():m_This(nullptr),m_MemberFunction(nullptr) {}
181     ~SimpleMemberCommand() override = default;
182 };
183
184 } // end namespace gdcm
185 //-----
186 #endif //GDCMCOMMAND_H

```

## 11.17 gdcmCryptoFactory.h File Reference

```

#include "gdcmCryptographicMessageSyntax.h"
#include <map>

```

Include dependency graph for gdcmCryptoFactory.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::CryptoFactory](#)  
*Class to do handle the crypto factory.*

### Namespaces

- namespace [gdcm](#)

## 11.18 gdcmCryptoFactory.h

[Go to the documentation of this file.](#)

```

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2
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```

```

11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCRYPTOFACTORY_H
15 #define GDCMCRYPTOFACTORY_H
16
17 #include "gdcmCryptographicMessageSyntax.h"
18 #include <map>
19
20 namespace gdcm
21 {
22
23     class GDCM_EXPORT CryptoFactory
24     {
25     public:
26         enum CryptoLib {DEFAULT = 0, OPENSSE = 1, CAPI = 2, OPENSSELP7 = 3};
27
28         virtual CryptographicMessageSyntax* CreateCMSProvider() = 0;
29         static CryptoFactory* GetFactoryInstance(CryptoLib id = DEFAULT);
30
31     protected:
32         CryptoFactory(CryptoLib id)
33         {
34             AddLib(id, this);
35         }
36
37     private:
38         static std::map<CryptoLib, CryptoFactory*> getInstanceMap()
39         {
40             static std::map<CryptoLib, CryptoFactory*> libs;
41             return libs;
42         }
43
44         static void AddLib(CryptoLib id, CryptoFactory* f)
45         {
46             if (getInstanceMap().insert(std::pair<CryptoLib, CryptoFactory*>(id, f)).second == false)
47             {
48                 gdcmErrorMacro( "Library already registered under id " << (int)id );
49             }
50         }
51
52     protected:
53         CryptoFactory()= default;
54         ~CryptoFactory()= default;
55     };
56 } // end namespace gdcm
57
58 #endif // GDCMCRYPTOFACTORY_H

```

## 11.19 gdcmCryptographicMessageSyntax.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmCryptographicMessageSyntax.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::CryptographicMessageSyntax](#)

### Namespaces

- namespace [gdcm](#)

## 11.20 gdcmCryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCRYPTOGRAPHICMESSAGESYNTAX_H
15 #define GDCMCRYPTOGRAPHICMESSAGESYNTAX_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT CryptographicMessageSyntax
23 {
24 public:
25     CryptographicMessageSyntax() = default;
26
27     virtual ~CryptographicMessageSyntax() = default;
28     CryptographicMessageSyntax(const CryptographicMessageSyntax&) = delete;
29     void operator=(const CryptographicMessageSyntax&) = delete;
30
31     typedef enum {
32         DES3_CIPHER,    // Triple DES
33         AES128_CIPHER,  // CBC AES
34         AES192_CIPHER,  // ' '
35         AES256_CIPHER  // ' '
36     } CipherTypes;
37
38     // X.509
39     virtual bool ParseCertificateFile( const char *filename ) = 0;
40     virtual bool ParseKeyFile( const char *filename ) = 0;
41
42     // PBE
43     virtual bool SetPassword(const char * pass, size_t passLen) = 0;
44
45     virtual bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const = 0;
46     virtual bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const = 0;
47
48     virtual void SetCipherType(CipherTypes type) = 0;
49
50     virtual CipherTypes GetCipherType() const = 0;
51 };
52
53 } // end namespace gdcm
54
55 #endif //GDCMCRYPTOGRAPHICMESSAGESYNTAX_H

```

## 11.21 gdcmDataEvent.h File Reference

```
#include "gdcmEvent.h"
```

Include dependency graph for gdcmDataEvent.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::DataEvent](#)  
*DataEvent.*

## Namespaces

- namespace [gdcm](#)

## 11.22 gdcmDataEvent.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDATAEVENT_H
15 #define GDCMDATAEVENT_H
16
17 #include "gdcmEvent.h"
18
19 namespace gdcm
20 {
21
22     class DataEvent : public AnyEvent
23     {
24     public:
25         typedef DataEvent Self;
26         typedef AnyEvent Superclass;
27         DataEvent(const char *bytes = nullptr, size_t len = 0):Bytes(bytes),Length(len) {}
28         ~DataEvent() override = default;
29         DataEvent(const Self&s) : AnyEvent(s){};
30         void operator=(const Self&) = delete;
31
32         const char * GetEventName()const override { return "DataEvent"; }
33         bool CheckEvent(const ::gdcm::Event* e)const override
34         { return (dynamic_cast<const Self*>(e) == nullptr ? false : true) ; }
35         ::gdcm::Event* MakeObject()const override
36         { return new Self; }
37
38         void SetData(const char *bytes, size_t len) {
39             Bytes = bytes;
40             Length = len;
41         }
42         size_t GetDataLength()const { return Length; }
43         const char *GetData()const { return Bytes; }
44
45         //std::string GetValueAsString() const { return; }
46
47     private:
48         const char *Bytes;
49         size_t Length;
50     };
51
52 } // end namespace gdcm
53
54 #endif //GDCMDATAEVENT_H

```

## 11.23 gdcmDeflateStream.h File Reference

```
#include "zipstreamimpl.h"
```

Include dependency graph for gdcmDeflateStream.h:

## 11.24 gdcmDeflateStream.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDEFLATESTREAM_H
15 #define GDCMDEFLATESTREAM_H
16
17 #include "zipstreamimpl.h"
18
19 #endif //GDCMDEFLATESTREAM_H

```

## 11.25 gdcmDirectory.h File Reference

```

#include "gdcmTypes.h"
#include <string>
#include <vector>
#include <iostream>
#include <assert.h>

```

Include dependency graph for gdcmDirectory.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Directory](#)  
*Class for manipulation directories.*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Directory &d)`

## 11.26 gdcmDirectory.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDIRECTORY_H
15 #define GDCMDIRECTORY_H
16
17 #include "gdcmTypes.h"
18
19 #include <string>
20 #include <vector>
21 #include <iostream>
22 #include <assert.h>
23
24 namespace gdcm
25 {
26 //-----
27 class GDCM_EXPORT Directory
28 {
29     friend std::ostream& operator<<(std::ostream &_os, const Directory &d);
30 public:
31     Directory() = default;
32     ~Directory() = default;
33     typedef std::string FilenameType;
34     typedef std::vector<FilenameType> FilenamesType;
35
36     void Print(std::ostream &os = std::cout) const;
37
38     FilenameType const &GetToplevel()const { return Toplevel; }
39
40     FilenamesType const &GetFilenames()const {
41         assert( !Toplevel.empty() ) && "Need to call Explore first" ;
42         return Filenames; }
43
44     FilenamesType const &GetDirectories()const { return Directories; }
45
46     unsigned int Load(FilenameType const &name, bool recursive = false);
47
48     // \todo later: GLOB
49     // The glob() function searches for all the pathnames matching pattern according to
50     // the rules used by the shell (see glob(7)). No tilde expansion or parameter
51     // substitution is done; if you want these, use wordexp(3).
52     // int Glob(...);
53
54 protected:
55     unsigned int Explore(FilenameType const &name, bool recursive);
56
57 private:
58     FilenamesType Filenames;
59     FilenamesType Directories;
60
61     FilenameType Toplevel;
62 };
63 //-----
64 inline std::ostream& operator<<(std::ostream &os, const Directory &d)
65 {
66     d.Print( os );
67     return os;
68 }
69
70 } // end namespace gdcm
71 //-----
72 #endif //GDCMDIRECTORY_H

```

## 11.27 gdcmDummyValueGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDummyValueGenerator.h:

### Classes

- class [gdcm::DummyValueGenerator](#)  
*Class for generating dummy value.*

### Namespaces

- namespace [gdcm](#)

## 11.28 gdcmDummyValueGenerator.h

[Go to the documentation of this file.](#)

```
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDUMMYVALUEGENERATOR_H
15 #define GDCMDUMMYVALUEGENERATOR_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT DummyValueGenerator
23     {
24     public:
25         static const char* Generate(const char *input);
26
27     private:
28     };
29
30 } // end namespace gdcm
31
32 #endif //GDCMDUMMYVALUEGENERATOR_H
```

## 11.29 gdcmEvent.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmEvent.h: This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::AbortEvent](#)
- class [gdcm::AnyEvent](#)
- class [gdcm::EndEvent](#)
- class [gdcm::Event](#)  
*superclass for callback/observer methods*
- class [gdcm::ExitEvent](#)
- class [gdcm::InitializeEvent](#)
- class [gdcm::IterationEvent](#)
- class [gdcm::ModifiedEvent](#)
- class [gdcm::NoEvent](#)
- class [gdcm::StartEvent](#)
- class [gdcm::UserEvent](#)

## Namespaces

- namespace [gdcm](#)

## Macros

- `#define gdcmEventMacro(classname, super)`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, Event &e)`  
*Generic inserter operator for [Event](#) and its subclasses.*

### 11.29.1 Macro Definition Documentation

#### 11.29.1.1 gdcmEventMacro

```
#define gdcmEventMacro(  
    classname,  
    super )
```

#### Value:

```
\  
class classname : public super { \  
public: \  
    typedef classname Self; \  
    typedef super Superclass; \  
    classname() {} \  
    virtual ~classname() override = default; \  
    virtual const char * GetEventName()const override { return #classname; } \  
    virtual bool CheckEvent(const ::gdcm::Event* e) const override \  
    { return dynamic_cast<const Self*>(e) ? true : false; } \  
    virtual ::gdcm::Event* MakeObject() const override \  
    { return new Self; } \  
    classname(const Self&s) : super(s){}; \  
private: \  
    void operator=(const Self&); \  
}
```

## 11.30 gdcmEvent.h

[Go to the documentation of this file.](#)

```

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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMEVENT_H
15 #define GDCMEVENT_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21 //-----
22 class GDCM_EXPORT Event
23 {
24 public :
25     Event();
26     virtual ~Event();
27     Event(const Event&);
28     void operator=(const Event&) = delete;
29
30     virtual Event* MakeObject() const = 0;
31
32     virtual void Print(std::ostream& os) const;
33
34     virtual const char * GetEventName() const = 0;
35
36     virtual bool CheckEvent(const Event*) const = 0;
37 };
38
39 inline std::ostream& operator<<(std::ostream& os, Event &e)
40 {
41     e.Print(os);
42     return os;
43 }
44
45 /*
46 * Macro for creating new Events
47 */
48 #define gdcmEventMacro( classname , super ) \
49 \
50 class classname : public super { \
51 public: \
52     typedef classname Self; \
53     typedef super Superclass; \
54     classname() {} \
55     virtual ~classname() override = default; \
56     virtual const char * GetEventName() const override { return #classname; } \
57     virtual bool CheckEvent(const ::gdcm::Event* e) const override \
58     { return dynamic_cast<const Self*>(e) ? true : false; } \
59     virtual ::gdcm::Event* MakeObject() const override \
60     { return new Self; } \
61     classname(const Self&s) : super(s){}; \
62 private: \
63     void operator=(const Self&); \
64 }
65
66 gdcmEventMacro( NoEvent , Event );
67 gdcmEventMacro( AnyEvent , Event );
68 gdcmEventMacro( StartEvent , AnyEvent );
69 gdcmEventMacro( EndEvent , AnyEvent );
70 //gdcmEventMacro( ProgressEvent , AnyEvent );
71 gdcmEventMacro( ExitEvent , AnyEvent );
72 gdcmEventMacro( AbortEvent , AnyEvent );
73 gdcmEventMacro( ModifiedEvent , AnyEvent );
74 gdcmEventMacro( InitializeEvent , AnyEvent );
75 gdcmEventMacro( IterationEvent , AnyEvent );

```

```

92 //gdcmEventMacro( AnonymizeEvent      , AnyEvent );
93 gdcmEventMacro( UserEvent              , AnyEvent );
94
95
96 } // end namespace gdcm
97 //-----
98 #endif //GDCMEVENT_H

```

## 11.31 gdcmException.h File Reference

```

#include <cassert>
#include <cstdlib>
#include <exception>
#include <sstream>
#include <stdexcept>
#include <string>

```

Include dependency graph for gdcmException.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Exception](#)  
*Exception.*

### Namespaces

- namespace [gdcm](#)

## 11.32 gdcmException.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMEXCEPTION_H
15 #define GDCMEXCEPTION_H
16
17 #include <cassert>
18 #include <cstdlib> // NULL
19 #include <exception>
20 #include <sstream> // ostringstream
21 #include <stdexcept> // logic_error
22 #include <string>
23
24 // Disable clang warning "dynamic exception specifications are deprecated".
25 // We need to be C++03 and C++11 compatible, and if we remove the 'throw()'
26 // specifier we'll get an error in C++03 by not matching the superclass.
27 #if defined(__clang__) && defined(__has_warning)

```

```

28 # if __has_warning("-Wdeprecated")
29 #   pragma clang diagnostic push
30 #   pragma clang diagnostic ignored "-Wdeprecated"
31 # endif
32 #endif
33
34 namespace gdcm
35 {
36
43 class Exception : public std::exception
44 {
45     typedef std::logic_error StringHolder;
46
47     static StringHolder CreateWhat(const char* const desc,
48                                   const char* const file,
49                                   const unsigned int lineNumber,
50                                   const char* const func)
51     {
52         assert(desc != nullptr);
53         assert(file != nullptr);
54         assert(func != nullptr);
55         std::ostringstream oswhat;
56         oswhat << file << ":" << lineNumber << " (" << func << "):\n";
57         oswhat << desc;
58         return StringHolder( oswhat.str() );
59     }
60
61 public:
62     explicit Exception(const char *desc = "None",
63                       const char *file = __FILE__,
64                       unsigned int lineNumber = __LINE__,
65                       // FIXME: __PRETTY_FUNCTION__ is the non-mangled version for __GNUC__ compiler
66                       const char *func = "" /*__FUNCTION__*/)
67     :
68       What( CreateWhat(desc, file, lineNumber, func) ),
69       Description(desc)
70     {
71     }
72
73     ~Exception() throw() override {}
74
75     const char* what() const throw() override
76     {
77         return What.what();
78     }
79
80     const char * GetDescription()const { return Description.what(); }
81
82 private:
83     StringHolder What;
84     StringHolder Description;
85 };
86
87 } // end namespace gdcm
88
89 // Undo warning suppression.
90 #if defined(__clang__) && defined(__has_warning)
91 # if __has_warning("-Wdeprecated")
92 #   pragma clang diagnostic pop
93 # endif
94 #endif
95
96 #endif

```

## 11.33 gdcmFilename.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <string>
```

Include dependency graph for gdcmFilename.h:

### Classes

- class [gdcm::Filename](#)

*Class to manipulate file name's.*

## Namespaces

- namespace `gdcm`

## 11.34 gdcmFilename.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILENAME_H
15 #define GDCMFILENAME_H
16
17 #include "gdcmTypes.h"
18
19 #include <string>
20
21 namespace gdcm
22 {
23     class GDCM_EXPORT Filename
24     {
25     public:
26         Filename(const char* filename = ""):FileName(filename ? filename : ""),Path(),Conversion() {}
27
28         const char *GetFileName()const { return FileName.c_str(); }
29         const char *GetPath();
30         const char *GetName();
31         const char *GetExtension();
32         const char *ToUnixSlashes();
33         const char *ToWindowsSlashes();
34
35         static const char *Join(const char *path, const char *filename);
36
37         bool IsEmpty()const { return FileName.empty(); }
38
39         operator const char * () const { return GetFileName(); }
40
41         // FIXME: I don't like this function
42         // It hides the realpath call (maybe useful)
43         // and it forces file to exist on the disk whereas Filename
44         // should be independent from file existence.
45         bool IsIdentical(Filename const &fn) const;
46
47         bool EndWith(const char ending[]) const;
48
49     private:
50         std::string FileName;
51         std::string Path;
52         std::string Conversion;
53     };
54 } // end namespace gdcm
55
56 #endif //GDCMFILENAME_H

```

## 11.35 gdcmFileNameEvent.h File Reference

```
#include "gdcmEvent.h"
```

```
#include "gdcmTag.h"
```

Include dependency graph for gdcmFileNameEvent.h:

### Classes

- class [gdcm::FileNameEvent](#)  
*FileNameEvent.*

### Namespaces

- namespace [gdcm](#)

## 11.36 gdcmFileNameEvent.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILENAMEEVENT_H
15 #define GDCMFILENAMEEVENT_H
16
17 #include "gdcmEvent.h"
18 #include "gdcmTag.h"
19
20 namespace gdcm
21 {
22
23 class FileNameEvent : public AnyEvent
24 {
25 public:
26     typedef FileNameEvent Self;
27     typedef AnyEvent Superclass;
28     FileNameEvent(const char *s = "") : m_FileName(s) {}
29     ~FileNameEvent() override = default;
30
31     FileNameEvent(const Self&s) : AnyEvent(s){};
32     void operator=(const Self&) = delete;
33
34     const char * GetEventName()const override { return "FileNameEvent"; }
35     bool CheckEvent(const ::gdcm::Event* e)const override
36     { return dynamic_cast<const Self*>(e) ? true : false; }
37     ::gdcm::Event* MakeObject()const override
38     { return new Self; }
39
40     void SetFileName(const char *f) { m_FileName = f; }
41     const char *GetFileName()const { return m_FileName.c_str(); }
42 private:
43     std::string m_FileName;
44 };
45
46 } // end namespace gdcm
47
48 #endif //GDCMFILENAMEEVENT_H
```

## 11.37 gdcmFilenameGenerator.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <string>
```

```
#include <vector>
```

Include dependency graph for gdcmFilenameGenerator.h:

### Classes

- class [gdcm::FilenameGenerator](#)  
*FilenameGenerator.*

### Namespaces

- namespace [gdcm](#)

## 11.38 gdcmFilenameGenerator.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILENAMEGENERATOR_H
15 #define GDCMFILENAMEGENERATOR_H
16
17 #include "gdcmTypes.h"
18 #include <string>
19 #include <vector>
20
21
22 namespace gdcm
23 {
24
25     class GDCM_EXPORT FilenameGenerator
26     {
27     public:
28         FilenameGenerator():Pattern(),Prefix(),FileNames() {}
29         ~FilenameGenerator() = default;
30         // FIXME: already defines in gdcm::Directory
31         typedef std::string FilenameType;
32         typedef std::vector<FilenameType> FileNamesType;
33         typedef FileNamesType::size_type SizeType;
34
35         void SetPattern(const char *pattern) { Pattern = pattern; }
36         const char *GetPattern()const { return Pattern.c_str(); }
37
38         void SetPrefix(const char *prefix) { Prefix = prefix; }
39         const char *GetPrefix()const { return Prefix.c_str(); }
40
41         bool Generate();
42
43         void SetNumberOfFileNames(SizeType nfiles);
44         SizeType GetNumberOfFileNames() const;
```

```

60
61  const char * GetFilename(SizeType n) const;
62
63
64  FilenamesType const & GetFileNames()const { assert( !Pattern.empty() ); return Filenames; }
65
66 private:
67  FilenameType Pattern;
68  FilenameType Prefix;
69  FilenamesType Filenames;
70 };
71
72 } // end namespace gdcm
73
74 #endif //GDCMFILENAMEGENERATOR_H

```

## 11.39 gdcmLegacyMacro.h File Reference

```

#include "gdcmException.h"
#include "gdcmTrace.h"

```

Include dependency graph for gdcmLegacyMacro.h: This graph shows which files directly or indirectly include this file:

### Macros

- #define [GDCM\\_LEGACY](#)(method) method;
- #define [GDCM\\_LEGACY\\_BODY](#)(method, version) [gdcmWarningMacro](#)(#method " was deprecated for " version " and will be removed in a future version.")
- #define [GDCM\\_LEGACY\\_REPLACED\\_BODY](#)(method, version, replace) [gdcmWarningMacro](#)(#method " was deprecated for " version " and will be removed in a future version. Use " #replace " instead.")
- #define [GDCM\\_NOOP\\_STATEMENT](#) static\_assert(true, "")

### 11.39.1 Macro Definition Documentation

#### 11.39.1.1 GDCM\_LEGACY

```

#define GDCM_LEGACY(
    method ) method;

```

#### 11.39.1.2 GDCM\_LEGACY\_BODY

```

#define GDCM_LEGACY_BODY(
    method,
    version ) gdcmWarningMacro(#method " was deprecated for " version " and will be
removed in a future version.")

```



### 11.39.1.3 GDCM\_LEGACY\_REPLACED\_BODY

```
#define GDCM_LEGACY_REPLACED_BODY(
    method,
    version,
    replace )   gdcmWarningMacro(#method " was deprecated for " version " and will be
removed in a future version.  Use " #replace " instead.")
```

### 11.39.1.4 GDCM\_NOOP\_STATEMENT

```
#define GDCM_NOOP_STATEMENT static_assert(true, "")
```

The `static_assert(true, "")` idiom is commonly employed for C++11 or greater to ensure that it is compile-time only check that can not be part of the binary file. This allows a macro to be used anywhere that a statement is expected, and to enforce consistent use of ; after a macro. The `static_assert` is a `constexpr` that can be used in places where raw statements (i.e. `'do{} while(0)'`) are not allowed (i.e. after class member function definitions).

## 11.40 gdcmLegacyMacro.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMLEGACYMACRO_H
15 #define GDCMLEGACYMACRO_H
16
17 #if !defined(GDCMTYPES_H) && !defined(SWIG)
18 #error you need to include gdcmTypes.h instead
19 #endif
20
21 #include "gdcmException.h"
22
23 //-----
24 // Setup legacy code policy.
25
26 // Define GDCM_LEGACY macro to mark legacy methods where they are
27 // declared in their class.      Example usage:
28 //
29 //      // @deprecated Replaced by MyOtherMethod() as of GDCM 2.0.
30 //      GDCM_LEGACY(void MyMethod());
31 #if defined(GDCM_LEGACY_REMOVE)
32 # define GDCM_LEGACY(method)
33 #elif defined(GDCM_LEGACY_SILENT) || defined(SWIG)
34 // Provide legacy methods with no warnings.
35 # define GDCM_LEGACY(method) method;
36 #else
37 // Setup compile-time warnings for uses of deprecated methods if
38 // possible on this compiler.
39 # if defined(__GNUC__) && !defined(__INTEL_COMPILER) && (__GNUC__ > 3 || (__GNUC__ == 3 && __GNUC_MINOR__ >=
40 1))
41 #   define GDCM_LEGACY(method) method __attribute__((deprecated));
```

```

41 # elif defined(_MSC_VER) && _MSC_VER >= 1300
42 #   define GDCM_LEGACY(method) __declspec(deprecated) method;
43 # else
44 #   define GDCM_LEGACY(method) method;
45 # endif
46 #endif
47
48 # define GDCM_NOOP_STATEMENT static_assert(true, "")
49
50 // Macros to create runtime deprecation warning messages in function
51 // bodies. Example usage:
52 //
53 //   #if !defined(GDCM_LEGACY_REMOVE)
54 //   void gdcm::MyClass::MyOldMethod()
55 //   {
56 //       GDCM_LEGACY_BODY(gdcm::MyClass::MyOldMethod, "GDCM 2.0");
57 //   }
58 //   #endif
59 //
60 //   #if !defined(GDCM_LEGACY_REMOVE)
61 //   void gdcm::MyClass::MyMethod()
62 //   {
63 //       GDCM_LEGACY_REPLACED_BODY(gdcm::MyClass::MyMethod, "GDCM 2.0",
64 //                                gdcm::MyClass::MyOtherMethod);
65 //   }
66 //   #endif
67
68 #if defined(GDCM_LEGACY_REMOVE) || defined(GDCM_LEGACY_SILENT)
69 # define GDCM_LEGACY_BODY(method, version)
70 # define GDCM_LEGACY_REPLACED_BODY(method, version, replace)
71 #else
72 # define GDCM_LEGACY_BODY(method, version) \
73 gdcmWarningMacro(#method " was deprecated for " version " and will be removed in a future version.")
74 # define GDCM_LEGACY_REPLACED_BODY(method, version, replace) \
75 gdcmWarningMacro(#method " was deprecated for " version " and will be removed in a future version. Use "
76 #replace " instead.")
77 #endif
78
79 #include "gdcmTrace.h"
80
81 #endif // GDCM_LEGACYMACRO_H

```

## 11.41 gdcmMD5.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmMD5.h:

### Classes

- class [gdcm::MD5](#)  
Class for *MD5*.

### Namespaces

- namespace [gdcm](#)

## 11.42 gdcmMD5.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMD5_H
15 #define GDCMMD5_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21 //-----
22 class GDCM_EXPORT MD5
23 {
24 public :
25     // Compute md5 from memory pointed by 'pointer' of size 'buf_len'
26     static bool Compute(const char *buffer, size_t buf_len, char digest_str[33]);
27
28     static bool ComputeFile(const char *filename, char digest_str[33]);
29 };
30 // end namespace gdcm
31 //-----
32 #endif //GDCMMD5_H

```

## 11.43 gdcmObject.h File Reference

```

#include "gdcmTypes.h"
#include <assert.h>
#include <iostream>

```

Include dependency graph for gdcmObject.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Object](#)  
*Object.*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Object &obj)`

## 11.44 gdcmObject.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMOBJECT_H
15 #define GDCMOBJECT_H
16
17 #include "gdcmTypes.h"
18
19 #include <assert.h>
20 #include <iostream> // grrrr
21
22 //namespace std { class ostream; }
23 namespace gdcm
24 {
25
26 template<class ObjectType> class SmartPointer;
27
28 class GDCM_EXPORT Object
29 {
30     template <class ObjectType> friend class SmartPointer;
31     friend std::ostream& operator<<(std::ostream &os, const Object &obj);
32
33 public:
34     Object():ReferenceCount(0) {}
35
36     // Implementation note:
37     // If I move ~Object in the protected section I can prevent people
38     // from writing:
39     // SmartPointer<Object> p = new Object;
40     // delete p; // due to SmartPointer::operator ObjectType * () const
41     // but on the other hand one could not define an Object on the stack
42     // Object obj;
43     // Furthermore it would not prevent anyone from doing:
44     // class MyObject : public Object {};
45     // SmartPointer<MyObject> o = new MyObject;
46     // delete o; // grrrrrr
47     virtual ~Object() {
48         // If your debugger reach here it means you are doing something silly
49         // like using SmartPointer on object allocated on the stack (vs heap)
50         assert(ReferenceCount == 0);
51     }
52
53     // http://www.parashift.com/c++-faq-lite/freestore-mgmt.html#faq-16.24
54     // Set the ref count to 0
55     // Do NOT copy the reference count !
56     Object(const Object&):ReferenceCount(0){}
57     void operator=(const Object&){}
58
59     //static Object* New() { return new Object; }
60
61 protected:
62     // For the purpose of the invasive SmartPointer implementation
63     void Register() {
64         ReferenceCount++;
65         assert( ReferenceCount > 0 );
66     }
67     void UnRegister() {
68         assert( ReferenceCount > 0 );
69         ReferenceCount--;
70         if (!ReferenceCount)
71         {
72             delete this;
73         }
74     }
75
76 public:

```

```

86 // For dealing with printing of object and polymorphism
87 virtual void Print(std::ostream &)const {}
88
89 private:
90     long ReferenceCount;
91 };
92
93 //-----
94 // function do not carry vtable. Thus define in the base class the operator
95 // and use the member function ->Print() to call the appropriate function
96 // NOTE: All subclass of Object needs to implement the Print function
97 inline std::ostream& operator<<(std::ostream &os, const Object &obj)
98 {
99     obj.Print(os);
100     return os;
101 }
102
103 } // end namespace gdcm
104
105 #endif //GDCMOBJECT_H

```

## 11.45 gdcmOpenSSLCryptoFactory.h File Reference

```

#include "gdcmCryptoFactory.h"
#include "gdcmOpenSSLCryptographicMessageSyntax.h"

```

Include dependency graph for gdcmOpenSSLCryptoFactory.h:

### Classes

- class [gdcm::OpenSSLCryptoFactory](#)

### Namespaces

- namespace [gdcm](#)

## 11.46 gdcmOpenSSLCryptoFactory.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMOPENSSLCRYPTOFACTORY_H
15 #define GDCMOPENSSLCRYPTOFACTORY_H
16
17 #include "gdcmCryptoFactory.h"
18 #include "gdcmOpenSSLCryptographicMessageSyntax.h"
19
20 namespace gdcm
21 {
22

```

```

23 class GDCM_EXPORT OpenSSLCryptoFactory : public CryptoFactory
24 {
25 public:
26     OpenSSLCryptoFactory(CryptoLib id) : CryptoFactory(id)
27     {
28         gdcmDebugMacro( "OpenSSL Factory registered." );
29     }
30
31 public:
32     CryptographicMessageSyntax* CreateCMSProvider()
33     {
34         InitOpenSSL();
35         return new OpenSSLCryptographicMessageSyntax();
36     }
37
38 protected:
39     void InitOpenSSL();
40
41 private:
42     OpenSSLCryptoFactory(){}
43 };
44
45 } // end namespace gdcm
46
47 #endif //GDCMOPENSLLCRYPTOFACTORY_H

```

## 11.47 gdcmOpenSSLCryptographicMessageSyntax.h File Reference

```

#include "gdcmCryptographicMessageSyntax.h"
#include <openssl/cms.h>
#include <openssl/evp.h>

```

Include dependency graph for gdcmOpenSSLCryptographicMessageSyntax.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::OpenSSLCryptographicMessageSyntax](#)

### Namespaces

- namespace [gdcm](#)

## 11.48 gdcmOpenSSLCryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMOPENSLLCRYPTOGRAPHICMESSAGESYNTAX_H

```

```

15 #define GDCMOPENSSLCRYPTOGRAPHICMESSAGESYNTAX_H
16
17 #include "gdcmCryptographicMessageSyntax.h"
18 #include <openssl/cms.h>
19 #include <openssl/evp.h>
20
21 namespace gdcmm
22 {
23
24 class GDCM_EXPORT OpenSSLCryptographicMessageSyntax : public CryptographicMessageSyntax
25 {
26 public:
27     OpenSSLCryptographicMessageSyntax();
28     ~OpenSSLCryptographicMessageSyntax();
29
30     // X.509
31     bool ParseCertificateFile( const char *filename );
32     bool ParseKeyFile( const char *filename );
33
34     // PBE
35     bool SetPassword(const char * pass, size_t passLen);
36
37     void SetCipherType(CipherTypes type);
38     CipherTypes GetCipherType() const;
39     bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const;
40     bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const;
41
42 private:
43     // #ifdef GDCM_HAVE_CMS_RECIPIENT_PASSWORD
44     //     ::stack_st_X509 *recips;
45     // #else
46     STACK_OF(X509) *recips;
47     // #endif
48     ::EVP_PKEY *pkey;
49     const EVP_CIPHER *internalCipherType;
50     char * password;
51     size_t passwordLength;
52     CipherTypes cipherType;
53
54 private:
55     OpenSSLCryptographicMessageSyntax(const OpenSSLCryptographicMessageSyntax&); // Not implemented.
56     void operator=(const OpenSSLCryptographicMessageSyntax&); // Not implemented.
57     const EVP_CIPHER *CreateCipher( CryptographicMessageSyntax::CipherTypes ciphertype);
58
59 };
60
61 // end namespace gdcmm
62
63 #endif //GDCMOPENSSLCRYPTOGRAPHICMESSAGESYNTAX_H

```

## 11.49 gdcmmOpenSSLP7CryptoFactory.h File Reference

```

#include "gdcmCryptoFactory.h"
#include "gdcmmOpenSSLP7CryptographicMessageSyntax.h"

```

Include dependency graph for gdcmmOpenSSLP7CryptoFactory.h:

### Classes

- class [gdcmm::OpenSSLP7CryptoFactory](#)

### Namespaces

- namespace [gdcmm](#)

## 11.50 gdcmOpenSSLP7CryptoFactory.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMOPENSSLP7CRYPTOFACTORY_H
15 #define GDCMOPENSSLP7CRYPTOFACTORY_H
16
17 #include "gdcmCryptoFactory.h"
18 #include "gdcmOpenSSLP7CryptographicMessageSyntax.h"
19
20 namespace gdcm
21 {
22 class GDCM_EXPORT OpenSSLP7CryptoFactory : public CryptoFactory
23 {
24 public:
25     OpenSSLP7CryptoFactory(CryptoLib id) : CryptoFactory(id)
26     {
27         gdcmDebugMacro( "OpenSSL (PKCS7) Factory registered." );
28     }
29
30 public:
31     CryptographicMessageSyntax* CreateCMSProvider()
32     {
33         return new OpenSSLP7CryptographicMessageSyntax();
34     }
35
36 private:
37     OpenSSLP7CryptoFactory() {}
38 };
39 }
40
41 #endif //GDCMOPENSSLP7CRYPTOFACTORY_H

```

## 11.51 gdcmOpenSSLP7CryptographicMessageSyntax.h File Reference

```

#include "gdcmCryptographicMessageSyntax.h"
#include "gdcmTypes.h"

```

Include dependency graph for gdcmOpenSSLP7CryptographicMessageSyntax.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::OpenSSLP7CryptographicMessageSyntax](#)

### Namespaces

- namespace [gdcm](#)



## 11.52 gdcmOpenSSL7CryptographicMessageSyntax.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMOPENSSL7CRYPTOGRAPHICMESSAGESYNTAX_H
15 #define GDCMOPENSSL7CRYPTOGRAPHICMESSAGESYNTAX_H
16
17 #include "gdcmCryptographicMessageSyntax.h"
18 #include "gdcmTypes.h"
19
20 namespace gdcm
21 {
22 class CryptographicMessageSyntaxInternals;
23 //-----
24
25 class GDCM_EXPORT OpenSSL7CryptographicMessageSyntax : public CryptographicMessageSyntax
26 {
27 public:
28     OpenSSL7CryptographicMessageSyntax();
29     ~OpenSSL7CryptographicMessageSyntax();
30
31     // X.509
32     bool ParseCertificateFile( const char *filename );
33     bool ParseKeyFile( const char *filename );
34
35     // PBE
36     bool SetPassword(const char * /*pass*/, size_t /*passLen*/)
37     {
38         gdcmWarningMacro( "Openssl using PKCS7 does not support Password Based Encryption." );
39         return false;
40     }
41
42     void SetCipherType(CipherTypes type);
43     CipherTypes GetCipherType() const;
44
45     bool Encrypt(char *output, size_t &outlen, const char *array, size_t len) const;
46     bool Decrypt(char *output, size_t &outlen, const char *array, size_t len) const;
47
48 private:
49     CryptographicMessageSyntaxInternals *Internals;
50 private:
51     OpenSSL7CryptographicMessageSyntax(const OpenSSL7CryptographicMessageSyntax&); // Not implemented.
52     void operator=(const OpenSSL7CryptographicMessageSyntax&); // Not implemented.
53 };
54 // end namespace gdcm
55 //-----
56 #endif //GDCMOPENSSL7CRYPTOGRAPHICMESSAGESYNTAX_H

```

## 11.53 gdcmProgressEvent.h File Reference

```

#include "gdcmEvent.h"
#include "gdcmTag.h"

```

Include dependency graph for gdcmProgressEvent.h:

### Classes

- class `gdcm::ProgressEvent`  
*ProgressEvent.*

## Namespaces

- namespace `gdcm`

## 11.54 gdcmProgressEvent.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPROGRESSEVENT_H
15 #define GDCMPROGRESSEVENT_H
16
17 #include "gdcmEvent.h"
18 #include "gdcmTag.h"
19
20 namespace gdcm
21 {
22
23 class ProgressEvent : public AnyEvent
24 {
25 public:
26     typedef ProgressEvent Self;
27     typedef AnyEvent Superclass;
28     ProgressEvent(double p = 0):m_Progress(p) {}
29     ~ProgressEvent() override = default;
30
31     ProgressEvent(const Self&s) : AnyEvent(s){};
32     void operator=(const Self&) = delete;
33
34     const char * GetEventName()const override { return "ProgressEvent"; }
35     bool CheckEvent(const ::gdcm::Event* e)const override
36     { return dynamic_cast<const Self*>(e) ? true : false; }
37     ::gdcm::Event* MakeObject()const override
38     { return new Self; }
39
40     void SetProgress(double p) { m_Progress = p; }
41     double GetProgress()const { return m_Progress; }
42 private:
43     double m_Progress;
44 };
45
46 } // end namespace gdcm
47
48 #endif //GDCMPROGRESSEVENT_H

```

## 11.55 gdcmRegion.h File Reference

```

#include "gdcmTypes.h"
#include <vector>
#include <iostream>

```

Include dependency graph for `gdcmRegion.h`: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::Region](#)  
*Class for manipulation region.*

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const Region &r)

## 11.56 gdcmRegion.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMREGION_H
15 #define GDCMREGION_H
16
17 #include "gdcmTypes.h"
18 #include <vector>
19 #include <iostream>
20
21 namespace gdcm
22 {
23 class BoxRegion;
24
25 //-----
26 class GDCM_EXPORT Region
27 {
28 public:
29     Region();
30     virtual ~Region();
31
32     virtual void Print(std::ostream &os = std::cout) const;
33
34     virtual bool Empty() const = 0;
35
36     virtual bool IsValid() const = 0;
37
38     virtual size_t Area() const = 0;
39
40     // implementation detail of heterogeneous container in C++
41     virtual Region *Clone() const = 0;
42
43     virtual BoxRegion ComputeBoundingBox() = 0;
44 private:
45 };
46 //-----
47 inline std::ostream& operator<<(std::ostream &os, const Region&r)
48 {
49     r.Print( os );
50     return os;
51 }
52
53 } // end namespace gdcm
54 //-----
55 #endif //GDCMREGION_H

```

## 11.57 gdcmSHA1.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSHA1.h:

### Classes

- class [gdcm::SHA1](#)  
*Class for [SHA1](#).*

### Namespaces

- namespace [gdcm](#)

## 11.58 gdcmSHA1.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSHA1_H
15 #define GDCMSHA1_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21 //-----
22 class SHA1Internals;
23 class GDCM_EXPORT SHA1
24 {
25 public :
26     SHA1();
27     ~SHA1();
28     SHA1(const SHA1&) = delete;
29     void operator=(const SHA1&) = delete;
30
31     static bool Compute(const char *buffer, unsigned long buf_len, char digest_str[20*2+1]);
32     static bool ComputeFile(const char *filename, char digest_str[20*2+1]);
33
34 private:
35     SHA1Internals *Internals;
36 };
37 } // end namespace gdcm
38 //-----
39 #endif //GDCMSHA1_H
```

## 11.59 gdcmSmartPointer.h File Reference

```
#include "gdcmObject.h"
```

Include dependency graph for gdcmSmartPointer.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::SmartPointer< ObjectType >](#)  
*Class for Smart Pointer.*

### Namespaces

- namespace [gdcm](#)

## 11.60 gdcmSmartPointer.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSMARTPOINTER_H
15 #define GDCMSMARTPOINTER_H
16
17 #include "gdcmObject.h"
18
19 namespace gdcm
20 {
21
22 template<class ObjectType>
23 class SmartPointer
24 {
25 public:
26     SmartPointer():Pointer(nullptr) {}
27     SmartPointer(const SmartPointer<ObjectType>& p):Pointer(p.Pointer)
28     { Register(); }
29     SmartPointer(ObjectType* p):Pointer(p)
30     { Register(); }
31     SmartPointer(ObjectType const & p)
32     {
33         Pointer = const_cast<ObjectType*>(&p);
34         Register();
35     }
36     ~SmartPointer() {
37         UnRegister();
38         Pointer = nullptr;
39     }
40
41     ObjectType *operator -> () const
42     { return Pointer; }
43
44     ObjectType& operator * () const
45     {
46         assert( Pointer );
47         return *Pointer;
48     }
49 }
```

```

65     }
66
67     operator ObjectType * () const
68     { return Pointer; }
69
70
71     SmartPointer &operator = (SmartPointer const &r)
72     { return operator = (r.Pointer); }
73
74
75     SmartPointer &operator = (ObjectType *r)
76     {
77         // http://www.parashift.com/c++-faq-lite/freestore-mgmt.html#faq-16.22
78         // DO NOT CHANGE THE ORDER OF THESE STATEMENTS!
79         // (This order properly handles self-assignment)
80         // (This order also properly handles recursion, e.g., if a ObjectType contains SmartPointer<ObjectType>s)
81         if( Pointer != r )
82         {
83             ObjectType* old = Pointer;
84             Pointer = r;
85             Register();
86             if ( old ) { old->UnRegister(); }
87         }
88         return *this;
89     }
90
91
92     SmartPointer &operator = (ObjectType const &r)
93     {
94         ObjectType* tmp = const_cast<ObjectType*>(&r);
95         return operator = (tmp);
96     }
97
98     ObjectType *GetPointer()const
99     { return Pointer; }
100
101 private:
102     void Register()
103     {
104         if(Pointer) Pointer->Register();
105     }
106
107     void UnRegister()
108     {
109         if(Pointer) Pointer->UnRegister();
110     }
111
112     ObjectType* Pointer;
113 };
114
115 } // end namespace gdcm
116
117 #endif //GDCMSMARTPOINTER_H

```

## 11.61 gdcmStaticAssert.h File Reference

This graph shows which files directly or indirectly include this file:

### Classes

- struct [gdcm::static\\_assert\\_test< x >](#)
- struct [gdcm::STATIC\\_ASSERTION\\_FAILURE< true >](#)

### Namespaces

- namespace [gdcm](#)

## Macros

- #define [GDCM\\_DO\\_JOIN](#)(X, Y) [GDCM\\_DO\\_JOIN2](#)(X,Y)
- #define [GDCM\\_DO\\_JOIN2](#)(X, Y) X##Y
- #define [GDCM\\_JOIN](#)(X, Y) [GDCM\\_DO\\_JOIN](#)( X, Y )
- #define [GDCM\\_STATIC\\_ASSERT](#)(B)

*The GDCM\_JOIN + **LINE** is needed to create a uniq identifier.*

### 11.61.1 Macro Definition Documentation

#### 11.61.1.1 GDCM\_DO\_JOIN

```
#define GDCM_DO_JOIN(  
    X,  
    Y ) GDCM\_DO\_JOIN2 (X, Y)
```

#### 11.61.1.2 GDCM\_DO\_JOIN2

```
#define GDCM_DO_JOIN2(  
    X,  
    Y ) X##Y
```

#### 11.61.1.3 GDCM\_JOIN

```
#define GDCM_JOIN(  
    X,  
    Y ) GDCM\_DO\_JOIN ( X, Y )
```

#### 11.61.1.4 GDCM\_STATIC\_ASSERT

```
#define GDCM_STATIC_ASSERT(  
    B )
```

##### Value:

```
typedef ::gdcm::static_assert_test<\n    sizeof(::gdcm::STATIC_ASSERTION_FAILURE< (bool) ( B ) >)>\n    GDCM_JOIN(gdcm_static_assert_typedef_, __LINE__)
```

The GDCM\_JOIN + **LINE** is needed to create a uniq identifier.

## 11.62 gdcmStaticAssert.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSTATICASSERT_H
15 #define GDCMSTATICASSERT_H
16
17
18 // the following was shamelessly borrowed from BOOST static assert:
19 namespace gdcm
20 {
21     template <bool x>
22     struct STATIC_ASSERTION_FAILURE;
23
24     template <>
25     struct STATIC_ASSERTION_FAILURE<true> { enum { value = 1 }; };
26
27     template <int x>
28     struct static_assert_test {};
29 }
30
31 #define GDCM_JOIN( X, Y ) GDCM_DO_JOIN( X, Y )
32 #define GDCM_DO_JOIN( X, Y ) GDCM_DO_JOIN2(X,Y)
33 #define GDCM_DO_JOIN2( X, Y ) X##Y
34
35 #define GDCM_STATIC_ASSERT( B ) \
36 typedef ::gdcm::static_assert_test<\
37 sizeof(::gdcm::STATIC_ASSERTION_FAILURE< (bool)( B ) >>>\
38 GDCM_JOIN(gdcm_static_assert_typedef_, __LINE__)
39
40
41
42 /* Example of use:
43 *
44 * template <class T>
45 * struct must_not_be_instantiated
46 * {
47 * // this will be triggered if this type is instantiated
48 * GDCM_STATIC_ASSERT(sizeof(T) == 0);
49 * };
50 *
51 */
52 #endif // GDCMSTATICASSERT_H

```

## 11.63 gdcmString.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmStaticAssert.h"
```

Include dependency graph for gdcmString.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::String< TDelimiter, TMaxLength, TPadChar >](#)

*String.*



## Namespaces

- namespace `gdcm`

## Functions

- `template<char TDelimiter, unsigned int TMaxLength, char TPadChar>`  
`std::istream & gdcm::operator>> (std::istream &is, String< TDelimiter, TMaxLength, TPadChar > &ms)`

## 11.64 gdcmString.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSTRING_H
15 #define GDCMSTRING_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmStaticAssert.h"
19
20 namespace gdcm
21 {
22
23     template <char TDelimiter = '\\', unsigned int TMaxLength = 64, char TPadChar = ' '>
24     class /*GDCM_EXPORT*/ String : public std::string /* PLEASE do not export me */
25     {
26     public:
27         // UI wants \0 for pad character, while ASCII ones wants space char... do not allow anything else
28         GDCM_STATIC_ASSERT( TPadChar == ' ' || TPadChar == 0 );
29
30     public:
31         // typedef are not inherited:
32         typedef std::string::value_type      value_type;
33         typedef std::string::pointer         pointer;
34         typedef std::string::reference       reference;
35         typedef std::string::const_reference const_reference;
36         typedef std::string::size_type      size_type;
37         typedef std::string::difference_type difference_type;
38         typedef std::string::iterator        iterator;
39         typedef std::string::const_iterator const_iterator;
40         typedef std::string::reverse_iterator reverse_iterator;
41         typedef std::string::const_reverse_iterator const_reverse_iterator;
42
43         String(): std::string() {}
44         String(const value_type* s): std::string(s)
45         {
46             if( size() % 2 )
47             {
48                 push_back( TPadChar );
49             }
50         }
51         String(const value_type* s, size_type n): std::string(s, n)
52         {
53             // We are being passed a const char* pointer, so s[n] == 0 (guaranteed!)
54             if( n % 2 )
55             {
56                 push_back( TPadChar );
57             }
58         }
59     };
60
61
62
63
64
65

```

```

66 String(const std::string& s, size_type pos=0, size_type n=npos):
67     std::string(s, pos, n)
68 {
69     // FIXME: some users might already have padded the string 's' with a trailing \0...
70     if( size() % 2 )
71     {
72         push_back( TPadChar );
73     }
74 }
75
76 operator const char *() const { return this->c_str(); }
77
78
79 bool IsValid()const {
80     // Check Length:
81     size_type l = size();
82     if( l > TMaxLength ) return false;
83     return true;
84 }
85
86
87 gdcm::String<TDelimiter, TMaxLength, TPadChar> Truncate()const {
88     if( IsValid() ) return *this;
89     std::string str = *this; // copy
90     str.resize( TMaxLength );
91     return str;
92 }
93
94
95 std::string Trim()const {
96     std::string str = *this; // copy
97     std::string::size_type pos1 = str.find_first_not_of(' ');
98     std::string::size_type pos2 = str.find_last_not_of(' ');
99     str = str.substr( (pos1 == std::string::npos) ? 0 : pos1,
100         (pos2 == std::string::npos) ? (str.size() - 1) : (pos2 - pos1 + 1));
101     return str;
102 }
103
104
105 static std::string Trim(const char *input) {
106     if( !input ) return "";
107     std::string str = input;
108     std::string::size_type pos1 = str.find_first_not_of(' ');
109     std::string::size_type pos2 = str.find_last_not_of(' ');
110     str = str.substr( (pos1 == std::string::npos) ? 0 : pos1,
111         (pos2 == std::string::npos) ? (str.size() - 1) : (pos2 - pos1 + 1));
112     return str;
113 }
114 };
115 template <char TDelimiter, unsigned int TMaxLength, char TPadChar>
116 inline std::istream& operator<>(std::istream &is, String<TDelimiter,TMaxLength,TPadChar> &ms)
117 {
118     if(is)
119     {
120         std::getline(is, ms, TDelimiter);
121         // no such thing as std::get where the delim char would be left, so I need to manually add it back...
122         // hopefully this is the right thing to do (no overhead)
123         if( !is.eof() ) is.putback( TDelimiter );
124     }
125     return is;
126 }
127 //template <char TDelimiter = EOF, unsigned int TMaxLength = 64, char TPadChar = ' '>
128 //String String::Trim() const
129 //{
130 //    String s;
131 //    return s;
132 //}
133
134 } // end namespace gdcm
135
136 #endif //GDCMSTRING_H

```

## 11.65 gdcmSubject.h File Reference

#include "gdcmObject.h"

Include dependency graph for gdcmSubject.h: This graph shows which files directly or indirectly include this file:

## Classes

- class `gdcm::Subject`  
*Subject.*

## Namespaces

- namespace `gdcm`

## 11.66 gdcmSubject.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSUBJECT_H
15 #define GDCMSUBJECT_H
16
17 #include "gdcmObject.h"
18
19 namespace gdcm
20 {
21 class Event;
22 class Command;
23 class SubjectInternals;
24
25 class GDCM_EXPORT Subject : public Object
26 {
27 public:
28     Subject();
29     ~Subject() override;
30
31     unsigned long AddObserver(const Event & event, Command *);
32     unsigned long AddObserver(const Event & event, Command *) const;
33
34     Command* GetCommand(unsigned long tag);
35
36     void InvokeEvent( const Event & );
37     void InvokeEvent( const Event & ) const;
38     void RemoveObserver(unsigned long tag);
39
40     void RemoveAllObservers();
41
42     bool HasObserver( const Event & event ) const;
43
44 protected:
45
46 private:
47     SubjectInternals *Internals;
48 private:
49 };
50
51 } // end namespace gdcm
52
53 #endif //GDCMSUBJECT_H

```

## 11.67 gdcmSwapCode.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmSwapCode.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::SwapCode](#)  
*SwapCode* representation.

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const SwapCode &sc)`

## 11.68 gdcmSwapCode.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSWAPCODE_H
15 #define GDCMSWAPCODE_H
16
17 #include "gdcmTypes.h"
18 #include <iostream>
19
20 namespace gdcm
21 {
22
23 class GDCM_EXPORT SwapCode
24 {
25 public:
26     typedef enum {
27         Unknown      = 0,
28         LittleEndian  = 1234,
29         BigEndian     = 4321,
30         BadLittleEndian = 3412,
31         BadBigEndian  = 2143
32     } SwapCodeType;
33
34     operator SwapCodeType()const { return SwapCodeValue; }
35     SwapCode(SwapCodeType sc = Unknown):SwapCodeValue(sc) { }
36     static const char* GetSwapCodeString(SwapCode const & sc);
37
38 }
39
40
41
```

```

42  friend std::ostream& operator<<(std::ostream& os, const SwapCode& sc);
43 protected:
44     static int GetIndex(SwapCode const & sc);
45
46 private:
47     SwapCodeType SwapCodeValue;
48 };
49 //-----
50 inline std::ostream& operator<<(std::ostream& os, const SwapCode& sc)
51 {
52     os << SwapCode::GetSwapCodeString(sc);
53     return os;
54 }
55
56 } // end namespace gdcm
57
58 #endif //GDCMSWAPCODE_H

```

## 11.69 gdcmSwapper.h File Reference

```

#include "gdcmSwapCode.h"
#include "gdcmSwapper.txx"

```

Include dependency graph for gdcmSwapper.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::SwapperDoOp](#)
- class [gdcm::SwapperNoOp](#)

### Namespaces

- namespace [gdcm](#)

## 11.70 gdcmSwapper.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSWAPPER_H
15 #define GDCMSWAPPER_H
16
17 #include "gdcmSwapCode.h"
18
19 namespace gdcm
20 {
21
22
23 #ifdef GDCM_WORDS_BIGENDIAN

```

```

24 class SwapperDoOp
25 {
26 public:
27     template <typename T> static T Swap(T val) {return val;}
28     template <typename T> static void SwapArray(T *, size_t ) {}
29 };
30
31 class SwapperNoOp
32 {
33 public:
34     template <typename T> static T Swap(T val);
35     template <typename T>
36     static void SwapArray(T *array, size_t n)
37     {
38         // TODO: need to unroll loop:
39         for(size_t i = 0; i < n; ++i)
40         {
41             array[i] = Swap<T>(array[i]);
42         }
43     }
44 };
45 #else
46 class SwapperNoOp
47 {
48 public:
49     template <typename T> static T Swap(T val) {return val;}
50     template <typename T> static void SwapArray(T *, size_t ) {}
51 };
52
53 class SwapperDoOp
54 {
55 public:
56     template <typename T> static T Swap(T val);
57     template <typename T>
58     static void SwapArray(T *array, size_t n)
59     {
60         // TODO: need to unroll loop:
61         for(size_t i = 0; i < n; ++i)
62         {
63             array[i] = Swap<T>(array[i]);
64         }
65     }
66 };
67 #endif
68
69
70 } // end namespace gdcm
71
72 #include "gdcmSwapper.hxx"
73
74 #endif //GDCMSWAPPER_H

```

## 11.71 gdcmSystem.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSystem.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::System](#)  
*Class to do system operation.*

### Namespaces

- namespace [gdcm](#)

## 11.72 gdcmSystem.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSYSTEM_H
15 #define GDCMSYSTEM_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT System
23 {
24 public:
25     static bool MakeDirectory(const char *path);
26     static bool FileExists(const char* filename);
27     static bool FileIsDirectory(const char* name);
28     static bool FileIsSymlink(const char* name);
29     static bool RemoveFile(const char* source);
30     static bool DeleteDirectory(const char *source);
31
32     static std::wstring ConvertToUNC(const char *utf8path);
33
34     static const char *GetLastError();
35
36     static size_t FileSize(const char* filename);
37
38     static time_t FileTime(const char* filename);
39
40     static const char *GetCurrentProcessFileName();
41
42     static const char *GetCurrentModuleFileName();
43
44     static const char *GetCurrentResourcesDirectory();
45
46     // TODO some system calls
47     // Chdir
48     // copy a file
49
50     static bool GetHostName(char hostname[255]);
51
52     // In the following the size '22' is explicitly listed. You need to pass in
53     // at least 22bytes of array. If the string is an output it will be
54     // automatically padded ( array[21] == 0 ) for you.
55     // Those functions: GetCurrentDateTime / FormatDateTime / ParseDateTime do
56     // not return the &YYZZ part of the DT structure as defined in DICOM PS 3.5 -
57     // 2008 In this case it is simple to split the date[22] into a DA and TM
58     // structure
59
60     static bool GetCurrentDateTime(char date[22]);
61
62     static bool FormatDateTime(char date[22], time_t t, long milliseconds = 0);
63
64     static bool ParseDateTime(time_t &timep, const char date[22]);
65
66     static bool ParseDateTime(time_t &timep, long &milliseconds, const char date[22]);
67
68     static const char *GetTimezoneOffsetFromUTC();
69
70     static size_t EncodeBytes(char *out, const unsigned char *data, int size);
71
72     static int StrCaseCmp(const char *s1, const char *s2);
73     static int StrNCaseCmp(const char *s1, const char *s2, size_t n);
74
75     static const char * GetCWD();
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
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120
121
122
123
124

```

```

126 static char *StrTokR(char *ptr, const char *sep, char **end);
127
131 static char *StrSep(char **stringp, const char *delim);
132
134 static const char *GetLocaleCharset();
135
137 /*
138 static void SetArgv0(const char *);
139 static const char* GetArgv0();
140 */
141
142 protected:
143 static bool GetPermissions(const char* file, unsigned short& mode);
144 static bool SetPermissions(const char* file, unsigned short mode);
145
146 private:
147 };
148
149 } // end namespace gdcm
150
151 #endif //GDCMSYSTEM_H

```

## 11.73 gdcmTerminal.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmTerminal.h:

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::terminal](#)

*Class for Terminal.*

### Enumerations

- enum [gdcm::terminal::Attribute](#) {  
[gdcm::terminal::reset](#) = 0 ,  
[gdcm::terminal::bright](#) = 1 ,  
[gdcm::terminal::dim](#) = 2 ,  
[gdcm::terminal::underline](#) = 3 ,  
[gdcm::terminal::blink](#) = 5 ,  
[gdcm::terminal::reverse](#) = 7 ,  
[gdcm::terminal::hidden](#) = 8 }
- enum [gdcm::terminal::Color](#) {  
[gdcm::terminal::black](#) = 0 ,  
[gdcm::terminal::red](#) ,  
[gdcm::terminal::green](#) ,  
[gdcm::terminal::yellow](#) ,  
[gdcm::terminal::blue](#) ,  
[gdcm::terminal::magenta](#) ,  
[gdcm::terminal::cyan](#) ,  
[gdcm::terminal::white](#) }
- enum [gdcm::terminal::Mode](#) {  
[gdcm::terminal::CONSOLE](#) = 0 ,  
[gdcm::terminal::VT100](#) }



## Functions

- `GDCM_EXPORT std::string gdcm::terminal::setattribute` (Attribute att)
- `GDCM_EXPORT std::string gdcm::terminal::setbgcolor` (Color c)
- `GDCM_EXPORT std::string gdcm::terminal::setfgcolor` (Color c)
- `GDCM_EXPORT void gdcm::terminal::setmode` (Mode m)

## 11.74 gdcmTerminal.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTERMINAL_H
15 #define GDCMTERMINAL_H
16
17 #include "gdcmTypes.h"
18
19
20 namespace gdcm
21 {
22 //-----
23 namespace terminal
24 {
25     typedef enum
26     {
27         CONSOLE = 0,
28         VT100
29     } Mode;
30     typedef enum
31     {
32         black = 0,
33         red,
34         green,
35         yellow, // brown ??
36         blue,
37         magenta,
38         cyan,
39         white
40     } Color;
41     typedef enum
42     {
43         reset = 0,
44         bright = 1, // bold
45         dim = 2,
46         underline = 3,
47         blink = 5,
48         reverse = 7,
49         hidden = 8
50     } Attribute;
51     GDCM_EXPORT std::string setattribute( Attribute att );
52     GDCM_EXPORT std::string setfgcolor( Color c );
53     GDCM_EXPORT std::string setbgcolor( Color c );
54     GDCM_EXPORT void setmode( Mode m);
55 }
56
57 } // end namespace gdcm
58 //-----
59 #endif //GDCMTERMINAL_H

```

## 11.75 gdcmTestDriver.h File Reference

```
#include <clocale>
```

```
#include <locale>
```

Include dependency graph for gdcmTestDriver.h:

## 11.76 gdcmTestDriver.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 // This header is included by all the C++ test drivers in GDCM.
15 #ifndef GDCMTESTDRIVER_H
16 #define GDCMTESTDRIVER_H
17
18 // CREATE_TEST_SOURCELIST supports the flag EXTRA_INCLUDE but only one per call.
19 // So there is no way to specify we want to include two files... instead
20 // gather the #include in a single file and include that one...
21 #include <clocale> // C setlocale()
22 #include <locale> // C++ locale
23
24 #endif // GDCMTESTDRIVER_H
```

## 11.77 gdcmTesting.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmTesting.h:

### Classes

- class [gdcm::Testing](#)  
*class for testing*

### Namespaces

- namespace [gdcm](#)

## 11.78 gdcmTesting.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTESTING_H
15 #define GDCMTESTING_H
16
17 #include "gdcmTypes.h"
18
19 #include <iostream>
20
21 namespace gdcm
22 {
23 //-----
24 class GDCM_EXPORT Testing
25 {
26 public :
27     Testing() = default;;
28     ~Testing() = default;;
29
30     static bool ComputeMD5(const char *buffer, size_t buf_len,
31         char digest_str[33]);
32     static bool ComputeFileMD5(const char *filename, char digest_str[33]);
33
34     void Print(std::ostream &os = std::cout);
35
36     static const char * const * GetFileNames();
37     static unsigned int GetNumberOfFileNames();
38     static const char * GetFileName(unsigned int file);
39
40     typedef const char* const (*MediaStorageDataFilesType)[2];
41     static MediaStorageDataFilesType GetMediaStorageDataFiles();
42     static unsigned int GetNumberOfMediaStorageDataFiles();
43     static const char * const * GetMediaStorageDataFile(unsigned int file);
44     static const char * GetMediaStorageFromFile(const char *filepath);
45
46     typedef const char* const (*MD5DataImagesType)[2];
47     static MD5DataImagesType GetMD5DataImages();
48     static unsigned int GetNumberOfMD5DataImages();
49     static const char * const * GetMD5DataImage(unsigned int file);
50     static const char * GetMD5FromFile(const char *filepath);
51
52     static const char * GetMD5FromBrokenFile(const char *filepath);
53
54     static std::streamoff GetStreamOffsetFromFile(const char *filepath);
55
56     static std::streamoff GetSelectedTagsOffsetFromFile(const char *filepath);
57
58     static std::streamoff GetSelectedPrivateGroupOffsetFromFile(const char *filepath);
59
60     static int GetLossyFlagFromFile(const char *filepath);
61
62     static const char * GetDataRoot();
63
64     static const char * GetDataExtraRoot();
65
66     static const char * GetPixelSpacingDataRoot();
67
68     static const char * GetTempDirectory(const char * subdir = nullptr);
69
70     static const wchar_t *GetTempDirectoryW(const wchar_t * subdir = nullptr);
71
72     static const char * GetTempFilename(const char *filename, const char * subdir = nullptr);
73
74     static const wchar_t* GetTempFilenameW(const wchar_t *filename, const wchar_t* subdir = nullptr);
75
76     static const char *GetSourceDirectory();

```

```

116 };
117 } // end namespace gdcm
118 //-----
119 #endif //GDCMTESTING_H

```

## 11.79 gdcmTrace.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmSystem.h"
#include <iosfwd>
#include <cassert>

```

Include dependency graph for gdcmTrace.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Trace](#)  
*Trace.*

### Namespaces

- namespace [gdcm](#)

### Macros

- #define [GDCM\\_FUNCTION](#) "<unknown>"
- #define [gdcmAssertAlwaysMacro](#)(arg) [gdcmAssertMacro](#)(arg)  
*AssertAlways.*
- #define [gdcmAssertMacro](#)(arg)  
*Assert.*
- #define [gdcmDebugMacro](#)(msg)  
*Debug.*
- #define [gdcmErrorMacro](#)(msg)  
*Error this is pretty bad, more than just warning It could mean lost of data, something not handle...*
- #define [gdcmWarningMacro](#)(msg)  
*Warning.*

## 11.79.1 Macro Definition Documentation

### 11.79.1.1 GDCM\_FUNCTION

```
#define GDCM_FUNCTION "<unknown>"
```

### 11.79.1.2 gdcmAssertAlwaysMacro

```
#define gdcmAssertAlwaysMacro(  
    arg ) gdcmAssertMacro(arg)
```

AssertAlways.

## Parameters

<i>arg</i>	argument to test An easy solution to pass also a message is to do: <code>gdcmaAssertMacro( "my message" &amp;&amp; 2 &lt; 3 )</code>
------------	--

11.79.1.3 `gdcmaAssertMacro`

```
#define gdcmaAssertMacro(
    arg )
```

## Value:

```
{
    if( !(arg) )
    {
        std::ostringstream osmacro;
        osmacro << "Assert: In " __FILE__ ", line " << __LINE__
            << ", function " << GDCM_FUNCTION
            << "\n\n";
        std::ostream &_os = gdcma::Trace::GetErrorStream();
        _os << osmacro.str() << std::endl;
        assert ( arg );
    }
}
GDCM_NOOP_STATEMENT
```

Assert.

## Parameters

<i>arg</i>	argument to test An easy solution to pass also a message is to do: <code>gdcmaAssertMacro( "my message" &amp;&amp; 2 &lt; 3 )</code>
------------	--

11.79.1.4 `gdcmaDebugMacro`

```
#define gdcmaDebugMacro(
    msg )
```

## Value:

```
{
    if( gdcma::Trace::GetDebugFlag() )
    {
        std::ostringstream osmacro;
        osmacro << "Debug: In " __FILE__ ", line " << __LINE__
            << ", function " << GDCM_FUNCTION << '\n'
            << "Last system error was: "
            << gdcma::System::GetLastSystemError() << '\n' << msg;
        std::ostream &_os = gdcma::Trace::GetDebugStream();
        _os << osmacro.str() << "\n\n" << std::endl;
    }
}
GDCM_NOOP_STATEMENT
```

Debug.

## Parameters

<i>msg</i>	message part
------------	--------------

## 11.79.1.5 gdcmErrorMacro

```
#define gdcmErrorMacro(
    msg )
```

## Value:

```
{
    if( gdcm::Trace::GetErrorFlag() )
    {
        std::ostringstream osmacro;
        osmacro << "Error: In " __FILE__ ", line " << __LINE__
            << ", function " << GDCM_FUNCTION << '\n'
            << msg << "\n\n";
        std::ostream &_os = gdcm::Trace::GetErrorStream();
        _os << osmacro.str() << std::endl;
    }
}
GDCM_NOOP_STATEMENT
```

Error this is pretty bad, more than just warning It could mean lost of data, something not handle...

## Parameters

<i>msg</i>	second message part
------------	---------------------

## 11.79.1.6 gdcmWarningMacro

```
#define gdcmWarningMacro(
    msg )
```

## Value:

```
{
    if( gdcm::Trace::GetWarningFlag() )
    {
        std::ostringstream osmacro;
        osmacro << "Warning: In " __FILE__ ", line " << __LINE__
            << ", function " << GDCM_FUNCTION << "\n"
            << msg << "\n\n";
        std::ostream &_os = gdcm::Trace::GetWarningStream();
        _os << osmacro.str() << std::endl;
    }
}
GDCM_NOOP_STATEMENT
```

Warning.

## Parameters

<i>msg</i>	message part
------------	--------------

## 11.80 gdcmTrace.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTRACE_H
15 #define GDCMTRACE_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmSystem.h"
19
20 #include <iosfwd>
21 #include <cassert>
22
23 namespace gdcm
24 {
25
26     class GDCM_EXPORT Trace
27     {
28     public :
29         Trace();
30         ~Trace();
31
32         static void SetStream(std::ostream &os);
33         static std::ostream &GetStream();
34
35         static void SetDebugStream(std::ostream &os);
36         static std::ostream &GetDebugStream();
37
38         static void SetWarningStream(std::ostream &os);
39         static std::ostream &GetWarningStream();
40
41         static void SetErrorStream(std::ostream &os);
42         static std::ostream &GetErrorStream();
43
44         static void SetStreamToFile( const char *filename );
45
46         static void SetDebug(bool debug);
47         static void DebugOn();
48         static void DebugOff();
49         static bool GetDebugFlag();
50
51         static void SetWarning(bool debug);
52         static void WarningOn();
53         static void WarningOff();
54         static bool GetWarningFlag();
55
56         static void SetError(bool debug);
57         static void ErrorOn();
58         static void ErrorOff();
59         static bool GetErrorFlag();
60
61     protected:
62     private:
63     };
64
65 // Here we define function this is the only way to be able to pass

```



```

91 // stuff with indirection like:
92 // gdcmDebug( "my message:" « i « '\t' );
93 // You cannot use function unless you use vnsprintf ...
94
95 // __FUNCTION__ is not always defined by preprocessor
96 // In c++ we should use __PRETTY_FUNCTION__ instead...
97 #ifdef GDCM_CXX_HAS_FUNCTION
98 // Handle particular case for GNU C++ which also defines __PRETTY_FUNCTION__
99 // which is a lot nice in C++
100 #ifdef __BORLANDC__
101 # define __FUNCTION__ __FUNC__
102 #endif
103 #ifdef __GNUC__
104 # define GDCM_FUNCTION __PRETTY_FUNCTION__
105 #else
106 # define GDCM_FUNCTION __FUNCTION__
107 #endif //__GNUC__
108 #else
109 # define GDCM_FUNCTION "<unknown>"
110 #endif //GDCM_CXX_HAS_FUNCTION
111
112 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
113 #define gdcmDebugMacro(msg) GDCM_NOOP_STATEMENT
114 #else
115 #define gdcmDebugMacro(msg)
116 {
117     if( gdcm::Trace::GetDebugFlag() )
118     {
119         std::ostringstream osmacro;
120         osmacro « "Debug: In " __FILE__ ", line " « __LINE__
121             « ", function " « GDCM_FUNCTION « '\n'
122             « "Last system error was: "
123             « gdcm::System::GetLastError() « '\n' « msg;
124         std::ostream &_os = gdcm::Trace::GetDebugStream();
125         _os « osmacro.str() « "\n\n" « std::endl;
126     }
127 }
128 GDCM_NOOP_STATEMENT
129 #endif //NDEBUG
130
131 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
132 #define gdcmWarningMacro(msg) GDCM_NOOP_STATEMENT
133 #else
134 #define gdcmWarningMacro(msg)
135 {
136     if( gdcm::Trace::GetWarningFlag() )
137     {
138         std::ostringstream osmacro;
139         osmacro « "Warning: In " __FILE__ ", line " « __LINE__
140             « ", function " « GDCM_FUNCTION « "\n"
141             « msg « "\n\n";
142         std::ostream &_os = gdcm::Trace::GetWarningStream();
143         _os « osmacro.str() « std::endl;
144     }
145 }
146 GDCM_NOOP_STATEMENT
147 #endif //NDEBUG
148
149 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
150 #define gdcmErrorMacro(msg) GDCM_NOOP_STATEMENT
151 #else
152 #define gdcmErrorMacro(msg)
153 {
154     if( gdcm::Trace::GetErrorFlag() )
155     {
156         std::ostringstream osmacro;
157         osmacro « "Error: In " __FILE__ ", line " « __LINE__
158             « ", function " « GDCM_FUNCTION « '\n'
159             « msg « "\n\n";
160         std::ostream &_os = gdcm::Trace::GetErrorStream();
161         _os « osmacro.str() « std::endl;
162     }
163 }
164 GDCM_NOOP_STATEMENT
165 #endif //NDEBUG
166
167 #if defined(NDEBUG) && !defined(GDCM_ALWAYS_TRACE_MACRO)
168 #define gdcmAssertMacro(arg) GDCM_NOOP_STATEMENT
169 #else
170 #define gdcmAssertMacro(arg)
171 {
172     if( !arg )
173     {
174         std::ostringstream osmacro;
175         osmacro « "Assert: In " __FILE__ ", line " « __LINE__
176             « ", function " « GDCM_FUNCTION « "\n"
177             « "Assertion failed: " « arg « "\n\n";
178         std::ostream &_os = gdcm::Trace::GetErrorStream();
179         _os « osmacro.str() « std::endl;
180     }
181 }
182 GDCM_NOOP_STATEMENT
183 #endif //NDEBUG

```

```

191 if( !(arg) )
192 {
193     std::ostringstream osmacro;
194     osmacro << "Assert: In " __FILE__ ", line " << __LINE__
195         << ", function " << GDCM_FUNCTION
196         << "\n\n";
197     std::ostream &_os = gdcm::Trace::GetErrorStream();
198     _os << osmacro.str() << std::endl;
199     assert ( arg );
200 }
201 }
202 GDCM_NOOP_STATEMENT
203 #endif //NDEBUG
204
205 #if defined(NDEBUG)
206 // User asked for release compilation, but still need to report
207 // if grave issue.
208 #define gdcmAssertAlwaysMacro(arg) \
209 {
210 if( !(arg) )
211 {
212     std::ostringstream osmacro;
213     osmacro << "Assert: In " __FILE__ ", line " << __LINE__
214         << ", function " << GDCM_FUNCTION
215         << "\n\n";
216     throw osmacro.str();
217 }
218 }
219 GDCM_NOOP_STATEMENT
220 #else
221 // Simply reproduce gdcmAssertMacro behavior:
222 #define gdcmAssertAlwaysMacro(arg) gdcmAssertMacro(arg)
223 #endif //NDEBUG
224
225 } // end namespace gdcm
226 //-----
227 #endif //GDCMTRACE_H

```

## 11.81 gdcmTypes.h File Reference

```

#include "gdcmConfigure.h"
#include "gdcmWin32.h"
#include "gdcmLegacyMacro.h"
#include <cstdint>

```

Include dependency graph for gdcmTypes.h:

## 11.82 gdcmTypes.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTYPES_H
15 #define GDCMTYPES_H
16
17 #include "gdcmConfigure.h"
18 #include "gdcmWin32.h"

```

```

19 #include "gdcmLegacyMacro.h"
20
21 //-----
22 #include <cstdint>
23
24 //-----
25 #endif //GDCMTYPES_H

```

## 11.83 gdcmUnpacker12Bits.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUnpacker12Bits.h:

### Classes

- class [gdcm::Unpacker12Bits](#)  
*Pack/Unpack 12 bits pixel into 16bits.*

### Namespaces

- namespace [gdcm](#)

## 11.84 gdcmUnpacker12Bits.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUNPACKER12BITS_H
15 #define GDCMUNPACKER12BITS_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT Unpacker12Bits
22     {
23     public:
24         static bool Pack(char *out, const char *in, size_t n);
25
26         static bool Unpack(char *out, const char *in, size_t n);
27     };
28 } // end namespace gdcm
29
30 #endif //GDCMUNPACKER12BITS_H

```

## 11.85 gdcmVersion.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmVersion.h:

### Classes

- class [gdcm::Version](#)  
*major/minor and build version*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Version &v)`

## 11.86 gdcmVersion.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVERSION_H
15 #define GDCMVERSION_H
16
17 #include "gdcmTypes.h"
18 #include <iostream>
19
20 namespace gdcm
21 {
22
23 //-----
24 class GDCM_EXPORT Version
25 {
26     friend std::ostream& operator<<(std::ostream &_os, const Version &v);
27 public:
28     static const char *GetVersion();
29     static int GetMajorVersion();
30     static int GetMinorVersion();
31     static int GetBuildVersion();
32
33     void Print(std::ostream &os = std::cout) const;
34
35 //protected:
36     Version() = default;
37     ~Version() = default;
38 };
39
40 }
```

```

42 //-----
43 inline std::ostream& operator<<(std::ostream &os, const Version &v)
44 {
45     v.Print( os );
46     return os;
47 }
48
49 } // end namespace gdcm
50 //-----
51 #endif //GDCMVERSION_H

```

## 11.87 gdcmWin32.h File Reference

This graph shows which files directly or indirectly include this file:

### Macros

- #define `GDCM_EXPORT`

### 11.87.1 Macro Definition Documentation

#### 11.87.1.1 GDCM\_EXPORT

```
#define GDCM_EXPORT
```

## 11.88 gdcmWin32.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMWIN32_H
16 #define GDCMWIN32_H
17
18 #if !defined(GDCMTYPES_H)
19 #error you need to include gdcmTypes.h instead
20 #endif
21 //-----
22 // http://gcc.gnu.org/wiki/Visibility
23 #if defined(_WIN32) && defined(GDCM_BUILD_SHARED_LIBS)

```

```

24 #if (defined(gdcmCommon_EXPORTS) || defined(gdcmDICT_EXPORTS) || defined(gdcmDSED_EXPORTS) ||
    defined(gdcmIOD_EXPORTS) || defined(gdcmMSFF_EXPORTS) || defined(gdcmMEXD_EXPORTS) ||
    defined(_gdcmSwig_EXPORTS)) || defined(vtkgdcm_EXPORTS)
25 #define GDCM_EXPORT __declspec( dllexport )
26 #else
27 #define GDCM_EXPORT __declspec( dllimport )
28 #endif
29 #else
30 #if __GNUC__ >= 4 && defined(GDCM_BUILD_SHARED_LIBS)
31 #define GDCM_EXPORT __attribute__ ((visibility ("default")))
32 #define GDCM_LOCAL __attribute__ ((visibility ("hidden")))
33 #else
34 #define GDCM_EXPORT
35 #endif
36 #endif
37
38 #if defined(GDCM_OVERRIDE_BROKEN_IMPLEMENTATION) && !defined(GDCM_FORCE_EXPORT)
39 #undef GDCM_EXPORT
40 #define GDCM_EXPORT
41 #endif
42
43 // In VTK 4.2 vtkWrapPython does not like anything other than VTK_*EXPORT
44 // [ 86%] Generating vtkGDCMImageReaderPython.cxx
45 // syntax error
46 // *** SYNTAX ERROR found in parsing the header file
    /usr/local/src/gdcm2/tags/gdcm-2-0-11/Utilities/VTK/vtkGDCMImageReader.h before line 128***
47 // make[2]: *** [Utilities/VTK/vtkGDCMImageReaderPython.cxx] Error 1
48 // make[1]: *** [Utilities/VTK/CMakeFiles/vtkgdcmPythonD.dir/all] Error 2
49 // make: *** [all] Error 2
50
51 #if defined(VTK_MAJOR_VERSION) && ( VTK_MAJOR_VERSION == 4 )
52 #undef VTK_EXPORT
53 #define VTK_EXPORT GDCM_EXPORT
54 #endif
55
56 //-----
57 //This is needed when compiling in debug mode
58 #ifdef _MSC_VER
59 // to allow construct such as: std::numeric_limits<int>::max() we need the following:
60 // warning C4003: not enough actual parameters for macro 'max'
61 #ifndef NOMINMAX
62 #define NOMINMAX
63 #endif
64 #pragma warning ( default : 4263 ) /* no override, call convention differs */
65 // 'identifier' : class 'type' needs to have dll-interface to be used by
66 // clients of class 'type2'
67 #pragma warning ( disable : 4251 )
68 // non dll-interface class 'type' used as base for dll-interface class 'type2'
69 #pragma warning ( disable : 4275 )
70 // 'identifier' : identifier was truncated to 'number' characters in the
71 // debug information
72 #pragma warning ( disable : 4786 )
73 // 'identifier' : decorated name length exceeded, name was truncated
74 #pragma warning ( disable : 4503 )
75 #endif // _MSC_VER
76
77 //-----
78 #endif //GDCMWIN32_H

```

## 11.89 gdcmCSAHeaderDict.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmCSAHeaderDictEntry.h"
#include <iostream>
#include <iomanip>
#include <set>
#include <exception>

```

Include dependency graph for gdcmCSAHeaderDict.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::CSAHeaderDict](#)  
Class to represent a map of *CSAHeaderDictEntry*.
- class [gdcm::CSAHeaderDictException](#)

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const CSAHeaderDict &val)`

## 11.90 gdcmCSAHeaderDict.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCSAHEADERDICT_H
15 #define GDCMCSAHEADERDICT_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTag.h"
19 #include "gdcmCSAHeaderDictEntry.h"
20
21 #include <iostream>
22 #include <iomanip>
23 #include <set>
24 #include <exception>
25
26 namespace gdcm
27 {
28
29 class GDCM_EXPORT CSAHeaderDictException : public std::exception {}
30
31 class GDCM_EXPORT CSAHeaderDict
32 {
33 public:
34     typedef std::set<CSAHeaderDictEntry> MapCSAHeaderDictEntry;
35     typedef MapCSAHeaderDictEntry::iterator Iterator;
36     typedef MapCSAHeaderDictEntry::const_iterator ConstIterator;
37     //static CSAHeaderDictEntry GroupLengthCSAHeaderDictEntry; // = CSAHeaderDictEntry("Group
38     Length",VR::UL,VM::VM1);
39
40     CSAHeaderDict():CSAHeaderDictInternal() {
41         assert( CSAHeaderDictInternal.empty() );
42     }
43     CSAHeaderDict &operator=(const CSAHeaderDict &_val) = delete;
44     CSAHeaderDict(const CSAHeaderDict &_val) = delete;
45
46     friend std::ostream& operator<<(std::ostream& _os, const CSAHeaderDict &_val);
47
48
49

```

```

50  ConstIterator Begin()const { return CSAHeaderDictInternal.begin(); }
51  ConstIterator End()const { return CSAHeaderDictInternal.end(); }
52
53  bool IsEmpty()const { return CSAHeaderDictInternal.empty(); }
54  void AddCSAHeaderDictEntry(const CSAHeaderDictEntry &de)
55  {
56  #ifndef NDEBUG
57      MapCSAHeaderDictEntry::size_type s = CSAHeaderDictInternal.size();
58  #endif
59      CSAHeaderDictInternal.insert( de );
60      assert( s < CSAHeaderDictInternal.size() );
61  }
62
63  const CSAHeaderDictEntry &GetCSAHeaderDictEntry(const char *name)const
64  {
65      MapCSAHeaderDictEntry::const_iterator it = CSAHeaderDictInternal.find( name );
66      if( it != CSAHeaderDictInternal.end() )
67      {
68          return *it;
69      }
70      throw CSAHeaderDictException();
71  }
72
73 protected:
74     friend class Dicts;
75     void LoadDefault();
76
77 private:
78
79     MapCSAHeaderDictEntry CSAHeaderDictInternal;
80 };
81 //-----
82 inline std::ostream& operator<<(std::ostream& os, const CSAHeaderDict &val)
83 {
84     CSAHeaderDict::MapCSAHeaderDictEntry::const_iterator it = val.CSAHeaderDictInternal.begin();
85     for(; it != val.CSAHeaderDictInternal.end(); ++it)
86     {
87         const CSAHeaderDictEntry &de = *it;
88         os << de << '\n';
89     }
90
91     return os;
92 }
93
94
95
96 } // end namespace gdcm
97
98 #endif //GDCMCSAHEADERDICT_H

```

## 11.91 gdcmCSAHeaderDictEntry.h File Reference

```

#include "gdcmVR.h"
#include "gdcmVM.h"
#include <string>
#include <iostream>
#include <iomanip>
#include <cstring>

```

Include dependency graph for gdcmCSAHeaderDictEntry.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::CSAHeaderDictEntry](#)  
Class to represent an Entry in the Dict.



## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const CSAHeaderDictEntry &val)`

## 11.92 gdcmCSAHeaderDictEntry.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCSAHEADERDICTENTRY_H
15 #define GDCMCSAHEADERDICTENTRY_H
16
17 #include "gdcmVR.h"
18 #include "gdcmVM.h"
19
20 #include <string>
21 #include <iostream>
22 #include <iomanip>
23
24 #include <cstring>
25
26 namespace gdcm
27 {
28 class GDCM_EXPORT CSAHeaderDictEntry
29 {
30 public:
31     CSAHeaderDictEntry(const char *name = "", VR const &vr = VR::INVALID, VM const &vm = VM::VM0, const char
32 *desc = ""):Name(name),ValueRepresentation(vr),ValueMultiplicity(vm),Description(desc) {
33 }
34
35     friend std::ostream& operator<<(std::ostream& _os, const CSAHeaderDictEntry &_val);
36
37     const VR &GetVR()const { return ValueRepresentation; }
38     void SetVR(const VR &vr) { ValueRepresentation = vr; }
39
40     const VM &GetVM()const { return ValueMultiplicity; }
41     void SetVM(VM const &vm) { ValueMultiplicity = vm; }
42
43     const char *GetName()const { return Name.c_str(); }
44     void SetName(const char* name) { Name = name; }
45
46     const char *GetDescription()const { return Description.c_str(); }
47     void SetDescription(const char* desc) { Description = desc; }
48
49     bool operator<(const CSAHeaderDictEntry &entry)const
50     {
51         return strcmp(GetName(),entry.GetName()) < 0;
52     }
53
54 private:
55     std::string Name;
56     VR ValueRepresentation;
57     VM ValueMultiplicity;
58     std::string Description;
59     std::string Type; // TODO
60
61
62
63
64
65
66
67
68
69
70
71
72

```

```

73 };
74
75
76 //-----
77 inline std::ostream& operator<<(std::ostream& os, const CSAHeaderDictEntry &val)
78 {
79     if( val.Name.empty() )
80     {
81         os << "[No name]";
82     }
83     else
84     {
85         os << val.Name;
86     }
87     os << "\t" << val.ValueRepresentation << "\t" << val.ValueMultiplicity;
88     if( !val.Description.empty() )
89     {
90         os << "\t" << val.Description;
91     }
92     return os;
93 }
94
95 } // end namespace gdcm
96
97 #endif //GDCMCSAHEADERDICTENTRY_H

```

## 11.93 gdcmDict.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmDictEntry.h"
#include "gdcmSystem.h"
#include <iostream>
#include <iomanip>
#include <map>

```

Include dependency graph for gdcmDict.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Dict](#)  
*Class to represent a map of [DictEntry](#).*
- class [gdcm::PrivateDict](#)  
*Private [Dict](#).*

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const Dict &val)
- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const PrivateDict &val)

## 11.94 gdcmDict.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDICT_H
15 #define GDCMDICT_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTag.h"
19 #include "gdcmPrivateTag.h"
20 #include "gdcmDictEntry.h"
21 #include "gdcmSystem.h"
22
23 #include <iostream>
24 #include <iomanip>
25 #include <map>
26
27 /*
28 * FIXME / TODO
29 * I need to seriously rewrite this mess. a class template should work for both a public
30 * and a private dict
31 */
32
33 namespace gdcm
34 {
35 // Data Element Tag
36 class GDCM_EXPORT Dict
37 {
38 public:
39     typedef std::map<Tag, DictEntry> MapDictEntry;
40     typedef MapDictEntry::iterator Iterator;
41     typedef MapDictEntry::const_iterator ConstIterator;
42     //static DictEntry GroupLengthDictEntry; // = DictEntry("Group Length",VR::UL,VM::VM1);
43
44     Dict():DictInternal() {
45         assert( DictInternal.empty() );
46     }
47     Dict &operator=(const Dict &_val) = delete;
48     Dict(const Dict &_val) = delete;
49
50     friend std::ostream& operator<<(std::ostream& _os, const Dict &_val);
51
52     ConstIterator Begin()const { return DictInternal.begin(); }
53     ConstIterator End()const { return DictInternal.end(); }
54
55     bool IsEmpty()const { return DictInternal.empty(); }
56     void AddDictEntry(const Tag &tag, const DictEntry &de)
57     {
58         #ifndef NDEBBUG
59         MapDictEntry::size_type s = DictInternal.size();
60         #endif
61         DictInternal.insert(
62             MapDictEntry::value_type(tag, de));
63         assert( s < DictInternal.size() );
64     }
65
66     const DictEntry &GetDictEntry(const Tag &tag)const
67     {
68         MapDictEntry::const_iterator it =
69             DictInternal.find(tag);
70         if (it == DictInternal.end())
71         {
72             #ifdef UNKNOWNPUBLICTAG
73             // test.acr
74             if( tag != Tag(0x28,0x15)
75                 && tag != Tag(0x28,0x16)

```

```

85         && tag != Tag(0x28,0x199)
86         // gdcmData/TherapysGDCM1.dcm
87         && tag != Tag(0x20,0x1)
88         // gdcmData/0019004_Baseline_IMG1.dcm
89         && tag != Tag(0x8348,0x339)
90         && tag != Tag(0xb5e8,0x338)
91         // gdcmData/dicomdir_Acusson_WithPrivate_WithSR
92         && tag != Tag(0x40,0xa125)
93     )
94     {
95         assert( 0 && "Impossible" );
96     }
97 #endif
98     it = DictInternal.find( Tag(0xffff,0xffff) );
99     return it->second;
100 }
101 assert( DictInternal.count(tag) == 1 );
102 return it->second;
103 }
104
105 const char *GetKeywordFromTag(Tag const & tag)const
106 {
107     MapDictEntry::const_iterator it =
108         DictInternal.find(tag);
109     if (it == DictInternal.end())
110     {
111         return nullptr;
112     }
113     assert( DictInternal.count(tag) == 1 );
114     return it->second.GetKeyword();
115 }
116
117 const DictEntry &GetDictEntryByKeyword(const char *keyword, Tag & tag)const
118 {
119     MapDictEntry::const_iterator it =
120         DictInternal.begin();
121     if( keyword )
122     {
123         for(; it != DictInternal.end(); ++it)
124         {
125             if( strcmp( keyword, it->second.GetKeyword() ) == 0 )
126             {
127                 // Found a match !
128                 tag = it->first;
129                 break;
130             }
131         }
132     }
133     else
134     {
135         it = DictInternal.end();
136     }
137     if (it == DictInternal.end())
138     {
139         tag = Tag(0xffff,0xffff);
140         it = DictInternal.find( tag );
141         return it->second;
142     }
143     assert( DictInternal.count(tag) == 1 );
144     return it->second;
145 }
146
147 const DictEntry &GetDictEntryByName(const char *name, Tag & tag)const
148 {
149     MapDictEntry::const_iterator it =
150         DictInternal.begin();
151     if( name )
152     {
153         for(; it != DictInternal.end(); ++it)
154         {
155             if( strcmp( name, it->second.GetName() ) == 0 )
156             {
157                 // Found a match !
158                 tag = it->first;
159                 break;
160             }
161         }
162     }
163     else
164     {
165         it = DictInternal.end();
166     }

```

```

174     }
175     if (it == DictInternal.end())
176     {
177         tag = Tag(0xffff,0xffff);
178         it = DictInternal.find( tag );
179         return it->second;
180     }
181     assert( DictInternal.count(tag) == 1 );
182     return it->second;
183 }
184
185 protected:
186     friend class Dicts;
187     void LoadDefault();
188
189 private:
190     MapDictEntry DictInternal;
191 };
192 //-----
193 inline std::ostream& operator<<(std::ostream& os, const Dict &val)
194 {
195     Dict::MapDictEntry::const_iterator it = val.DictInternal.begin();
196     for(;it != val.DictInternal.end(); ++it)
197     {
198         const Tag &t = it->first;
199         const DictEntry &de = it->second;
200         os << t << " " << de << '\n';
201     }
202
203     return os;
204 }
205
206 // TODO
207 // For private dict, element < 0x10 should automatically defined:
208 // Name = "Private Creator"
209 // ValueRepresentation = LO
210 // ValueMultiplicity = 1
211 // Owner = ""
212
213 class GDCM_EXPORT PrivateDict
214 {
215     typedef std::map<PrivateTag, DictEntry> MapDictEntry;
216     friend std::ostream& operator<<(std::ostream& os, const PrivateDict &val);
217 public:
218     PrivateDict() = default;
219     ~PrivateDict() = default;
220     void AddDictEntry(const PrivateTag &tag, const DictEntry &de)
221     {
222         #ifndef NDEBUG
223         MapDictEntry::size_type s = DictInternal.size();
224         #endif
225         DictInternal.insert(
226             MapDictEntry::value_type(tag, de));
227         // The following code should only be used when manually constructing a Private.xml file by hand
228         // it will get rid of VR::UN duplicate (ie. if a VR != VR::Un can be found)
229         #if defined(NDEBUG) && 0
230         if( s == DictInternal.size() )
231         {
232             MapDictEntry::iterator it =
233                 DictInternal.find(tag);
234             assert( it != DictInternal.end() );
235             DictEntry &duplicate = it->second;
236             assert( de.GetVR() == VR::UN || duplicate.GetVR() == VR::UN );
237             assert( de.GetVR() != duplicate.GetVR() );
238             if( duplicate.GetVR() == VR::UN )
239             {
240                 assert( de.GetVR() != VR::UN );
241                 duplicate.SetVR( de.GetVR() );
242                 duplicate.SetVM( de.GetVM() );
243                 assert( GetDictEntry(tag).GetVR() != VR::UN );
244                 assert( GetDictEntry(tag).GetVR() == de.GetVR() );
245                 assert( GetDictEntry(tag).GetVM() == de.GetVM() );
246             }
247             return;
248         }
249         #endif
250         assert( s < DictInternal.size() /*&& std::cout << tag << ", " << de << std::endl*/ );
251     }
252     bool RemoveDictEntry(const PrivateTag &tag)
253     {
254         MapDictEntry::size_type s =

```

```

260     DictInternal.erase(tag);
261     assert( s == 1 || s == 0 );
262     return s == 1;
263 }
264 bool FindDictEntry(const PrivateTag &tag) const
265 {
266     MapDictEntry::const_iterator it =
267         DictInternal.find(tag);
268     if (it == DictInternal.end())
269     {
270         return false;
271     }
272     return true;
273 }
274 const DictEntry &GetDictEntry(const PrivateTag &tag) const
275 {
276     // if 0x10 -> return Private Creator
277     MapDictEntry::const_iterator it =
278         DictInternal.find(tag);
279     if (it == DictInternal.end())
280     {
281         //assert( 0 && "Impossible" );
282         it = DictInternal.find( PrivateTag(0xffff,0xffff,"GDCM Private Sentinel" ) );
283         assert (it != DictInternal.end());
284         return it->second;
285     }
286     assert( DictInternal.count(tag) == 1 );
287     return it->second;
288 }
289
290
291 void PrintXML() const
292 {
293     MapDictEntry::const_iterator it = DictInternal.begin();
294     std::cout << "<dict edition=\"2008\">\n";
295     for(; it != DictInternal.end(); ++it)
296     {
297         const PrivateTag &t = it->first;
298         const DictEntry &de = it->second;
299         std::cout << " <entry group=\"" << std::hex << std::setw(4)
300             << std::setfill('0') << t.GetGroup() << "\" \" <
301             " element=\"" << std::setw(2) << std::setfill('0') << t.GetElement() << "\" \" < " vr=\""
302             << de.GetVR() << "\" vm=\"" << de.GetVM() << "\" owner=\""
303             << t.GetOwner();
304         const char *name = de.GetName();
305         if( *name == 0 )
306         {
307             std::cout << "\"/>\n";
308         }
309         else
310         {
311             std::cout << "\" name=\"" << de.GetName() << "\"/>\n";
312         }
313     }
314     std::cout << "</dict>\n";
315 }
316
317 bool IsEmpty() const { return DictInternal.empty(); }
318 protected:
319     friend class Dicts;
320     void LoadDefault();
321 private:
322     PrivateDict &operator=(const PrivateDict &_val) = delete;
323     PrivateDict(const PrivateDict &_val) = delete;
324
325     MapDictEntry DictInternal;
326 };
327
328 //-----
329 inline std::ostream& operator<<(std::ostream& os, const PrivateDict &val)
330 {
331     PrivateDict::MapDictEntry::const_iterator it = val.DictInternal.begin();
332     for(; it != val.DictInternal.end(); ++it)
333     {
334         const PrivateTag &t = it->first;
335         const DictEntry &de = it->second;
336         os << t << " " << de << '\n';
337     }
338
339     return os;
340 }

```

```

341
342 } // end namespace gdcm
343
344 #endif //GDCMDICT_H

```

## 11.95 gdcmDictConverter.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmVM.h"
#include <string>
Include dependency graph for gdcmDictConverter.h:

```

### Classes

- class [gdcm::DictConverter](#)  
*Class to convert a .dic file into something else:*

### Namespaces

- namespace [gdcm](#)

## 11.96 gdcmDictConverter.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMDICTCONVERTER_H
16 #define GDCMDICTCONVERTER_H
17
18 #include "gdcmTypes.h"
19 #include "gdcmVR.h"
20 #include "gdcmVM.h"
21
22 #include <string>
23
24 namespace gdcm
25 {
26
27 class DictConverterInternal;
28 class GDCM_EXPORT DictConverter
29 {
30 public:
31     DictConverter();
32     ~DictConverter();
33     void SetInputFileName(const char* filename);

```

```

42  const std::string &GetInputFilename() const;
43  void SetOutputFileName(const char* filename);
44  const std::string &GetOutputFilename() const;
45
46  int GetOutputType()const {
47      return OutputType;
48  }
49  void SetOutputType(int type) {
50      OutputType = type;
51  }
52  const std::string &GetDictName() const;
53  void SetDictName(const char *name);
54
55  void Convert();
56
57  // Leaving them public for now. Not really user oriented but may be
58  // useful
59  static bool ReadVR(const char *raw, VR::VRType &type);
60  static bool ReadVM(const char *raw, VM::VMType &type);
61  static bool Readuint16(const char *raw, uint16_t &ov);
62
63  enum OutputTypes {
64      DICT_DEFAULT = 0,
65      DICT_DEBUG,
66      DICT_XML
67  };
68
69 protected:
70  void WriteHeader();
71  void WriteFooter();
72  bool ConvertToXML(const char *raw, std::string &cxx);
73  bool ConvertToCXX(const char *raw, std::string &cxx);
74  void AddGroupLength();
75
76 private:
77  DictConverterInternal *Internal;
78
79  int OutputType;
80 };
81
82 } // end namespace gdcmm
83
84 #endif //GDCMDICTCONVERTER_H

```

## 11.97 gdcmmDictEntry.h File Reference

```

#include "gdcmmVR.h"
#include "gdcmmVM.h"
#include <string>
#include <iostream>
#include <iomanip>

```

Include dependency graph for gdcmmDictEntry.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcmm::DictEntry](#)  
Class to represent an Entry in the *Dict*.

### Namespaces

- namespace [gdcmm](#)



## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const DictEntry &val)`

## 11.98 gdcmDictEntry.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDICTENTRY_H
15 #define GDCMDICTENTRY_H
16
17 #include "gdcmVR.h"
18 #include "gdcmVM.h"
19
20 #include <string>
21 #include <iostream>
22 #include <iomanip>
23
24 namespace gdcm
25 {
26 class GDCM_EXPORT DictEntry
27 {
28 public:
29     DictEntry(const char *name = "", const char *keyword = "", VR const &vr = VR::INVALID, VM const &vm =
        VM::VM0, bool ret = false):
30         Name(name),
31         Keyword(keyword),
32         ValueRepresentation(vr),
33         ValueMultiplicity(vm),
34         Retired(ret),
35         GroupXX(false),
36         ElementXX(false)
37     {
38     }
39
40     friend std::ostream& operator<<(std::ostream& _os, const DictEntry &_val);
41
42     const VR &GetVR()const { return ValueRepresentation; }
43     void SetVR(const VR &vr) { ValueRepresentation = vr; }
44     // bool IsValid()const { return ValueRepresentation != VR::VR_END; }
45     // !Name.empty() /*&& ValueRepresentation && ValueMultiplicity*/; }
46
47     const VM &GetVM()const { return ValueMultiplicity; }
48     void SetVM(VM const &vm) { ValueMultiplicity = vm; }
49
50     const char *GetName()const { return Name.c_str(); }
51     void SetName(const char* name) { Name = name; }
52
53     const char *GetKeyword()const { return Keyword.c_str(); }
54     void SetKeyword(const char* keyword) { Keyword = keyword; }
55
56     bool GetRetired()const { return Retired; }
57     void SetRetired(bool retired) { Retired = retired; }
58
59     // <entry group="50xx" element="0005" vr="US" vm="1" retired="true" version="3">
60     void SetGroupXX(bool v) { GroupXX = v; }
61
62     // <entry group="0020" element="31xx" vr="CS" vm="1-n" retired="true" version="2">
63     void SetElementXX(bool v) { ElementXX = v; }
64
65     bool IsUnique()const { return ElementXX == false && GroupXX == false; }
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85

```

```

86 private:
87     //
88     friend class Dict;
89     static bool CheckKeywordAgainstName(const char *name, const char *keyword);
90
91 private:
92     std::string Name;
93     std::string Keyword;
94     VR ValueRepresentation;
95     VM ValueMultiplicity;
96     bool Retired : 1;
97     bool GroupXX : 1;
98     bool ElementXX : 1;
99 };
100
101 #if 0
102 class GDCM_EXPORT PrivateDictEntry : public DictEntry
103 {
104 public:
105     PrivateDictEntry(const char *name = "", VR::VRType const &vr = VR::INVALID, VM::VMType const &vm = VM::VM0
106         , bool ret = false, const char *owner = ""):DictEntry(name,vr,vm,ret),Owner(owner) {}
107     PrivateDictEntry(const char *name, const char *vr, const char *vm):DictEntry(name,vr,vm) {}
108     const char *GetOwner()const { return Owner.c_str(); }
109     void SetOwner(const char *owner) { Owner = owner; }
110
111 private:
112     // SIEMENS MED, GEMS_PETD_01 ...
113     std::string Owner;
114 };
115 #endif
116
117 //-----
118 inline std::ostream& operator<<(std::ostream& os, const DictEntry &val)
119 {
120     if( val.Name.empty() )
121     {
122         os << "[No name]";
123     }
124     else
125     {
126         os << val.Name;
127     }
128     if( val.Keyword.empty() )
129     {
130         os << "[No keyword]";
131     }
132     else
133     {
134         os << val.Keyword;
135     }
136     os << "\t" << val.ValueRepresentation << "\t" << val.ValueMultiplicity;
137     if( val.Retired )
138     {
139         os << "\t(RET)";
140     }
141     return os;
142 }
143
144 } // end namespace gdcM
145
146 #endif //GDCMDICTENTRY_H

```

## 11.99 gdcMDicts.h File Reference

```

#include "gdcMDict.h"
#include "gdcMCSAHeaderDict.h"
#include <string>

```

Include dependency graph for gdcMDicts.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcM::Dicts](#)

*Class to manipulate the sum of knowledge (all the dict user load)*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Dicts &d)`

## 11.100 gdcmDicts.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDICTS_H
15 #define GDCMDICTS_H
16
17 #include "gdcmDict.h"
18 #include "gdcmCSAHeaderDict.h"
19
20 #include <string>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT Dicts
25     {
26     public:
27         Dicts();
28         ~Dicts();
29         Dicts &operator=(const Dicts &_val) = delete;
30         Dicts(const Dicts &_val) = delete;
31
32         // DataSet::GetPrivateCreator
33         const DictEntry &GetDictEntry(const Tag& tag, const char *owner = nullptr) const;
34
35         const DictEntry &GetDictEntry(const PrivateTag& tag) const;
36
37         //enum PublicTypes {
38         //    DICOMV3_DICT,
39         //    ACRNEMA_DICT,
40         //    NIH_DICT
41         //};
42         const Dict &GetPublicDict() const;
43
44         const PrivateDict &GetPrivateDict() const;
45         PrivateDict &GetPrivateDict();
46
47         const CSAHeaderDict &GetCSAHeaderDict() const;
48
49         bool IsEmpty()const { return GetPublicDict().IsEmpty(); }
50
51 protected:
52     typedef enum {
53         PHILIPS,

```

```

63     GEMS,
64     SIEMENS
65     // ...
66 } ConstructorType;
67 static const char *GetConstructorString(ConstructorType type);
68
69 friend class Global;
70 void LoadDefaults();
71
72 private:
73     // Public dict:
74     Dict PublicDict;
75
76     // Private Dicts:
77     PrivateDict ShadowDict;
78
79     CSAHeaderDict CSADict;
80 };
81 //-----
82 inline std::ostream& operator<<(std::ostream &os, const Dicts &d)
83 {
84     (void)d;
85     return os;
86 }
87
88
89 } // end namespace gdcm
90
91 #endif //GDCMDICTS_H

```

## 11.101 gdcmGlobal.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmGlobal.h:

### Classes

- class [gdcm::Global](#)  
*Global.*

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const Global &g)

### Variables

- static Global [gdcm::GlobalInstance](#)

## 11.102 gdcmGlobal.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 // Implementation detail was shamelessly borrowed from the VTK excellent
15 // implementation of debug leak manager singleton:
16 /*=====
17
18 Program:   Visualization Toolkit
19 Module:    $RCSfile: vtkDebugLeaks.cxx,v $
20
21 Copyright (c) Ken Martin, Will Schroeder, Bill Lorensen
22 All rights reserved.
23 See Copyright.txt or http://www.kitware.com/Copyright.htm for details.
24
25 This software is distributed WITHOUT ANY WARRANTY; without even
26 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 #ifndef GDCMGLOBAL_H
31 #define GDCMGLOBAL_H
32
33 #include "gdcmTypes.h"
34
35 namespace gdcm
36 {
37     class GlobalInternal;
38     class Dicts;
39     class Defs;
40     class GDCM_EXPORT Global // why expose the symbol I think I only need to expose the instance...
41     {
42     friend std::ostream& operator<<(std::ostream &_os, const Global &g);
43     public:
44         Global();
45         ~Global();
46         Global &operator=(const Global &_val) = delete;
47         Global(const Global &_val) = delete;
48
49         Dicts const &GetDicts() const;
50         Dicts &GetDicts();
51
52         Defs const &GetDefs() const;
53
54         static Global& GetInstance();
55
56         bool LoadResourcesFiles();
57
58         bool Append(const char *path);
59
60         bool Prepend(const char *path);
61
62     protected:
63         const char *Locate(const char *resfile) const;
64
65     private:
66         // PIMPL:
67         // but we could have also directly exposed a Dicts *Internals;
68         static GlobalInternal *Internals;
69     };
70 //-----
71 inline std::ostream& operator<<(std::ostream &os, const Global &g)
72 {
73     (void)g;
74     return os;
75 }
76
77
78
79
80

```

```

99 // This instance will show up in any translation unit that uses
100 // Global or that has a singleton.    It will make sure
101 // Global is initialized before it is used and is the last
102 // static object destroyed.
103 static Global GlobalInstance;
104
105 } // end namespace gdcm
106
107 #endif //GDCMGLOBAL_H

```

## 11.103 gdcmGroupDict.h File Reference

```

#include "gdcmTypes.h"
#include <assert.h>
#include <vector>
#include <string>
#include <iostream>
#include <iomanip>

```

Include dependency graph for gdcmGroupDict.h:

### Classes

- class [gdcm::GroupDict](#)  
*Class to represent the mapping from group number to its abbreviation and name.*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const GroupDict &_val)`

## 11.104 gdcmGroupDict.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMGROUPDICT_H
16 #define GDCMGROUPDICT_H
17

```

```

18 #include "gdcmTypes.h"
19
20 #include <assert.h>
21 #include <vector>
22 #include <string>
23 #include <iostream>
24 #include <iomanip>
25
26 namespace gdcm
27 {
28
29 class GDCM_EXPORT GroupDict
30 {
31 public:
32     typedef std::vector<std::string> GroupStringVector;
33     GroupDict() { FillDefaultGroupName(); }
34     ~GroupDict() = default;
35
36     friend std::ostream& operator<<(std::ostream& _os, const GroupDict &_val);
37
38     size_t Size() const
39     {
40         assert( Names.size() == Abbreviations.size() );
41         return Names.size(); }
42
43     std::string const &GetAbbreviation(uint16_t num) const;
44
45     std::string const &GetName(uint16_t num) const;
46
47 protected:
48     void Add(std::string const &abbreviation, std::string const &name);
49     void Insert(uint16_t num, std::string const &abbreviation, std::string const &name);
50 private:
51     // Generated implementation, see gdcmDefaultGroupNames
52     void FillDefaultGroupName();
53
54     GroupDict &operator=(const GroupDict &_val); // purposely not implemented
55     GroupDict(const GroupDict &_val); // purposely not implemented
56
57     GroupStringVector Abbreviations;
58     GroupStringVector Names;
59 };
60
61 //-----
62 inline std::ostream& operator<<(std::ostream& _os, const GroupDict &_val)
63 {
64     size_t size = _val.Size();
65     for(size_t i=0; i<size; ++i)
66     {
67         _os << std::hex << std::setw(4) << std::setfill( '0' ) << i << ", "
68         << _val.GetAbbreviation((uint16_t)i) << ", " << _val.GetName((uint16_t)i) << "\n";
69     }
70     return _os;
71 }
72
73 } // end namespace gdcm
74
75 #endif //GDCMGROUPDICT_H

```

## 11.105 gdcmSOPClassUIDToIOD.h File Reference

```
#include "gdcmUIDs.h"
```

Include dependency graph for gdcmSOPClassUIDToIOD.h:

### Classes

- class [gdcm::SOPClassUIDToIOD](#)

*Class convert a class SOP Class UID into IOD.*

## Namespaces

- namespace [gdcm](#)

## 11.106 gdcmSOPClassUIDToIOD.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMSOPCLASSUIDTOIOD_H
16 #define GDCMSOPCLASSUIDTOIOD_H
17
18 #include "gdcmUIDs.h"
19
20 namespace gdcm
21 {
22
23     class GDCM_EXPORT SOPClassUIDToIOD
24     {
25     public:
26         static const char *GetIOD(UIDs const & uid);
27
28         static unsigned int GetNumberOfSOPClassToIOD();
29
30         typedef const char* const (SOPClassUIDToIODType)[2];
31         static SOPClassUIDToIODType* GetSOPClassUIDToIODs();
32
33         static SOPClassUIDToIODType& GetSOPClassUIDToIOD(unsigned int i);
34
35         static const char *GetSOPClassUIDFromIOD(const char *iod);
36         static const char *GetIODFromSOPClassUID(const char *sopclassuid);
37     };
38
39 } // end namespace gdcm
40
41 #endif //GDCMSOPCLASSUIDTOIOD_H

```

## 11.107 gdcmUIDs.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUIDs.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::UIDs](#)  
*all known uids*



## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const UIDs &uid)`

## 11.108 gdcmUIDs.h

[Go to the documentation of this file.](#)

```

1
2 // GENERATED FILE DO NOT EDIT
3 // $ xsltproc UIDToC++.xsl Part6.xml > gdcmUIDs.h
4
5 /*=====
6
7 Program:  GDCM (Grassroots DICOM). A DICOM library
8
9 Copyright (c) 2006-2011 Mathieu Malaterre
10 All rights reserved.
11 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
12
13 This software is distributed WITHOUT ANY WARRANTY; without even
14 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
15 PURPOSE.  See the above copyright notice for more information.
16
17 =====*/
18
19 #ifndef GDCMUIDS_H
20 #define GDCMUIDS_H
21
22 #include "gdcmTypes.h"
23
24 namespace gdcm
25 {
26
27     class GDCM_EXPORT UIDs
28     {
29     public:
30         typedef enum {
31             uid_1_2_840_10008_1_1 = 1, // Verification SOP Class
32             uid_1_2_840_10008_1_2 = 2, // Implicit VR Little Endian: Default Transfer Syntax for DICOM
33             uid_1_2_840_10008_1_2_1 = 3, // Explicit VR Little Endian
34             uid_1_2_840_10008_1_2_1_99 = 4, // Deflated Explicit VR Little Endian
35             uid_1_2_840_10008_1_2_2 = 5, // Explicit VR Big Endian
36             uid_1_2_840_10008_1_2_4_50 = 6, // JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit
37             // Image Compression
38             uid_1_2_840_10008_1_2_4_51 = 7, // JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12
39             // Bit Image Compression (Process 4 only)
40             uid_1_2_840_10008_1_2_4_52 = 8, // JPEG Extended (Process 3 & 5)
41             uid_1_2_840_10008_1_2_4_53 = 9, // JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8)
42             uid_1_2_840_10008_1_2_4_54 = 10, // JPEG Spectral Selection, Non-Hierarchical (Process 7 & 9)
43             uid_1_2_840_10008_1_2_4_55 = 11, // JPEG Full Progression, Non-Hierarchical (Process 10 & 12)
44             uid_1_2_840_10008_1_2_4_56 = 12, // JPEG Full Progression, Non-Hierarchical (Process 11 & 13)
45             uid_1_2_840_10008_1_2_4_57 = 13, // JPEG Lossless, Non-Hierarchical (Process 14)
46             uid_1_2_840_10008_1_2_4_58 = 14, // JPEG Lossless, Non-Hierarchical (Process 15)
47             uid_1_2_840_10008_1_2_4_59 = 15, // JPEG Extended, Hierarchical (Process 16 & 18)
48             uid_1_2_840_10008_1_2_4_60 = 16, // JPEG Extended, Hierarchical (Process 17 & 19)
49             uid_1_2_840_10008_1_2_4_61 = 17, // JPEG Spectral Selection, Hierarchical (Process 20 & 22)
50             uid_1_2_840_10008_1_2_4_62 = 18, // JPEG Spectral Selection, Hierarchical (Process 21 & 23)
51             uid_1_2_840_10008_1_2_4_63 = 19, // JPEG Full Progression, Hierarchical (Process 24 & 26)
52             uid_1_2_840_10008_1_2_4_64 = 20, // JPEG Full Progression, Hierarchical (Process 25 & 27)
53             uid_1_2_840_10008_1_2_4_65 = 21, // JPEG Lossless, Hierarchical (Process 28)
54             uid_1_2_840_10008_1_2_4_66 = 22, // JPEG Lossless, Hierarchical (Process 29)
55             uid_1_2_840_10008_1_2_4_70 = 23, // JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14
56             // [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression
57             uid_1_2_840_10008_1_2_4_80 = 24, // JPEG-LS Lossless Image Compression
58             uid_1_2_840_10008_1_2_4_81 = 25, // JPEG-LS Lossy (Near-Lossless) Image Compression
59             uid_1_2_840_10008_1_2_4_90 = 26, // JPEG 2000 Image Compression (Lossless Only)

```

```
60 uid_1_2_840_10008_1_2_4_91 = 27, // JPEG 2000 Image Compression
61 uid_1_2_840_10008_1_2_4_92 = 28, // JPEG 2000 Part 2 Multi-component Image Compression (Lossless Only)
62 uid_1_2_840_10008_1_2_4_93 = 29, // JPEG 2000 Part 2 Multi-component Image Compression
63 uid_1_2_840_10008_1_2_4_94 = 30, // JPIP Referenced
64 uid_1_2_840_10008_1_2_4_95 = 31, // JPIP Referenced Deflate
65 uid_1_2_840_10008_1_2_4_100 = 32, // MPEG2 Main Profile @ Main Level
66 uid_1_2_840_10008_1_2_5 = 33, // RLE Lossless
67 uid_1_2_840_10008_1_2_6_1 = 34, // RFC 2557 MIME encapsulation
68 uid_1_2_840_10008_1_2_6_2 = 35, // XML Encoding
69 uid_1_2_840_10008_1_3_10 = 36, // Media Storage Directory Storage
70 uid_1_2_840_10008_1_4_1_1 = 37, // Talairach Brain Atlas Frame of Reference
71 uid_1_2_840_10008_1_4_1_2 = 38, // SPM2 T1 Frame of Reference
72 uid_1_2_840_10008_1_4_1_3 = 39, // SPM2 T2 Frame of Reference
73 uid_1_2_840_10008_1_4_1_4 = 40, // SPM2 PD Frame of Reference
74 uid_1_2_840_10008_1_4_1_5 = 41, // SPM2 EPI Frame of Reference
75 uid_1_2_840_10008_1_4_1_6 = 42, // SPM2 FIL T1 Frame of Reference
76 uid_1_2_840_10008_1_4_1_7 = 43, // SPM2 PET Frame of Reference
77 uid_1_2_840_10008_1_4_1_8 = 44, // SPM2 TRANSM Frame of Reference
78 uid_1_2_840_10008_1_4_1_9 = 45, // SPM2 SPECT Frame of Reference
79 uid_1_2_840_10008_1_4_1_10 = 46, // SPM2 GRAY Frame of Reference
80 uid_1_2_840_10008_1_4_1_11 = 47, // SPM2 WHITE Frame of Reference
81 uid_1_2_840_10008_1_4_1_12 = 48, // SPM2 CSF Frame of Reference
82 uid_1_2_840_10008_1_4_1_13 = 49, // SPM2 BRAINMASK Frame of Reference
83 uid_1_2_840_10008_1_4_1_14 = 50, // SPM2 AVG305T1 Frame of Reference
84 uid_1_2_840_10008_1_4_1_15 = 51, // SPM2 AVG152T1 Frame of Reference
85 uid_1_2_840_10008_1_4_1_16 = 52, // SPM2 AVG152T2 Frame of Reference
86 uid_1_2_840_10008_1_4_1_17 = 53, // SPM2 AVG152PD Frame of Reference
87 uid_1_2_840_10008_1_4_1_18 = 54, // SPM2 SINGLESUBJT1 Frame of Reference
88 uid_1_2_840_10008_1_4_2_1 = 55, // ICBM 452 T1 Frame of Reference
89 uid_1_2_840_10008_1_4_2_2 = 56, // ICBM Single Subject MRI Frame of Reference
90 uid_1_2_840_10008_1_9 = 57, // Basic Study Content Notification SOP Class
91 uid_1_2_840_10008_1_20_1 = 58, // Storage Commitment Push Model SOP Class
92 uid_1_2_840_10008_1_20_1_1 = 59, // Storage Commitment Push Model SOP Instance
93 uid_1_2_840_10008_1_20_2 = 60, // Storage Commitment Pull Model SOP Class
94 uid_1_2_840_10008_1_20_2_1 = 61, // Storage Commitment Pull Model SOP Instance
95 uid_1_2_840_10008_1_40 = 62, // Procedural Event Logging SOP Class
96 uid_1_2_840_10008_1_40_1 = 63, // Procedural Event Logging SOP Instance
97 uid_1_2_840_10008_1_42 = 64, // Substance Administration Logging SOP Class
98 uid_1_2_840_10008_1_42_1 = 65, // Substance Administration Logging SOP Instance
99 uid_1_2_840_10008_2_6_1 = 66, // DICOM UID Registry
100 uid_1_2_840_10008_2_16_4 = 67, // DICOM Controlled Terminology
101 uid_1_2_840_10008_3_1_1_1 = 68, // DICOM Application Context Name
102 uid_1_2_840_10008_3_1_2_1_1 = 69, // Detached Patient Management SOP Class
103 uid_1_2_840_10008_3_1_2_1_4 = 70, // Detached Patient Management Meta SOP Class
104 uid_1_2_840_10008_3_1_2_2_1 = 71, // Detached Visit Management SOP Class
105 uid_1_2_840_10008_3_1_2_3_1 = 72, // Detached Study Management SOP Class
106 uid_1_2_840_10008_3_1_2_3_2 = 73, // Study Component Management SOP Class
107 uid_1_2_840_10008_3_1_2_3_3 = 74, // Modality Performed Procedure Step SOP Class
108 uid_1_2_840_10008_3_1_2_3_4 = 75, // Modality Performed Procedure Step Retrieve SOP Class
109 uid_1_2_840_10008_3_1_2_3_5 = 76, // Modality Performed Procedure Step Notification SOP Class
110 uid_1_2_840_10008_3_1_2_5_1 = 77, // Detached Results Management SOP Class
111 uid_1_2_840_10008_3_1_2_5_4 = 78, // Detached Results Management Meta SOP Class
112 uid_1_2_840_10008_3_1_2_5_5 = 79, // Detached Study Management Meta SOP Class
113 uid_1_2_840_10008_3_1_2_6_1 = 80, // Detached Interpretation Management SOP Class
114 uid_1_2_840_10008_4_2 = 81, // Storage Service Class
115 uid_1_2_840_10008_5_1_1_1 = 82, // Basic Film Session SOP Class
116 uid_1_2_840_10008_5_1_1_2 = 83, // Basic Film Box SOP Class
117 uid_1_2_840_10008_5_1_1_4 = 84, // Basic Grayscale Image Box SOP Class
118 uid_1_2_840_10008_5_1_1_4_1 = 85, // Basic Color Image Box SOP Class
119 uid_1_2_840_10008_5_1_1_4_2 = 86, // Referenced Image Box SOP Class
120 uid_1_2_840_10008_5_1_1_9 = 87, // Basic Grayscale Print Management Meta SOP Class
121 uid_1_2_840_10008_5_1_1_9_1 = 88, // Referenced Grayscale Print Management Meta SOP Class
122 uid_1_2_840_10008_5_1_1_14 = 89, // Print Job SOP Class
123 uid_1_2_840_10008_5_1_1_15 = 90, // Basic Annotation Box SOP Class
124 uid_1_2_840_10008_5_1_1_16 = 91, // Printer SOP Class
125 uid_1_2_840_10008_5_1_1_16_376 = 92, // Printer Configuration Retrieval SOP Class
126 uid_1_2_840_10008_5_1_1_17 = 93, // Printer SOP Instance
127 uid_1_2_840_10008_5_1_1_17_376 = 94, // Printer Configuration Retrieval SOP Instance
128 uid_1_2_840_10008_5_1_1_18 = 95, // Basic Color Print Management Meta SOP Class
129 uid_1_2_840_10008_5_1_1_18_1 = 96, // Referenced Color Print Management Meta SOP Class
130 uid_1_2_840_10008_5_1_1_22 = 97, // VOI LUT Box SOP Class
131 uid_1_2_840_10008_5_1_1_23 = 98, // Presentation LUT SOP Class
132 uid_1_2_840_10008_5_1_1_24 = 99, // Image Overlay Box SOP Class
133 uid_1_2_840_10008_5_1_1_24_1 = 100, // Basic Print Image Overlay Box SOP Class
134 uid_1_2_840_10008_5_1_1_25 = 101, // Print Queue SOP Instance
135 uid_1_2_840_10008_5_1_1_26 = 102, // Print Queue Management SOP Class
136 uid_1_2_840_10008_5_1_1_27 = 103, // Stored Print Storage SOP Class
137 uid_1_2_840_10008_5_1_1_29 = 104, // Hardcopy Grayscale Image Storage SOP Class
138 uid_1_2_840_10008_5_1_1_30 = 105, // Hardcopy Color Image Storage SOP Class
139 uid_1_2_840_10008_5_1_1_31 = 106, // Pull Print Request SOP Class
140 uid_1_2_840_10008_5_1_1_32 = 107, // Pull Stored Print Management Meta SOP Class
```

```
141 uid_1_2_840_10008_5_1_1_33 = 108, // Media Creation Management SOP Class UID
142 uid_1_2_840_10008_5_1_4_1_1_1 = 109, // Computed Radiography Image Storage
143 uid_1_2_840_10008_5_1_4_1_1_1_1 = 110, // Digital X-Ray Image Storage - For Presentation
144 uid_1_2_840_10008_5_1_4_1_1_1_1_1 = 111, // Digital X-Ray Image Storage - For Processing
145 uid_1_2_840_10008_5_1_4_1_1_1_2 = 112, // Digital Mammography X-Ray Image Storage - For Presentation
146 uid_1_2_840_10008_5_1_4_1_1_1_2_1 = 113, // Digital Mammography X-Ray Image Storage - For Processing
147 uid_1_2_840_10008_5_1_4_1_1_1_3 = 114, // Digital Intra-oral X-Ray Image Storage - For Presentation
148 uid_1_2_840_10008_5_1_4_1_1_1_3_1 = 115, // Digital Intra-oral X-Ray Image Storage - For Processing
149 uid_1_2_840_10008_5_1_4_1_1_2 = 116, // CT Image Storage
150 uid_1_2_840_10008_5_1_4_1_1_2_1 = 117, // Enhanced CT Image Storage
151 uid_1_2_840_10008_5_1_4_1_1_3 = 118, // Ultrasound Multi-frame Image Storage
152 uid_1_2_840_10008_5_1_4_1_1_3_1 = 119, // Ultrasound Multi-frame Image Storage
153 uid_1_2_840_10008_5_1_4_1_1_4 = 120, // MR Image Storage
154 uid_1_2_840_10008_5_1_4_1_1_4_1 = 121, // Enhanced MR Image Storage
155 uid_1_2_840_10008_5_1_4_1_1_4_2 = 122, // MR Spectroscopy Storage
156 uid_1_2_840_10008_5_1_4_1_1_5 = 123, // Nuclear Medicine Image Storage
157 uid_1_2_840_10008_5_1_4_1_1_6 = 124, // Ultrasound Image Storage
158 uid_1_2_840_10008_5_1_4_1_1_6_1 = 125, // Ultrasound Image Storage
159 uid_1_2_840_10008_5_1_4_1_1_7 = 126, // Secondary Capture Image Storage
160 uid_1_2_840_10008_5_1_4_1_1_7_1 = 127, // Multi-frame Single Bit Secondary Capture Image Storage
161 uid_1_2_840_10008_5_1_4_1_1_7_2 = 128, // Multi-frame Grayscale Byte Secondary Capture Image Storage
162 uid_1_2_840_10008_5_1_4_1_1_7_3 = 129, // Multi-frame Grayscale Word Secondary Capture Image Storage
163 uid_1_2_840_10008_5_1_4_1_1_7_4 = 130, // Multi-frame True Color Secondary Capture Image Storage
164 uid_1_2_840_10008_5_1_4_1_1_8 = 131, // Standalone Overlay Storage
165 uid_1_2_840_10008_5_1_4_1_1_9 = 132, // Standalone Curve Storage
166 uid_1_2_840_10008_5_1_4_1_1_9_1 = 133, // Waveform Storage - Trial
167 uid_1_2_840_10008_5_1_4_1_1_9_1_1 = 134, // 12-lead ECG Waveform Storage
168 uid_1_2_840_10008_5_1_4_1_1_9_1_2 = 135, // General ECG Waveform Storage
169 uid_1_2_840_10008_5_1_4_1_1_9_1_3 = 136, // Ambulatory ECG Waveform Storage
170 uid_1_2_840_10008_5_1_4_1_1_9_2_1 = 137, // Hemodynamic Waveform Storage
171 uid_1_2_840_10008_5_1_4_1_1_9_3_1 = 138, // Cardiac Electrophysiology Waveform Storage
172 uid_1_2_840_10008_5_1_4_1_1_9_4_1 = 139, // Basic Voice Audio Waveform Storage
173 uid_1_2_840_10008_5_1_4_1_1_10 = 140, // Standalone Modality LUT Storage
174 uid_1_2_840_10008_5_1_4_1_1_11 = 141, // Standalone VOI LUT Storage
175 uid_1_2_840_10008_5_1_4_1_1_11_1 = 142, // Grayscale Softcopy Presentation State Storage SOP Class
176 uid_1_2_840_10008_5_1_4_1_1_11_2 = 143, // Color Softcopy Presentation State Storage SOP Class
177 uid_1_2_840_10008_5_1_4_1_1_11_3 = 144, // Pseudo-Color Softcopy Presentation State Storage SOP Class
178 uid_1_2_840_10008_5_1_4_1_1_11_4 = 145, // Blending Softcopy Presentation State Storage SOP Class
179 uid_1_2_840_10008_5_1_4_1_1_12_1 = 146, // X-Ray Angiographic Image Storage
180 uid_1_2_840_10008_5_1_4_1_1_12_1_1 = 147, // Enhanced XA Image Storage
181 uid_1_2_840_10008_5_1_4_1_1_12_2 = 148, // X-Ray Radiofluoroscopic Image Storage
182 uid_1_2_840_10008_5_1_4_1_1_12_2_1 = 149, // Enhanced XRF Image Storage
183 uid_1_2_840_10008_5_1_4_1_1_13_1_1 = 150, // X-Ray 3D Angiographic Image Storage
184 uid_1_2_840_10008_5_1_4_1_1_13_1_2 = 151, // X-Ray 3D Craniofacial Image Storage
185 uid_1_2_840_10008_5_1_4_1_1_12_3 = 152, // X-Ray Angiographic Bi-Plane Image Storage
186 uid_1_2_840_10008_5_1_4_1_1_20 = 153, // Nuclear Medicine Image Storage
187 uid_1_2_840_10008_5_1_4_1_1_66 = 154, // Raw Data Storage
188 uid_1_2_840_10008_5_1_4_1_1_66_1 = 155, // Spatial Registration Storage
189 uid_1_2_840_10008_5_1_4_1_1_66_2 = 156, // Spatial Fiducials Storage
190 uid_1_2_840_10008_5_1_4_1_1_66_3 = 157, // Deformable Spatial Registration Storage
191 uid_1_2_840_10008_5_1_4_1_1_66_4 = 158, // Segmentation Storage
192 uid_1_2_840_10008_5_1_4_1_1_67 = 159, // Real World Value Mapping Storage
193 uid_1_2_840_10008_5_1_4_1_1_77_1 = 160, // VL Image Storage - Trial
194 uid_1_2_840_10008_5_1_4_1_1_77_2 = 161, // VL Multi-frame Image Storage - Trial
195 uid_1_2_840_10008_5_1_4_1_1_77_1_1 = 162, // VL Endoscopic Image Storage
196 uid_1_2_840_10008_5_1_4_1_1_77_1_1_1 = 163, // Video Endoscopic Image Storage
197 uid_1_2_840_10008_5_1_4_1_1_77_1_2 = 164, // VL Microscopic Image Storage
198 uid_1_2_840_10008_5_1_4_1_1_77_1_2_1 = 165, // Video Microscopic Image Storage
199 uid_1_2_840_10008_5_1_4_1_1_77_1_3 = 166, // VL Slide-Coordinates Microscopic Image Storage
200 uid_1_2_840_10008_5_1_4_1_1_77_1_4 = 167, // VL Photographic Image Storage
201 uid_1_2_840_10008_5_1_4_1_1_77_1_4_1 = 168, // Video Photographic Image Storage
202 uid_1_2_840_10008_5_1_4_1_1_77_1_5_1 = 169, // Ophthalmic Photography 8 Bit Image Storage
203 uid_1_2_840_10008_5_1_4_1_1_77_1_5_2 = 170, // Ophthalmic Photography 16 Bit Image Storage
204 uid_1_2_840_10008_5_1_4_1_1_77_1_5_3 = 171, // Stereometric Relationship Storage
205 uid_1_2_840_10008_5_1_4_1_1_77_1_5_4 = 172, // Ophthalmic Tomography Image Storage
206 uid_1_2_840_10008_5_1_4_1_1_88_1 = 173, // Text SR Storage - Trial
207 uid_1_2_840_10008_5_1_4_1_1_88_2 = 174, // Audio SR Storage - Trial
208 uid_1_2_840_10008_5_1_4_1_1_88_3 = 175, // Detail SR Storage - Trial
209 uid_1_2_840_10008_5_1_4_1_1_88_4 = 176, // Comprehensive SR Storage - Trial
210 uid_1_2_840_10008_5_1_4_1_1_88_11 = 177, // Basic Text SR Storage
211 uid_1_2_840_10008_5_1_4_1_1_88_22 = 178, // Enhanced SR Storage
212 uid_1_2_840_10008_5_1_4_1_1_88_33 = 179, // Comprehensive SR Storage
213 uid_1_2_840_10008_5_1_4_1_1_88_40 = 180, // Procedure Log Storage
214 uid_1_2_840_10008_5_1_4_1_1_88_50 = 181, // Mammography CAD SR Storage
215 uid_1_2_840_10008_5_1_4_1_1_88_59 = 182, // Key Object Selection Document Storage
216 uid_1_2_840_10008_5_1_4_1_1_88_65 = 183, // Chest CAD SR Storage
217 uid_1_2_840_10008_5_1_4_1_1_88_67 = 184, // X-Ray Radiation Dose SR Storage
218 uid_1_2_840_10008_5_1_4_1_1_104_1 = 185, // Encapsulated PDF Storage
219 uid_1_2_840_10008_5_1_4_1_1_104_2 = 186, // Encapsulated CDA Storage
220 uid_1_2_840_10008_5_1_4_1_1_128 = 187, // Positron Emission Tomography Image Storage
221 uid_1_2_840_10008_5_1_4_1_1_129 = 188, // Standalone PET Curve Storage
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222 uid_1_2_840_10008_5_1_4_1_1_481_1 = 189, // RT Image Storage
223 uid_1_2_840_10008_5_1_4_1_1_481_2 = 190, // RT Dose Storage
224 uid_1_2_840_10008_5_1_4_1_1_481_3 = 191, // RT Structure Set Storage
225 uid_1_2_840_10008_5_1_4_1_1_481_4 = 192, // RT Beams Treatment Record Storage
226 uid_1_2_840_10008_5_1_4_1_1_481_5 = 193, // RT Plan Storage
227 uid_1_2_840_10008_5_1_4_1_1_481_6 = 194, // RT Brachy Treatment Record Storage
228 uid_1_2_840_10008_5_1_4_1_1_481_7 = 195, // RT Treatment Summary Record Storage
229 uid_1_2_840_10008_5_1_4_1_1_481_8 = 196, // RT Ion Plan Storage
230 uid_1_2_840_10008_5_1_4_1_1_481_9 = 197, // RT Ion Beams Treatment Record Storage
231 uid_1_2_840_10008_5_1_4_1_2_1_1 = 198, // Patient Root Query/Retrieve Information Model - FIND
232 uid_1_2_840_10008_5_1_4_1_2_1_2 = 199, // Patient Root Query/Retrieve Information Model - MOVE
233 uid_1_2_840_10008_5_1_4_1_2_1_3 = 200, // Patient Root Query/Retrieve Information Model - GET
234 uid_1_2_840_10008_5_1_4_1_2_2_1 = 201, // Study Root Query/Retrieve Information Model - FIND
235 uid_1_2_840_10008_5_1_4_1_2_2_2 = 202, // Study Root Query/Retrieve Information Model - MOVE
236 uid_1_2_840_10008_5_1_4_1_2_2_3 = 203, // Study Root Query/Retrieve Information Model - GET
237 uid_1_2_840_10008_5_1_4_1_2_3_1 = 204, // Patient/Study Only Query/Retrieve Information Model - FIND
238 uid_1_2_840_10008_5_1_4_1_2_3_2 = 205, // Patient/Study Only Query/Retrieve Information Model - MOVE
239 uid_1_2_840_10008_5_1_4_1_2_3_3 = 206, // Patient/Study Only Query/Retrieve Information Model - GET
240 uid_1_2_840_10008_5_1_4_31 = 207, // Modality Worklist Information Model - FIND
241 uid_1_2_840_10008_5_1_4_32_1 = 208, // General Purpose Worklist Information Model - FIND
242 uid_1_2_840_10008_5_1_4_32_2 = 209, // General Purpose Scheduled Procedure Step SOP Class
243 uid_1_2_840_10008_5_1_4_32_3 = 210, // General Purpose Performed Procedure Step SOP Class
244 uid_1_2_840_10008_5_1_4_32 = 211, // General Purpose Worklist Management Meta SOP Class
245 uid_1_2_840_10008_5_1_4_33 = 212, // Instance Availability Notification SOP Class
246 uid_1_2_840_10008_5_1_4_34_1 = 213, // RT Beams Delivery Instruction Storage (Supplement 74 Frozen Draft)
247 uid_1_2_840_10008_5_1_4_34_2 = 214, // RT Conventional Machine Verification (Supplement 74 Frozen Draft)
248 uid_1_2_840_10008_5_1_4_34_3 = 215, // RT Ion Machine Verification (Supplement 74 Frozen Draft)
249 uid_1_2_840_10008_5_1_4_34_4 = 216, // Unified Worklist and Procedure Step Service Class
250 uid_1_2_840_10008_5_1_4_34_4_1 = 217, // Unified Procedure Step - Push SOP Class
251 uid_1_2_840_10008_5_1_4_34_4_2 = 218, // Unified Procedure Step - Watch SOP Class
252 uid_1_2_840_10008_5_1_4_34_4_3 = 219, // Unified Procedure Step - Pull SOP Class
253 uid_1_2_840_10008_5_1_4_34_4_4 = 220, // Unified Procedure Step - Event SOP Class
254 uid_1_2_840_10008_5_1_4_34_5 = 221, // Unified Worklist and Procedure Step SOP Instance
255 uid_1_2_840_10008_5_1_4_37_1 = 222, // General Relevant Patient Information Query
256 uid_1_2_840_10008_5_1_4_37_2 = 223, // Breast Imaging Relevant Patient Information Query
257 uid_1_2_840_10008_5_1_4_37_3 = 224, // Cardiac Relevant Patient Information Query
258 uid_1_2_840_10008_5_1_4_38_1 = 225, // Hanging Protocol Storage
259 uid_1_2_840_10008_5_1_4_38_2 = 226, // Hanging Protocol Information Model - FIND
260 uid_1_2_840_10008_5_1_4_38_3 = 227, // Hanging Protocol Information Model - MOVE
261 uid_1_2_840_10008_5_1_4_41 = 228, // Product Characteristics Query SOP Class
262 uid_1_2_840_10008_5_1_4_42 = 229, // Substance Approval Query SOP Class
263 uid_1_2_840_10008_15_0_3_1 = 230, // dicomDeviceName
264 uid_1_2_840_10008_15_0_3_2 = 231, // dicomDescription
265 uid_1_2_840_10008_15_0_3_3 = 232, // dicomManufacturer
266 uid_1_2_840_10008_15_0_3_4 = 233, // dicomManufacturerModelName
267 uid_1_2_840_10008_15_0_3_5 = 234, // dicomSoftwareVersion
268 uid_1_2_840_10008_15_0_3_6 = 235, // dicomVendorData
269 uid_1_2_840_10008_15_0_3_7 = 236, // dicomAETitle
270 uid_1_2_840_10008_15_0_3_8 = 237, // dicomNetworkConnectionReference
271 uid_1_2_840_10008_15_0_3_9 = 238, // dicomApplicationCluster
272 uid_1_2_840_10008_15_0_3_10 = 239, // dicomAssociationInitiator
273 uid_1_2_840_10008_15_0_3_11 = 240, // dicomAssociationAcceptor
274 uid_1_2_840_10008_15_0_3_12 = 241, // dicomHostname
275 uid_1_2_840_10008_15_0_3_13 = 242, // dicomPort
276 uid_1_2_840_10008_15_0_3_14 = 243, // dicomSOPClass
277 uid_1_2_840_10008_15_0_3_15 = 244, // dicomTransferRole
278 uid_1_2_840_10008_15_0_3_16 = 245, // dicomTransferSyntax
279 uid_1_2_840_10008_15_0_3_17 = 246, // dicomPrimaryDeviceType
280 uid_1_2_840_10008_15_0_3_18 = 247, // dicomRelatedDeviceReference
281 uid_1_2_840_10008_15_0_3_19 = 248, // dicomPreferredCalledAETitle
282 uid_1_2_840_10008_15_0_3_20 = 249, // dicomTLSCyphersuite
283 uid_1_2_840_10008_15_0_3_21 = 250, // dicomAuthorizedNodeCertificateReference
284 uid_1_2_840_10008_15_0_3_22 = 251, // dicomThisNodeCertificateReference
285 uid_1_2_840_10008_15_0_3_23 = 252, // dicomInstalled
286 uid_1_2_840_10008_15_0_3_24 = 253, // dicomStationName
287 uid_1_2_840_10008_15_0_3_25 = 254, // dicomDeviceSerialNumber
288 uid_1_2_840_10008_15_0_3_26 = 255, // dicomInstitutionName
289 uid_1_2_840_10008_15_0_3_27 = 256, // dicomInstitutionAddress
290 uid_1_2_840_10008_15_0_3_28 = 257, // dicomInstitutionDepartmentName
291 uid_1_2_840_10008_15_0_3_29 = 258, // dicomIssuerOfPatientID
292 uid_1_2_840_10008_15_0_3_30 = 259, // dicomPreferredCallingAETitle
293 uid_1_2_840_10008_15_0_3_31 = 260, // dicomSupportedCharacterSet
294 uid_1_2_840_10008_15_0_4_1 = 261, // dicomConfigurationRoot
295 uid_1_2_840_10008_15_0_4_2 = 262, // dicomDevicesRoot
296 uid_1_2_840_10008_15_0_4_3 = 263, // dicomUniqueAETitlesRegistryRoot
297 uid_1_2_840_10008_15_0_4_4 = 264, // dicomDevice
298 uid_1_2_840_10008_15_0_4_5 = 265, // dicomNetworkAE
299 uid_1_2_840_10008_15_0_4_6 = 266, // dicomNetworkConnection
300 uid_1_2_840_10008_15_0_4_7 = 267, // dicomUniqueAETitle
301 uid_1_2_840_10008_15_0_4_8 = 268, // dicomTransferCapability
302 //
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303 uid_1_2_840_10008_5_1_4_1_1_77_1_6 = 269, // VL Whole Slide Microscopy
304 uid_1_2_840_10008_5_1_4_1_1_6_2 = 270, // Enhanced US Volume Storage
305 uid_1_2_840_10008_5_1_4_1_1_66_5 = 271, // Surface Segmentation Storage
306 uid_1_2_840_10008_5_1_4_1_1_13_1_3 = 272, // Breast Tomosynthesis Image Storage
307 uid_1_2_840_10008_5_1_4_1_1_2_2 = 273, // Legacy Converted Enhanced CT
308 uid_1_2_840_10008_5_1_4_1_1_4_4 = 274, // Legacy Converted Enhanced MR
309 uid_1_2_840_10008_5_1_4_1_1_128_1 = 275, // Legacy Converted Enhanced PET
310 uid_1_2_840_10008_1_2_4_101 = 276, // MPEG2 Main Profile High Level
311 uid_1_2_840_10008_1_2_4_102 = 277, // MPEG-4 AVC/H.264 High Profile Lev. 4.1
312 uid_1_2_840_10008_1_2_4_103 = 278, // MPEG-4 AVC/H.264 BD-comp High Profile Lev. 4.1
313
315 //
316 // 2019b
317 //
318 uid_1_2_840_10008_1_5_2 = 279,
319 uid_1_2_840_10008_1_5_3 = 280,
320 uid_1_2_840_10008_1_5_4 = 281,
321 uid_1_2_840_10008_1_5_5 = 282,
322 uid_1_2_840_10008_1_5_6 = 283,
323 uid_1_2_840_10008_1_5_7 = 284,
324 uid_1_2_840_10008_1_5_8 = 285,
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327 uid_1_2_840_10008_2_16_6 = 288,
328 uid_1_2_840_10008_2_16_7 = 289,
329 uid_1_2_840_10008_2_16_8 = 290,
330 uid_1_2_840_10008_2_16_9 = 291,
331 uid_1_2_840_10008_2_16_10 = 292,
332 uid_1_2_840_10008_2_16_11 = 293,
333 uid_1_2_840_10008_2_16_12 = 294,
334 uid_1_2_840_10008_2_16_13 = 295,
335 uid_1_2_840_10008_2_16_14 = 296,
336 uid_1_2_840_10008_5_1_1_40 = 297,
337 uid_1_2_840_10008_5_1_1_40_1 = 298,
338 uid_1_2_840_10008_5_1_4_1_1_9_4_2 = 299,
339 uid_1_2_840_10008_5_1_4_1_1_9_5_1 = 300,
340 uid_1_2_840_10008_5_1_4_1_1_9_6_1 = 301,
341 uid_1_2_840_10008_5_1_4_1_1_11_5 = 302,
342 uid_1_2_840_10008_5_1_4_1_1_11_6 = 303,
343 uid_1_2_840_10008_1_2_4_104 = 304,
344 uid_1_2_840_10008_1_2_4_105 = 305,
345 uid_1_2_840_10008_1_2_4_106 = 306,
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347 uid_1_2_840_10008_1_2_4_108 = 308,
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352 uid_1_2_840_10008_5_1_4_1_1_11_10 = 313,
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356 uid_1_2_840_10008_5_1_4_1_1_13_1_5 = 317,
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358 uid_1_2_840_10008_5_1_4_1_1_14_2 = 319,
359 uid_1_2_840_10008_5_1_4_1_1_30 = 320,
360 uid_1_2_840_10008_5_1_4_1_1_40 = 321,
361 uid_1_2_840_10008_5_1_4_1_1_66_6 = 322,
362 uid_1_2_840_10008_5_1_4_1_1_68_1 = 323,
363 uid_1_2_840_10008_5_1_4_1_1_68_2 = 324,
364 uid_1_2_840_10008_5_1_4_1_1_77_1_5_5 = 325,
365 uid_1_2_840_10008_5_1_4_1_1_77_1_5_6 = 326,
366 uid_1_2_840_10008_5_1_4_1_1_77_1_5_7 = 327,
367 uid_1_2_840_10008_5_1_4_1_1_77_1_5_8 = 328,
368 uid_1_2_840_10008_5_1_4_1_1_78_1 = 329,
369 uid_1_2_840_10008_5_1_4_1_1_78_2 = 330,
370 uid_1_2_840_10008_5_1_4_1_1_78_3 = 331,
371 uid_1_2_840_10008_5_1_4_1_1_78_4 = 332,
372 uid_1_2_840_10008_5_1_4_1_1_78_5 = 333,
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374 uid_1_2_840_10008_5_1_4_1_1_78_7 = 335,
375 uid_1_2_840_10008_5_1_4_1_1_78_8 = 336,
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377 uid_1_2_840_10008_5_1_4_1_1_80_1 = 338,
378 uid_1_2_840_10008_5_1_4_1_1_81_1 = 339,
379 uid_1_2_840_10008_5_1_4_1_1_82_1 = 340,
380 uid_1_2_840_10008_5_1_4_1_1_88_34 = 341,
381 uid_1_2_840_10008_5_1_4_1_1_88_35 = 342,
382 uid_1_2_840_10008_5_1_4_1_1_88_68 = 343,
383 uid_1_2_840_10008_5_1_4_1_1_88_69 = 344,
384 uid_1_2_840_10008_5_1_4_1_1_88_70 = 345,
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385 uid_1_2_840_10008_5_1_4_1_1_88_71 = 346,
386 uid_1_2_840_10008_5_1_4_1_1_88_72 = 347,
387 uid_1_2_840_10008_5_1_4_1_1_88_73 = 348,
388 uid_1_2_840_10008_5_1_4_1_1_88_74 = 349,
389 uid_1_2_840_10008_5_1_4_1_1_88_75 = 350,
390 uid_1_2_840_10008_5_1_4_1_1_90_1 = 351,
391 uid_1_2_840_10008_5_1_4_1_1_104_3 = 352,
392 uid_1_2_840_10008_5_1_4_1_1_130 = 353,
393 uid_1_2_840_10008_5_1_4_1_1_131 = 354,
394 uid_1_2_840_10008_5_1_4_1_1_200_1 = 355,
395 uid_1_2_840_10008_5_1_4_1_1_200_2 = 356,
396 uid_1_2_840_10008_5_1_4_1_1_200_3 = 357,
397 uid_1_2_840_10008_5_1_4_1_1_200_4 = 358,
398 uid_1_2_840_10008_5_1_4_1_1_200_5 = 359,
399 uid_1_2_840_10008_5_1_4_1_1_200_6 = 360,
400 uid_1_2_840_10008_5_1_4_1_1_481_10 = 361,
401 uid_1_2_840_10008_5_1_4_1_1_481_11 = 362,
402 uid_1_2_840_10008_5_1_4_1_1_501_1 = 363,
403 uid_1_2_840_10008_5_1_4_1_1_501_2_1 = 364,
404 uid_1_2_840_10008_5_1_4_1_1_501_2_2 = 365,
405 uid_1_2_840_10008_5_1_4_1_1_501_3 = 366,
406 uid_1_2_840_10008_5_1_4_1_1_501_4 = 367,
407 uid_1_2_840_10008_5_1_4_1_1_501_5 = 368,
408 uid_1_2_840_10008_5_1_4_1_1_501_6 = 369,
409 uid_1_2_840_10008_5_1_4_1_1_601_1 = 370,
410 uid_1_2_840_10008_5_1_4_1_1_601_2 = 371,
411 uid_1_2_840_10008_5_1_4_1_2_4_2 = 372,
412 uid_1_2_840_10008_5_1_4_1_2_4_3 = 373,
413 uid_1_2_840_10008_5_1_4_1_2_5_3 = 374,
414 uid_1_2_840_10008_5_1_4_20_1 = 375,
415 uid_1_2_840_10008_5_1_4_20_2 = 376,
416 uid_1_2_840_10008_5_1_4_20_3 = 377,
417 uid_1_2_840_10008_5_1_4_34_5_1 = 378,
418 uid_1_2_840_10008_5_1_4_34_6 = 379,
419 uid_1_2_840_10008_5_1_4_34_6_1 = 380,
420 uid_1_2_840_10008_5_1_4_34_6_2 = 381,
421 uid_1_2_840_10008_5_1_4_34_6_3 = 382,
422 uid_1_2_840_10008_5_1_4_34_6_4 = 383,
423 uid_1_2_840_10008_5_1_4_34_7 = 384,
424 uid_1_2_840_10008_5_1_4_34_8 = 385,
425 uid_1_2_840_10008_5_1_4_34_9 = 386,
426 uid_1_2_840_10008_5_1_4_34_10 = 387,
427 uid_1_2_840_10008_5_1_4_38_4 = 388,
428 uid_1_2_840_10008_5_1_4_39_1 = 389,
429 uid_1_2_840_10008_5_1_4_39_2 = 390,
430 uid_1_2_840_10008_5_1_4_39_3 = 391,
431 uid_1_2_840_10008_5_1_4_39_4 = 392,
432 uid_1_2_840_10008_5_1_4_43_1 = 393,
433 uid_1_2_840_10008_5_1_4_43_2 = 394,
434 uid_1_2_840_10008_5_1_4_43_3 = 395,
435 uid_1_2_840_10008_5_1_4_43_4 = 396,
436 uid_1_2_840_10008_5_1_4_44_1 = 397,
437 uid_1_2_840_10008_5_1_4_44_2 = 398,
438 uid_1_2_840_10008_5_1_4_44_3 = 399,
439 uid_1_2_840_10008_5_1_4_44_4 = 400,
440 uid_1_2_840_10008_5_1_4_45_1 = 401,
441 uid_1_2_840_10008_5_1_4_45_2 = 402,
442 uid_1_2_840_10008_5_1_4_45_3 = 403,
443 uid_1_2_840_10008_5_1_4_45_4 = 404,
444 uid_1_2_840_10008_7_1_1 = 405,
445 uid_1_2_840_10008_7_1_2 = 406,
446 uid_1_2_840_10008_8_1_1 = 407,
447 uid_1_2_840_10008_5_1_4_1_1_4_3 = 408,
448 uid_1_2_840_10008_15_1_1 = 409
449 //
450 //
451 //
452 //
453 //
454 //
455 // Optionally private UIDs
456 //
457 #if 0
458 uid_1_2_840_113619_4_2,
459 uid_1_2_840_113619_4_3,
460 uid_1_3_12_2_1107_5_9_1,
461 uid_1_2_840_113619_4_26,
462 uid_1_2_840_113619_4_30,
463 uid_2_16_840_1_113709_1_5_1,
464 uid_2_16_840_1_113709_1_2_2,
465 uid_1_2_840_113543_6_6_1_3_10002,
466 uid_1_2_392_200036_9116_7_8_1_1_1,
467 uid_1_2_392_200036_9125_1_1_2,

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468 uid_1_2_840_113619_4_27,
469 uid_1_3_46_670589_11_0_0_12_1,
470 uid_1_3_46_670589_11_0_0_12_2,
471 uid_1_3_46_670589_11_0_0_12_4,
472 uid_1_3_46_670589_2_3_1_1,
473 uid_1_3_46_670589_2_4_1_1,
474 uid_1_3_46_670589_2_5_1_1,
475 uid_1_3_46_670589_5_0_1,
476 uid_1_3_46_670589_5_0_1_1,
477 uid_1_3_46_670589_5_0_10,
478 uid_1_3_46_670589_5_0_11,
479 uid_1_3_46_670589_5_0_11_1,
480 uid_1_3_46_670589_5_0_12,
481 uid_1_3_46_670589_5_0_13,
482 uid_1_3_46_670589_5_0_14,
483 uid_1_3_46_670589_5_0_2,
484 uid_1_3_46_670589_5_0_2_1,
485 uid_1_3_46_670589_5_0_3,
486 uid_1_3_46_670589_5_0_3_1,
487 uid_1_3_46_670589_5_0_4,
488 uid_1_3_46_670589_5_0_7,
489 uid_1_3_46_670589_5_0_8,
490 uid_1_3_46_670589_5_0_9,
491 uid_1_2_752_24_3_7_6,
492 uid_1_2_752_24_3_7_7,
493 uid_1_2_840_113619_5_2,
494 uid_1_3_46_670589_33_1_4_1
495 #endif
496 //
497 //
498
499 } TSType;
500
501 typedef enum {
502 VerificationSOPClass = 1, // Verification SOP Class
503 ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM = 2, // Implicit VR Little Endian: Default Transfer
    Syntax for DICOM
504 ExplicitVRLittleEndian = 3, // Explicit VR Little Endian
505 DeflatedExplicitVRLittleEndian = 4, // Deflated Explicit VR Little Endian
506 ExplicitVRBigEndian = 5, // Explicit VR Big Endian
507 JPEGBaselineProcess1DefaultTransferSyntaxforLossyJPEG8BitImageCompression = 6, // JPEG Baseline (Process 1):
    Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression
508 JPEGExtendedProcess24DefaultTransferSyntaxforLossyJPEG12BitImageCompressionProcess4only = 7, // JPEG
    Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4
    only)
509 JPEGExtendedProcess35Retired = 8, // JPEG Extended (Process 3 & 5)
510 JPEGSpectralSelectionNonHierarchicalProcess68Retired = 9, // JPEG Spectral Selection, Non-Hierarchical
    (Process 6 & 8)
511 JPEGSpectralSelectionNonHierarchicalProcess79Retired = 10, // JPEG Spectral Selection, Non-Hierarchical
    (Process 7 & 9)
512 JPEGFullProgressionNonHierarchicalProcess1012Retired = 11, // JPEG Full Progression, Non-Hierarchical
    (Process 10 & 12)
513 JPEGFullProgressionNonHierarchicalProcess1113Retired = 12, // JPEG Full Progression, Non-Hierarchical
    (Process 11 & 13)
514 JPEGLosslessNonHierarchicalProcess14 = 13, // JPEG Lossless, Non-Hierarchical (Process 14)
515 JPEGLosslessNonHierarchicalProcess15Retired = 14, // JPEG Lossless, Non-Hierarchical (Process 15)
516 JPEGExtendedHierarchicalProcess1618Retired = 15, // JPEG Extended, Hierarchical (Process 16 & 18)
517 JPEGExtendedHierarchicalProcess1719Retired = 16, // JPEG Extended, Hierarchical (Process 17 & 19)
518 JPEGSpectralSelectionHierarchicalProcess2022Retired = 17, // JPEG Spectral Selection, Hierarchical (Process
    20 & 22)
519 JPEGSpectralSelectionHierarchicalProcess2123Retired = 18, // JPEG Spectral Selection, Hierarchical (Process
    21 & 23)
520 JPEGFullProgressionHierarchicalProcess2426Retired = 19, // JPEG Full Progression, Hierarchical (Process 24 &
    26)
521 JPEGFullProgressionHierarchicalProcess2527Retired = 20, // JPEG Full Progression, Hierarchical (Process 25 &
    27)
522 JPEGLosslessHierarchicalProcess28Retired = 21, // JPEG Lossless, Hierarchical (Process 28)
523 JPEGLosslessHierarchicalProcess29Retired = 22, // JPEG Lossless, Hierarchical (Process 29)
524
    JPEGLosslessNonHierarchicalFirstOrderPredictionProcess14SelectionValue1DefaultTransferSyntaxforLosslessJPEGImageCompression
    = 23, // JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]):
    Default Transfer Syntax for Lossless JPEG Image Compression
525 JPEGLSLosslessImageCompression = 24, // JPEG-LS Lossless Image Compression
526 JPEGLSLossyNearLosslessImageCompression = 25, // JPEG-LS Lossy (Near-Lossless) Image Compression
527 JPEG2000ImageCompressionLosslessOnly = 26, // JPEG 2000 Image Compression (Lossless Only)
528 JPEG2000ImageCompression = 27, // JPEG 2000 Image Compression
529 JPEG2000Part2MulticomponentImageCompressionLosslessOnly = 28, // JPEG 2000 Part 2 Multi-component Image
    Compression (Lossless Only)
530 JPEG2000Part2MulticomponentImageCompression = 29, // JPEG 2000 Part 2 Multi-component Image Compression
531 JPIPReferenced = 30, // JPIP Referenced
532 JPIPReferencedDeflate = 31, // JPIP Referenced Deflate
533 MPEG2MainProfileMainLevel = 32, // MPEG2 Main Profile @ Main Level

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534 RLELossless = 33, // RLE Lossless
535 RFC2557MIMEencapsulation = 34, // RFC 2557 MIME encapsulation
536 XMLEncoding = 35, // XML Encoding
537 MediaStorageDirectoryStorage = 36, // Media Storage Directory Storage
538 TalairachBrainAtlasFrameofReference = 37, // Talairach Brain Atlas Frame of Reference
539 SPM2T1FrameofReference = 38, // SPM2 T1 Frame of Reference
540 SPM2T2FrameofReference = 39, // SPM2 T2 Frame of Reference
541 SPM2PDFFrameofReference = 40, // SPM2 PD Frame of Reference
542 SPM2EPIFrameofReference = 41, // SPM2 EPI Frame of Reference
543 SPM2FILTI1FrameofReference = 42, // SPM2 FIL T1 Frame of Reference
544 SPM2PETFrameofReference = 43, // SPM2 PET Frame of Reference
545 SPM2TRANSMFrameofReference = 44, // SPM2 TRANSM Frame of Reference
546 SPM2SPECTFrameofReference = 45, // SPM2 SPECT Frame of Reference
547 SPM2GRAYFrameofReference = 46, // SPM2 GRAY Frame of Reference
548 SPM2WHITEFrameofReference = 47, // SPM2 WHITE Frame of Reference
549 SPM2CSFFFrameofReference = 48, // SPM2 CSF Frame of Reference
550 SPM2BRAINMASKFrameofReference = 49, // SPM2 BRAINMASK Frame of Reference
551 SPM2AVG305T1FrameofReference = 50, // SPM2 AVG305T1 Frame of Reference
552 SPM2AVG152T1FrameofReference = 51, // SPM2 AVG152T1 Frame of Reference
553 SPM2AVG152T2FrameofReference = 52, // SPM2 AVG152T2 Frame of Reference
554 SPM2AVG152PDFFrameofReference = 53, // SPM2 AVG152PD Frame of Reference
555 SPM2SINGLESUBJT1FrameofReference = 54, // SPM2 SINGLESUBJT1 Frame of Reference
556 ICBM452T1FrameofReference = 55, // ICBM 452 T1 Frame of Reference
557 ICBMSingleSubjectMRIFrameofReference = 56, // ICBM Single Subject MRI Frame of Reference
558 BasicStudyContentNotificationSOPClassRetired = 57, // Basic Study Content Notification SOP Class
559 StorageCommitmentPushModelSOPClass = 58, // Storage Commitment Push Model SOP Class
560 StorageCommitmentPushModelSOPInstance = 59, // Storage Commitment Push Model SOP Instance
561 StorageCommitmentPullModelSOPClassRetired = 60, // Storage Commitment Pull Model SOP Class
562 StorageCommitmentPullModelSOPInstanceRetired = 61, // Storage Commitment Pull Model SOP Instance
563 ProceduralEventLoggingSOPClass = 62, // Procedural Event Logging SOP Class
564 ProceduralEventLoggingSOPInstance = 63, // Procedural Event Logging SOP Instance
565 SubstanceAdministrationLoggingSOPClass = 64, // Substance Administration Logging SOP Class
566 SubstanceAdministrationLoggingSOPInstance = 65, // Substance Administration Logging SOP Instance
567 DICOMUIDRegistry = 66, // DICOM UID Registry
568 DICOMControlledTerminology = 67, // DICOM Controlled Terminology
569 DICOMApplicationContextName = 68, // DICOM Application Context Name
570 DetachedPatientManagementSOPClassRetired = 69, // Detached Patient Management SOP Class
571 DetachedPatientManagementMetaSOPClassRetired = 70, // Detached Patient Management Meta SOP Class
572 DetachedVisitManagementSOPClassRetired = 71, // Detached Visit Management SOP Class
573 DetachedStudyManagementSOPClassRetired = 72, // Detached Study Management SOP Class
574 StudyComponentManagementSOPClassRetired = 73, // Study Component Management SOP Class
575 ModalityPerformedProcedureStepSOPClass = 74, // Modality Performed Procedure Step SOP Class
576 ModalityPerformedProcedureStepRetrieveSOPClass = 75, // Modality Performed Procedure Step Retrieve SOP Class
577 ModalityPerformedProcedureStepNotificationSOPClass = 76, // Modality Performed Procedure Step Notification
    SOP Class
578 DetachedResultsManagementSOPClassRetired = 77, // Detached Results Management SOP Class
579 DetachedResultsManagementMetaSOPClassRetired = 78, // Detached Results Management Meta SOP Class
580 DetachedStudyManagementMetaSOPClassRetired = 79, // Detached Study Management Meta SOP Class
581 DetachedInterpretationManagementSOPClassRetired = 80, // Detached Interpretation Management SOP Class
582 StorageServiceClass = 81, // Storage Service Class
583 BasicFilmSessionSOPClass = 82, // Basic Film Session SOP Class
584 BasicFilmBoxSOPClass = 83, // Basic Film Box SOP Class
585 BasicGrayscaleImageBoxSOPClass = 84, // Basic Grayscale Image Box SOP Class
586 BasicColorImageBoxSOPClass = 85, // Basic Color Image Box SOP Class
587 ReferencedImageBoxSOPClassRetired = 86, // Referenced Image Box SOP Class
588 BasicGrayscalePrintManagementMetaSOPClass = 87, // Basic Grayscale Print Management Meta SOP Class
589 ReferencedGrayscalePrintManagementMetaSOPClassRetired = 88, // Referenced Grayscale Print Management Meta
    SOP Class
590 PrintJobSOPClass = 89, // Print Job SOP Class
591 BasicAnnotationBoxSOPClass = 90, // Basic Annotation Box SOP Class
592 PrinterSOPClass = 91, // Printer SOP Class
593 PrinterConfigurationRetrievalSOPClass = 92, // Printer Configuration Retrieval SOP Class
594 PrinterSOPInstance = 93, // Printer SOP Instance
595 PrinterConfigurationRetrievalSOPInstance = 94, // Printer Configuration Retrieval SOP Instance
596 BasicColorPrintManagementMetaSOPClass = 95, // Basic Color Print Management Meta SOP Class
597 ReferencedColorPrintManagementMetaSOPClassRetired = 96, // Referenced Color Print Management Meta SOP Class
598 VOILUTBoxSOPClass = 97, // VOI LUT Box SOP Class
599 PresentationLUTSOPClass = 98, // Presentation LUT SOP Class
600 ImageOverlayBoxSOPClassRetired = 99, // Image Overlay Box SOP Class
601 BasicPrintImageOverlayBoxSOPClassRetired = 100, // Basic Print Image Overlay Box SOP Class
602 PrintQueueSOPInstanceRetired = 101, // Print Queue SOP Instance
603 PrintQueueManagementSOPClassRetired = 102, // Print Queue Management SOP Class
604 StoredPrintStorageSOPClassRetired = 103, // Stored Print Storage SOP Class
605 HardcopyGrayscaleImageStorageSOPClassRetired = 104, // Hardcopy Grayscale Image Storage SOP Class
606 HardcopyColorImageStorageSOPClassRetired = 105, // Hardcopy Color Image Storage SOP Class
607 PullPrintRequestSOPClassRetired = 106, // Pull Print Request SOP Class
608 PullStoredPrintManagementMetaSOPClassRetired = 107, // Pull Stored Print Management Meta SOP Class
609 MediaCreationManagementSOPClassUID = 108, // Media Creation Management SOP Class UID
610 ComputedRadiographyImageStorage = 109, // Computed Radiography Image Storage
611 DigitalXRayImageStorageForPresentation = 110, // Digital X-Ray Image Storage - For Presentation
612 DigitalXRayImageStorageForProcessing = 111, // Digital X-Ray Image Storage - For Processing
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613 DigitalMammographyXRayImageStorageForPresentation = 112, // Digital Mammography X-Ray Image Storage - For
    Presentation
614 DigitalMammographyXRayImageStorageForProcessing = 113, // Digital Mammography X-Ray Image Storage - For
    Processing
615 DigitalIntraoralXRayImageStorageForPresentation = 114, // Digital Intra-oral X-Ray Image Storage - For
    Presentation
616 DigitalIntraoralXRayImageStorageForProcessing = 115, // Digital Intra-oral X-Ray Image Storage - For
    Processing
617 CTImageStorage = 116, // CT Image Storage
618 EnhancedCTImageStorage = 117, // Enhanced CT Image Storage
619 UltrasoundMultiframeImageStorageRetired = 118, // Ultrasound Multi-frame Image Storage
620 UltrasoundMultiframeImageStorage = 119, // Ultrasound Multi-frame Image Storage
621 MRImageStorage = 120, // MR Image Storage
622 EnhancedMRImageStorage = 121, // Enhanced MR Image Storage
623 MRSpectroscopyStorage = 122, // MR Spectroscopy Storage
624 NuclearMedicineImageStorageRetired = 123, // Nuclear Medicine Image Storage
625 UltrasoundImageStorageRetired = 124, // Ultrasound Image Storage
626 UltrasoundImageStorage = 125, // Ultrasound Image Storage
627 SecondaryCaptureImageStorage = 126, // Secondary Capture Image Storage
628 MultiframeSingleBitSecondaryCaptureImageStorage = 127, // Multi-frame Single Bit Secondary Capture Image
    Storage
629 MultiframeGrayscaleByteSecondaryCaptureImageStorage = 128, // Multi-frame Grayscale Byte Secondary Capture
    Image Storage
630 MultiframeGrayscaleWordSecondaryCaptureImageStorage = 129, // Multi-frame Grayscale Word Secondary Capture
    Image Storage
631 MultiframeTrueColorSecondaryCaptureImageStorage = 130, // Multi-frame True Color Secondary Capture Image
    Storage
632 StandaloneOverlayStorageRetired = 131, // Standalone Overlay Storage
633 StandaloneCurveStorageRetired = 132, // Standalone Curve Storage
634 WaveformStorageTrialRetired = 133, // Waveform Storage - Trial
635 ECG12leadWaveformStorage = 134, // 12-lead ECG Waveform Storage
636 GeneralECGWaveformStorage = 135, // General ECG Waveform Storage
637 AmbulatoryECGWaveformStorage = 136, // Ambulatory ECG Waveform Storage
638 HemodynamicWaveformStorage = 137, // Hemodynamic Waveform Storage
639 CardiacElectrophysiologyWaveformStorage = 138, // Cardiac Electrophysiology Waveform Storage
640 BasicVoiceAudioWaveformStorage = 139, // Basic Voice Audio Waveform Storage
641 StandaloneModalityLUTStorageRetired = 140, // Standalone Modality LUT Storage
642 StandaloneVOILUTStorageRetired = 141, // Standalone VOI LUT Storage
643 GrayscaleSoftcopyPresentationStateStorageSOPClass = 142, // Grayscale Softcopy Presentation State Storage
    SOP Class
644 ColorSoftcopyPresentationStateStorageSOPClass = 143, // Color Softcopy Presentation State Storage SOP Class
645 PseudoColorSoftcopyPresentationStateStorageSOPClass = 144, // Pseudo-Color Softcopy Presentation State
    Storage SOP Class
646 BlendingSoftcopyPresentationStateStorageSOPClass = 145, // Blending Softcopy Presentation State Storage SOP
    Class
647 XRayAngiographicImageStorage = 146, // X-Ray Angiographic Image Storage
648 EnhancedXAImageStorage = 147, // Enhanced XA Image Storage
649 XRayRadiofluoroscopicImageStorage = 148, // X-Ray Radiofluoroscopic Image Storage
650 EnhancedXRFImageStorage = 149, // Enhanced XRF Image Storage
651 XRay3DAngiographicImageStorage = 150, // X-Ray 3D Angiographic Image Storage
652 XRay3DCraniofacialImageStorage = 151, // X-Ray 3D Craniofacial Image Storage
653 XRayAngiographicBiPlaneImageStorageRetired = 152, // X-Ray Angiographic Bi-Plane Image Storage
654 NuclearMedicineImageStorage = 153, // Nuclear Medicine Image Storage
655 RawDataStorage = 154, // Raw Data Storage
656 SpatialRegistrationStorage = 155, // Spatial Registration Storage
657 SpatialFiducialsStorage = 156, // Spatial Fiducials Storage
658 DeformableSpatialRegistrationStorage = 157, // Deformable Spatial Registration Storage
659 SegmentationStorage = 158, // Segmentation Storage
660 RealWorldValueMappingStorage = 159, // Real World Value Mapping Storage
661 VLImageStorageTrialRetired = 160, // VL Image Storage - Trial
662 VLMultiframeImageStorageTrialRetired = 161, // VL Multi-frame Image Storage - Trial
663 VLEndoscopicImageStorage = 162, // VL Endoscopic Image Storage
664 VideoEndoscopicImageStorage = 163, // Video Endoscopic Image Storage
665 VLMicroscopicImageStorage = 164, // VL Microscopic Image Storage
666 VideoMicroscopicImageStorage = 165, // Video Microscopic Image Storage
667 VLSlideCoordinatesMicroscopicImageStorage = 166, // VL Slide-Coordinates Microscopic Image Storage
668 VLPhotographicImageStorage = 167, // VL Photographic Image Storage
669 VideoPhotographicImageStorage = 168, // Video Photographic Image Storage
670 OphthalmicPhotography8BitImageStorage = 169, // Ophthalmic Photography 8 Bit Image Storage
671 OphthalmicPhotography16BitImageStorage = 170, // Ophthalmic Photography 16 Bit Image Storage
672 StereometricRelationshipStorage = 171, // Stereometric Relationship Storage
673 OphthalmicTomographyImageStorage = 172, // Ophthalmic Tomography Image Storage
674 TextSRStorageTrialRetired = 173, // Text SR Storage - Trial
675 AudioSRStorageTrialRetired = 174, // Audio SR Storage - Trial
676 DetailSRStorageTrialRetired = 175, // Detail SR Storage - Trial
677 ComprehensiveSRStorageTrialRetired = 176, // Comprehensive SR Storage - Trial
678 BasicTextSRStorage = 177, // Basic Text SR Storage
679 EnhancedSRStorage = 178, // Enhanced SR Storage
680 ComprehensiveSRStorage = 179, // Comprehensive SR Storage
681 ProcedureLogStorage = 180, // Procedure Log Storage
682 MammographyCADSRStorage = 181, // Mammography CAD SR Storage
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683 KeyObjectSelectionDocumentStorage = 182, // Key Object Selection Document Storage
684 ChestCADSRStorage = 183, // Chest CAD SR Storage
685 XRayRadiationDoseSRStorage = 184, // X-Ray Radiation Dose SR Storage
686 EncapsulatedPDFStorage = 185, // Encapsulated PDF Storage
687 EncapsulatedCDAStorage = 186, // Encapsulated CDA Storage
688 PositronEmissionTomographyImageStorage = 187, // Positron Emission Tomography Image Storage
689 StandalonePETCurveStorageRetired = 188, // Standalone PET Curve Storage
690 RTImageStorage = 189, // RT Image Storage
691 RTDoseStorage = 190, // RT Dose Storage
692 RTStructureSetStorage = 191, // RT Structure Set Storage
693 RTBeamsTreatmentRecordStorage = 192, // RT Beams Treatment Record Storage
694 RTPlanStorage = 193, // RT Plan Storage
695 RTBrachyTreatmentRecordStorage = 194, // RT Brachy Treatment Record Storage
696 RTTreatmentSummaryRecordStorage = 195, // RT Treatment Summary Record Storage
697 RTIonPlanStorage = 196, // RT Ion Plan Storage
698 RTIonBeamsTreatmentRecordStorage = 197, // RT Ion Beams Treatment Record Storage
699 PatientRootQueryRetrieveInformationModelFIND = 198, // Patient Root Query/Retrieve Information Model - FIND
700 PatientRootQueryRetrieveInformationModelMOVE = 199, // Patient Root Query/Retrieve Information Model - MOVE
701 PatientRootQueryRetrieveInformationModelGET = 200, // Patient Root Query/Retrieve Information Model - GET
702 StudyRootQueryRetrieveInformationModelFIND = 201, // Study Root Query/Retrieve Information Model - FIND
703 StudyRootQueryRetrieveInformationModelMOVE = 202, // Study Root Query/Retrieve Information Model - MOVE
704 StudyRootQueryRetrieveInformationModelGET = 203, // Study Root Query/Retrieve Information Model - GET
705 PatientStudyOnlyQueryRetrieveInformationModelFINDRetired = 204, // Patient/Study Only Query/Retrieve
    Information Model - FIND
706 PatientStudyOnlyQueryRetrieveInformationModelMOVERetired = 205, // Patient/Study Only Query/Retrieve
    Information Model - MOVE
707 PatientStudyOnlyQueryRetrieveInformationModelGETRetired = 206, // Patient/Study Only Query/Retrieve
    Information Model - GET
708 ModalityWorklistInformationModelFIND = 207, // Modality Worklist Information Model - FIND
709 GeneralPurposeWorklistInformationModelFIND = 208, // General Purpose Worklist Information Model - FIND
710 GeneralPurposeScheduledProcedureStepSOPClass = 209, // General Purpose Scheduled Procedure Step SOP Class
711 GeneralPurposePerformedProcedureStepSOPClass = 210, // General Purpose Performed Procedure Step SOP Class
712 GeneralPurposeWorklistManagementMetaSOPClass = 211, // General Purpose Worklist Management Meta SOP Class
713 InstanceAvailabilityNotificationSOPClass = 212, // Instance Availability Notification SOP Class
714 RTBeamsDeliveryInstructionStorageSupplement74FrozenDraft = 213, // RT Beams Delivery Instruction Storage
    (Supplement 74 Frozen Draft)
715 RTConventionalMachineVerificationSupplement74FrozenDraft = 214, // RT Conventional Machine Verification
    (Supplement 74 Frozen Draft)
716 RTIonMachineVerificationSupplement74FrozenDraft = 215, // RT Ion Machine Verification (Supplement 74 Frozen
    Draft)
717 UnifiedWorklistandProcedureStepServiceClass = 216, // Unified Worklist and Procedure Step Service Class
718 UnifiedProcedureStepPushSOPClass = 217, // Unified Procedure Step - Push SOP Class
719 UnifiedProcedureStepWatchSOPClass = 218, // Unified Procedure Step - Watch SOP Class
720 UnifiedProcedureStepPullSOPClass = 219, // Unified Procedure Step - Pull SOP Class
721 UnifiedProcedureStepEventSOPClass = 220, // Unified Procedure Step - Event SOP Class
722 UnifiedWorklistandProcedureStepSOPInstance = 221, // Unified Worklist and Procedure Step SOP Instance
723 GeneralRelevantPatientInformationQuery = 222, // General Relevant Patient Information Query
724 BreastImagingRelevantPatientInformationQuery = 223, // Breast Imaging Relevant Patient Information Query
725 CardiacRelevantPatientInformationQuery = 224, // Cardiac Relevant Patient Information Query
726 HangingProtocolStorage = 225, // Hanging Protocol Storage
727 HangingProtocolInformationModelFIND = 226, // Hanging Protocol Information Model - FIND
728 HangingProtocolInformationModelMOVE = 227, // Hanging Protocol Information Model - MOVE
729 ProductCharacteristicsQuerySOPClass = 228, // Product Characteristics Query SOP Class
730 SubstanceApprovalQuerySOPClass = 229, // Substance Approval Query SOP Class
731 dicomDeviceName = 230, // dicomDeviceName
732 dicomDescription = 231, // dicomDescription
733 dicomManufacturer = 232, // dicomManufacturer
734 dicomManufacturerModelName = 233, // dicomManufacturerModelName
735 dicomSoftwareVersion = 234, // dicomSoftwareVersion
736 dicomVendorData = 235, // dicomVendorData
737 dicomAETitle = 236, // dicomAETitle
738 dicomNetworkConnectionReference = 237, // dicomNetworkConnectionReference
739 dicomApplicationCluster = 238, // dicomApplicationCluster
740 dicomAssociationInitiator = 239, // dicomAssociationInitiator
741 dicomAssociationAcceptor = 240, // dicomAssociationAcceptor
742 dicomHostname = 241, // dicomHostname
743 dicomPort = 242, // dicomPort
744 dicomSOPClass = 243, // dicomSOPClass
745 dicomTransferRole = 244, // dicomTransferRole
746 dicomTransferSyntax = 245, // dicomTransferSyntax
747 dicomPrimaryDeviceType = 246, // dicomPrimaryDeviceType
748 dicomRelatedDeviceReference = 247, // dicomRelatedDeviceReference
749 dicomPreferredCalledAETitle = 248, // dicomPreferredCalledAETitle
750 dicomTLSCyphersuite = 249, // dicomTLSCyphersuite
751 dicomAuthorizedNodeCertificateReference = 250, // dicomAuthorizedNodeCertificateReference
752 dicomThisNodeCertificateReference = 251, // dicomThisNodeCertificateReference
753 dicomInstalled = 252, // dicomInstalled
754 dicomStationName = 253, // dicomStationName
755 dicomDeviceSerialNumber = 254, // dicomDeviceSerialNumber
756 dicomInstitutionName = 255, // dicomInstitutionName
757 dicomInstitutionAddress = 256, // dicomInstitutionAddress
```

```

758 dicomInstitutionDepartmentName = 257, // dicomInstitutionDepartmentName
759 dicomIssuerOfPatientID = 258, // dicomIssuerOfPatientID
760 dicomPreferredCallingAETitle = 259, // dicomPreferredCallingAETitle
761 dicomSupportedCharacterSet = 260, // dicomSupportedCharacterSet
762 dicomConfigurationRoot = 261, // dicomConfigurationRoot
763 dicomDevicesRoot = 262, // dicomDevicesRoot
764 dicomUniqueAETitlesRegistryRoot = 263, // dicomUniqueAETitlesRegistryRoot
765 dicomDevice = 264, // dicomDevice
766 dicomNetworkAE = 265, // dicomNetworkAE
767 dicomNetworkConnection = 266, // dicomNetworkConnection
768 dicomUniqueAETitle = 267, // dicomUniqueAETitle
769 dicomTransferCapability = 268, // dicomTransferCapability
770 //
771 VLWholeSlideMicroscopyImageStorage = 269,
772 EnhancedUSVolumeStorage = 270,
773 SurfaceSegmentationStorage = 271,
774 BreastTomosynthesisImageStorage = 272,
775 LegacyConvertedEnhancedCTImageStorage = 273,
776 LegacyConvertedEnhancedMRIImageStorage = 274,
777 LegacyConvertedEnhancedPETImageStorage = 275,
778 MPEG2MainProfileHighLevel = 276,
779 MPEG4AVCH_264HighProfileLevel4_1 = 277,
780 MPEG4AVCH_264BDcompatibleHighProfileLevel4_1 = 278,
781
782 //
783 // 2019b
784 //
785 //
786 PETColorPaletteSOPInstance = 279,
787 HotMetalBlueColorPaletteSOPInstance = 280,
788 PET20StepColorPaletteSOPInstance = 281,
789 SpringColorPaletteSOPInstance = 282,
790 SummerColorPaletteSOPInstance = 283,
791 FallColorPaletteSOPInstance = 284,
792 WinterColorPaletteSOPInstance = 285,
793 Papyrus3ImplicitVRLittleEndian = 286,
794 AdultMouseAnatomyOntology = 287,
795 UberonOntology = 288,
796 IntegratedTaxonomicInformationSystemITISTaxonomicSerialNumberTSN = 289,
797 MouseGenomeInitiativeMGI = 290,
798 PubChemCompoundCID = 291,
799 ICD11 = 292,
800 NewYorkUniversityMelanomaClinicalCooperativeGroup = 293,
801 MayoClinicNonradiologicalImagesSBSAnatomicalSurfaceRegionGuide = 294,
802 ImageBiomarkerStandardisationInitiative = 295,
803 RadiomicsOntology = 296,
804 DisplaySystemSOPClass = 297,
805 DisplaySystemSOPInstance = 298,
806 GeneralAudioWaveformStorage = 299,
807 ArterialPulseWaveformStorage = 300,
808 RespiratoryWaveformStorage = 301,
809 XAXRFGrayscaleSoftcopyPresentationStateStorage = 302,
810 GrayscalePlanarMPRVolumetricPresentationStateStorage = 303,
811 MPEG4AVCH_264HighProfileLevel4_2For2DVideo = 304,
812 MPEG4AVCH_264HighProfileLevel4_2For3DVideo = 305,
813 MPEG4AVCH_264StereoHighProfileLevel4_2 = 306,
814 HEVCH_265MainProfileLevel5_1 = 307,
815 HEVCH_265Main10ProfileLevel5_1 = 308,
816 HotIronColorPaletteSOPInstance = 309,
817 CompositingPlanarMPRVolumetricPresentationStateStorage = 310,
818 AdvancedBlendingPresentationStateStorage = 311,
819 VolumeRenderingVolumetricPresentationStateStorage = 312,
820 SegmentedVolumeRenderingVolumetricPresentationStateStorage = 313,
821 MultipleVolumeRenderingVolumetricPresentationStateStorage = 314,
822 Null0 = 315,
823 BreastProjectionXRayImageStorageForPresentation = 316,
824 BreastProjectionXRayImageStorageForProcessing = 317,
825 IntravascularOpticalCoherenceTomographyImageStorageForPresentation = 318,
826 IntravascularOpticalCoherenceTomographyImageStorageForProcessing = 319,
827 ParametricMapStorage = 320,
828 Null1 = 321,
829 TractographyResultsStorage = 322,
830 SurfaceScanMeshStorage = 323,
831 SurfaceScanPointCloudStorage = 324,
832 WideFieldOphthalmicPhotographyStereographicProjectionImageStorage = 325,
833 WideFieldOphthalmicPhotography3DCoordinatesImageStorage = 326,
834 OphthalmicOpticalCoherenceTomographyEnFaceImageStorage = 327,
835 OphthalmicOpticalCoherenceTomographyBscanVolumeAnalysisStorage = 328,
836 LensometryMeasurementsStorage = 329,
837 AutorefractionMeasurementsStorage = 330,
838 KeratometryMeasurementsStorage = 331,
839 SubjectiveRefractionMeasurementsStorage = 332,

```

```

840 VisualAcuityMeasurementsStorage           = 333,
841 SpectaclePrescriptionReportStorage         = 334,
842 OphthalmicAxialMeasurementsStorage        = 335,
843 IntraocularLensCalculationsStorage          = 336,
844 MacularGridThicknessandVolumeReportStorage = 337,
845 OphthalmicVisualFieldStaticPerimetryMeasurementsStorage = 338,
846 OphthalmicThicknessMapStorage              = 339,
847 CornealTopographyMapStorage                = 340,
848 Comprehensive3DSRStorage                   = 341,
849 ExtensibleSRStorage                        = 342,
850 RadiopharmaceuticalRadiationDoseSRStorage  = 343,
851 ColonCADSRStorage                         = 344,
852 ImplantationPlanSRStorage                  = 345,
853 AcquisitionContextSRStorage                = 346,
854 SimplifiedAdultEchoSRStorage               = 347,
855 PatientRadiationDoseSRStorage              = 348,
856 PlannedImagingAgentAdministrationSRStorage = 349,
857 PerformedImagingAgentAdministrationSRStorage = 350,
858 ContentAssessmentResultsStorage            = 351,
859 EncapsulatedSTLStorage                     = 352,
860 EnhancedPETImageStorage                    = 353,
861 BasicStructuredDisplayStorage               = 354,
862 CTDefinedProcedureProtocolStorage           = 355,
863 CTPerformedProcedureProtocolStorage         = 356,
864 ProtocolApprovalStorage                    = 357,
865 ProtocolApprovalInformationModelFIND        = 358,
866 ProtocolApprovalInformationModelMOVE       = 359,
867 ProtocolApprovalInformationModelGET        = 360,
868 RTPhysicianIntentStorage                   = 361,
869 RTSegmentAnnotationStorage                 = 362,
870 DICOSCTImageStorage                        = 363,
871 DICOSDigitalXRayImageStorageForPresentation = 364,
872 DICOSDigitalXRayImageStorageForProcessing  = 365,
873 DICOSThreatDetectionReportStorage          = 366,
874 DICOS2DAITStorage                         = 367,
875 DICOS3DAITStorage                         = 368,
876 DICOSQuadrupoleResonanceQRStorage         = 369,
877 EddyCurrentImageStorage                   = 370,
878 EddyCurrentMultiframeImageStorage          = 371,
879 CompositeInstanceRootRetrieveMOVE          = 372,
880 CompositeInstanceRootRetrieveGET           = 373,
881 CompositeInstanceRetrieveWithoutBulkDataGET = 374,
882 DefinedProcedureProtocolInformationModelFIND = 375,
883 DefinedProcedureProtocolInformationModelMOVE = 376,
884 DefinedProcedureProtocolInformationModelGET = 377,
885 UPSFilteredGlobalSubscriptionSOPInstance   = 378,
886 UnifiedWorklistandProcedureStepServiceClass1 = 379,
887 UnifiedProcedureStepPushSOPClass1         = 380,
888 UnifiedProcedureStepWatchSOPClass1        = 381,
889 UnifiedProcedureStepPullSOPClass1         = 382,
890 UnifiedProcedureStepEventSOPClass1        = 383,
891 RTBeamsDeliveryInstructionStorage           = 384,
892 RTConventionalMachineVerification          = 385,
893 RTIonMachineVerification                   = 386,
894 RTBrachyApplicationSetupDeliveryInstructionStorage = 387,
895 HangingProtocolInformationModelGET         = 388,
896 ColorPaletteStorage                        = 389,
897 ColorPaletteQueryRetrieveInformationModelFIND = 390,
898 ColorPaletteQueryRetrieveInformationModelMOVE = 391,
899 ColorPaletteQueryRetrieveInformationModelGET = 392,
900 GenericImplantTemplateStorage              = 393,
901 GenericImplantTemplateInformationModelFIND  = 394,
902 GenericImplantTemplateInformationModelMOVE  = 395,
903 GenericImplantTemplateInformationModelGET   = 396,
904 ImplantAssemblyTemplateStorage              = 397,
905 ImplantAssemblyTemplateInformationModelFIND = 398,
906 ImplantAssemblyTemplateInformationModelMOVE = 399,
907 ImplantAssemblyTemplateInformationModelGET  = 400,
908 ImplantTemplateGroupStorage                 = 401,
909 ImplantTemplateGroupInformationModelFIND    = 402,
910 ImplantTemplateGroupInformationModelMOVE    = 403,
911 ImplantTemplateGroupInformationModelGET     = 404,
912 NativeDICOMModel                           = 405,
913 AbstractMultiDimensionalImageModel         = 406,
914 DICOMContentMappingResource                 = 407,
915 EnhancedMRColorImageStorage                = 408,
916 UniversalCoordinatedTime                   = 409
917 //
918 //
920
922 //

```

```

923 // Optionally private UUIDs
924 //
925 #if 0
926 Private_1_2_840_113619_4_2,
927 Private_1_2_840_113619_4_3,
928 Private_1_3_12_2_1107_5_9_1,
929 Private_1_2_840_113619_4_26,
930 Private_1_2_840_113619_4_30,
931 Private_2_16_840_1_113709_1_5_1,
932 Private_2_16_840_1_113709_1_2_2,
933 Private_1_2_840_113543_6_6_1_3_10002,
934 Private_1_2_392_200036_9116_7_8_1_1_1,
935 Private_1_2_392_200036_9125_1_1_2,
936 Private_1_2_840_113619_4_27,
937 Private_1_3_46_670589_11_0_0_12_1,
938 Private_1_3_46_670589_11_0_0_12_2,
939 Private_1_3_46_670589_11_0_0_12_4,
940 Private_1_3_46_670589_2_3_1_1,
941 Private_1_3_46_670589_2_4_1_1,
942 Private_1_3_46_670589_2_5_1_1,
943 Private_1_3_46_670589_5_0_1,
944 Private_1_3_46_670589_5_0_1_1,
945 Private_1_3_46_670589_5_0_10,
946 Private_1_3_46_670589_5_0_11,
947 Private_1_3_46_670589_5_0_11_1,
948 Private_1_3_46_670589_5_0_12,
949 Private_1_3_46_670589_5_0_13,
950 Private_1_3_46_670589_5_0_14,
951 Private_1_3_46_670589_5_0_2,
952 Private_1_3_46_670589_5_0_2_1,
953 Private_1_3_46_670589_5_0_3,
954 Private_1_3_46_670589_5_0_3_1,
955 Private_1_3_46_670589_5_0_4,
956 Private_1_3_46_670589_5_0_7,
957 Private_1_3_46_670589_5_0_8,
958 Private_1_3_46_670589_5_0_9,
959 Private_1_2_752_24_3_7_6,
960 Private_1_2_752_24_3_7_7,
961 Private_1_2_840_113619_5_2,
962 Private_1_3_46_670589_33_1_4_1
963 #endif
964 //
965 //
966 } TSName;
967
968
969
970
971 typedef const char* const (*TransferSyntaxStringsType)[2];
972 static TransferSyntaxStringsType GetTransferSyntaxStrings();
973 static const char * const *GetTransferSyntaxString(unsigned int ts);
974 static unsigned int GetNumberOfTransferSyntaxStrings();
975
976
977 // TODO: Because I would like a dual signature for TSType and TSName, C++ won't let me do it...
978 static const char* GetUIDString(/*TSType*/ unsigned int ts);
979 static const char* GetUIDName(/*TSType*/ unsigned int ts);
980
981
982 bool SetFromUID(const char *str);
983
984
985 const char *GetName() const;
986
987
988 const char *GetString() const;
989
990 operator TSType ()const { return TSField; }
991
992 private:
993 TSType TSField;
994 };
995 //-----
996 inline std::ostream &operator<<(std::ostream &_os, const UUIDs &uid)
997 {
998     _os << uid.GetString() << " -> " << uid.GetName();
999     return _os;
1000 }
1001
1002 }
1003
1004 // end namespace gdcm
1005
1006 #endif //GDCMUIDS_H

```

## 11.109 gdcmAttribute.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmTagToType.h"
#include "gdcmVM.h"
#include "gdcmElement.h"
#include "gdcmDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmStaticAssert.h"
#include <string>
#include <vector>
#include <sstream>
```

Include dependency graph for gdcmAttribute.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Attribute< Group, Element, TVR, TVM >](#)  
*Attribute class This class use template metaprograming tricks to let the user know when the template instantiation does not match the public dictionary.*
- class [gdcm::Attribute< Group, Element, TVR, VM::VM1 >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_3 >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_8 >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM1\\_n >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM2\\_2n >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM2\\_n >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM3\\_3n >](#)
- class [gdcm::Attribute< Group, Element, TVR, VM::VM3\\_n >](#)
- class [gdcm::VRVLSize< 0 >](#)
- class [gdcm::VRVLSize< 1 >](#)

### Namespaces

- namespace [gdcm](#)

## 11.110 gdcmAttribute.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMATTRIBUTE_H
```

```

15 #define GDCMATATTRIBUTE_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmVR.h"
19 #include "gdcmTagToType.h"
20 #include "gdcmVM.h"
21 #include "gdcmElement.h"
22 #include "gdcmDataElement.h"
23 #include "gdcmDataSet.h"
24 #include "gdcmStaticAssert.h"
25
26 #include <string>
27 #include <vector>
28 #include <sstream>
29
30 namespace gdcm_ns
31 {
32
33 struct void_;
34
35 // Declaration, also serve as forward declaration
36 template<int T> class VRVLSize;
37
38 // Implementation when VL is coded on 16 bits:
39 template<> class VRVLSize<0> {
40 public:
41     static inline uint16_t Read(std::istream &_is) {
42         uint16_t l;
43         _is.read((char*)&l, 2);
44         return l;
45     }
46
47     static inline void Write(std::ostream &os) { (void)os;
48     }
49 };
50 // Implementation when VL is coded on 32 bits:
51 template<> class VRVLSize<1> {
52 public:
53     static inline uint32_t Read(std::istream &_is) {
54         char dummy[2];
55         _is.read(dummy, 2);
56
57         uint32_t l;
58         _is.read((char*)&l, 4);
59         return l;
60     }
61
62     static inline void Write(std::ostream &os) { (void)os;
63     }
64 };
65
66 template<uint16_t Group, uint16_t Element,
67     long long TVR = TagToType<Group, Element>::VRType, // can the user override this value ?
68     int TVM = TagToType<Group, Element>::VMType // can the user override this value ?
69     /*typename SQAttribute = void_*/ > // if only I had variadic template...
70 class Attribute
71 {
72 public:
73     typedef typename VRToType<TVR>::Type ArrayType;
74     enum { VMType = VMToLength<TVM>::Length };
75     ArrayType Internal[VMToLength<TVM>::Length];
76
77     // Make sure that user specified VR/VM are compatible with the public dictionary:
78     GDCM_STATIC_ASSERT( ((VR::VRType)TVR & (VR::VRType)(TagToType<Group, Element>::VRType)) );
79     GDCM_STATIC_ASSERT( ((VM::VMType)TVM & (VM::VMType)(TagToType<Group, Element>::VMType)) );
80     GDCM_STATIC_ASSERT( (((VR::VRType)TVR & VR::VR_VM1) && ((VM::VMType)TVM == VM::VM1) )
81         || !((VR::VRType)TVR & VR::VR_VM1) );
82
83     static Tag GetTag() { return Tag(Group,Element); }
84     static VR GetVR() { return (VR::VRType)TVR; }
85     static VM GetVM() { return (VM::VMType)TVM; }
86
87     // The following two methods do make sense only in case of public element,
88     // when the template is intanciated with private element the VR/VM are simply
89     // defaulted to allow everything (see gdcmTagToType.h default template for TagToType)
90     static VR GetDictVR() { return (VR::VRType)(TagToType<Group, Element>::VRType); }
91     static VM GetDictVM() { return (VM::VMType)(TagToType<Group, Element>::VMType); }
92
93     // Some extra dummy checks:
94     // Data Elements with a VR of SQ, OF, OW, OB or UN shall always have a Value Multiplicity of one.
95
96

```



```

111 unsigned int GetNumberOfValues()const {
112     return VMTLength<TVM>::Length;
113 }
114 // Implementation of Print is common to all Mode (ASCII/Binary)
115 // TODO: Can we print a \ when in ASCII...well I don't think so
116 // it would mean we used a bad VM then, right ?
117 void Print(std::ostream &os)const {
118     os << GetTag() << " ";
119     os << TagToType<Group,Element>::GetVRString() << " ";
120     os << TagToType<Group,Element>::GetVMString() << " ";
121     os << Internal[0]; // VM is at least guarantee to be one
122     for(unsigned int i=1; i<GetNumberOfValues(); ++i)
123         os << "," << Internal[i];
124 }
125
126 // copy:
127 //ArrayType GetValue(unsigned int idx = 0) {
128 //    assert( idx < GetNumberOfValues() );
129 //    return Internal[idx];
130 //}
131 //ArrayType operator[] (unsigned int idx) {
132 //    return GetValue(idx);
133 //}
134 // FIXME: is this always a good idea ?
135 // I do not think so, I prefer operator
136 //operator ArrayType () const { return Internal[0]; }
137
138 bool operator==(const Attribute &att)const
139 {
140     return std::equal(Internal, Internal+GetNumberOfValues(),
141         att.GetValues());
142 }
143 bool operator!=(const Attribute &att)const
144 {
145     return !std::equal(Internal, Internal+GetNumberOfValues(),
146         att.GetValues());
147 }
148 bool operator<(const Attribute &att)const
149 {
150     return std::lexicographical_compare(Internal, Internal+GetNumberOfValues(),
151         att.GetValues(), att.GetValues() + att.GetNumberOfValues() );
152 }
153
154 ArrayType &GetValue(unsigned int idx = 0) {
155     assert( idx < GetNumberOfValues() );
156     return Internal[idx];
157 }
158 ArrayType & operator[] (unsigned int idx) {
159     return GetValue(idx);
160 }
161 // const reference
162 ArrayType const &GetValue(unsigned int idx = 0)const {
163     assert( idx < GetNumberOfValues() );
164     return Internal[idx];
165 }
166 ArrayType const & operator[] (unsigned int idx)const {
167     return GetValue(idx);
168 }
169 void SetValue(ArrayType v, unsigned int idx = 0) {
170     assert( idx < GetNumberOfValues() );
171     Internal[idx] = v;
172 }
173 void SetValues(const ArrayType* array, unsigned int numel = VMType ) {
174     assert( array && numel && numel == GetNumberOfValues() );
175     // std::copy is smarter than a memcpy, and will call memcpy when POD type
176     std::copy(array, array+numel, Internal);
177 }
178 const ArrayType* GetValues()const {
179     return Internal;
180 }
181
182 // API to talk to the run-time layer: gdcmm::DataElement
183 DataElement GetAsDataElement()const {
184     DataElement ret( GetTag() );
185     std::ostringstream os;
186     // os.imbue(std::locale::classic()); // This is not required AFAIK
187     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
188         GetNumberOfValues(),os);
189     ret.SetVR( GetVR() );
190     assert( ret.GetVR() != VR::SQ );
191     if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )

```



```

192     {
193         if( GetVR() != VR::UI )
194         {
195             if( os.str().size() % 2 )
196             {
197                 os << " ";
198             }
199         }
200     }
201     VL::Type osStrSize = (VL::Type)os.str().size();
202     ret.SetByteValue( os.str().c_str(), osStrSize );
203     return ret;
204 }
205
206 void SetFromDataElement(DataElement const &de) {
207     // This is kind of hackish but since I do not generate other element than the first one: 0x6000 I
208     // should be ok:
209     assert( Tag(Group,Element) == de.GetTag() || Group == 0x6000 || Group == 0x5000 );
210     assert( GetVR() != VR::INVALID );
211     assert( GetVR().Compatible( de.GetVR() ) || de.GetVR() == VR::INVALID ); // In case of VR::INVALID
212     // cannot use the & operator
213     if( de.IsEmpty() ) return;
214     const ByteValue *bv = de.GetByteValue();
215     #ifdef GDCM_WORDS_BIGENDIAN
216     if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
217     #else
218     if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
219     #endif
220     {
221         SetByteValue(bv);
222     }
223     else
224     {
225         SetByteValueNoSwap(bv);
226     }
227 }
228
229 void Set(DataSet const &ds) {
230     SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
231 }
232
233 void SetFromDataSet(DataSet const &ds) {
234     if( ds.FindDataElement( Tag(Group,Element) ) &&
235         !ds.GetDataElement( Tag(Group,Element) ).IsEmpty() )
236     {
237         SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
238     }
239 }
240
241 protected:
242 void SetByteValueNoSwap(const ByteValue *bv) {
243     if( !bv ) return; // That would be bad...
244     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
245     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
246     // {
247     //     // always do a copy !
248     //     SetValues(bv->GetPointer(), bv->GetLength());
249     // }
250     //else
251     {
252         std::stringstream ss;
253         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
254         ss.str( s );
255         EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(Internal,
256             GetNumberOfValues(),ss);
257     }
258 }
259
260 void SetByteValue(const ByteValue *bv) {
261     if( !bv ) return; // That would be bad...
262     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
263     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
264     // {
265     //     // always do a copy !
266     //     SetValues(bv->GetPointer(), bv->GetLength());
267     // }
268     //else
269     {
270         std::stringstream ss;
271         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
272         ss.str( s );
273         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
274             GetNumberOfValues(),ss);
275     }
276 }

```

```

271 #if 0 // TODO FIXME the implicit way:
272 // explicit:
273 void Read(std::istream &_is) {
274     const uint16_t cref[] = { Group, Element };
275     uint16_t c[2];
276     _is.read((char*)&c, sizeof(c));
277     assert( c[0] == cref[0] && c[1] == cref[1] );
278     char vr[2];
279     _is.read(vr, 2); // Check consistency ?
280     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
281     uint32_t l = VRVLSize< (TVR & VR::VL32) >::Read(_is);
282     l /= sizeof( typename VRToType<TVR>::Type );
283     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
284         l, _is);
285 }
286 void Write(std::ostream &_os) const {
287     uint16_t c[] = { Group, Element };
288     _os.write((char*)&c, 4);
289     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
290     _os.write((char*)&l, 4);
291     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
292         GetLength(), _os);
293 }
294 void Read(std::istream &_is) {
295     uint16_t cref[] = { Group, Element };
296     uint16_t c[2];
297     _is.read((char*)&c, 4);
298     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
299     uint32_t l;
300     _is.read((char*)&l, 4);
301     l /= sizeof( typename VRToType<TVR>::Type );
302     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
303         l, _is);
304 }
305 void Write(std::ostream &_os) const {
306     uint16_t c[] = { Group, Element };
307     _os.write((char*)&c, 4);
308     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
309     _os.write((char*)&l, 4);
310     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
311         GetLength(), _os);
312 }
313 #endif
314
315 };
316
317 template<uint16_t Group, uint16_t Element, long long TVR >
318 class Attribute<Group, Element, TVR, VM::VM1>
319 {
320 public:
321     typedef typename VRToType<TVR>::Type ArrayType;
322     enum { VMType = VMToLength<VM::VM1>::Length };
323     //ArrayType Internal[VMToLength<VM>::Length];
324     ArrayType Internal;
325     GDCM_STATIC_ASSERT( VMToLength<VM::VM1>::Length == 1 );
326
327     // Make sure that user specified VR/VM are compatible with the public dictionary:
328     GDCM_STATIC_ASSERT( ((VR::VRType)TVR & (VR::VRType)(TagToType<Group, Element>::VRType)) );
329     GDCM_STATIC_ASSERT( ((VM::VMType)VM::VM1 & (VM::VMType)(TagToType<Group, Element>::VMType)) );
330     GDCM_STATIC_ASSERT( (((VR::VRType)TVR & VR::VR_VM1) && ((VM::VMType)VM::VM1 == VM::VM1) )
331         || !((VR::VRType)TVR & VR::VR_VM1) );
332
333     static Tag GetTag() { return Tag(Group, Element); }
334     static VR GetVR() { return (VR::VRType)TVR; }
335     static VM GetVM() { return (VM::VMType)VM::VM1; }
336
337     // The following two methods do make sense only in case of public element,
338     // when the template is instantiated with private element the VR/VM are simply
339     // defaulted to allow everything (see gdcmTagToType.h default template for TagToType)
340     static VR GetDictVR() { return (VR::VRType)(TagToType<Group, Element>::VRType); }
341     static VM GetDictVM() { return (VM::VMType)(TagToType<Group, Element>::VMType); }
342
343     // Some extra dummy checks:
344     // Data Elements with a VR of SQ, OF, OW, OB or UN shall always have a Value Multiplicity of one.
345
346     unsigned int GetNumberOfValues() const {
347         return VMToLength<VM::VM1>::Length;
348     }
349     // Implementation of Print is common to all Mode (ASCII/Binary)
350     // TODO: Can we print a \ when in ASCII...well I don't think so
351     // it would mean we used a bad VM then, right ?

```

```

352 void Print(std::ostream &os) const {
353     os << GetTag() << " ";
354     os << TagToType<Group,Element>::GetVRString() << " ";
355     os << TagToType<Group,Element>::GetVMString() << " ";
356     os << Internal; // VM is at least guarantee to be one
357 }
358 // copy:
359 //ArrayType GetValue(unsigned int idx = 0) {
360 //    assert( idx < GetNumberOfValues() );
361 //    return Internal[idx];
362 //}
363 //ArrayType operator[] (unsigned int idx) {
364 //    return GetValue(idx);
365 //}
366 // FIXME: is this always a good idea ?
367 // I do not think so, I prefer operator
368 //operator ArrayType () const { return Internal[0]; }
369
370 bool operator==(const Attribute &att) const
371 {
372     return std::equal(&Internal, &Internal+GetNumberOfValues(),
373         att.GetValues());
374 }
375 bool operator!=(const Attribute &att) const
376 {
377     return !std::equal(&Internal, &Internal+GetNumberOfValues(),
378         att.GetValues());
379 }
380 bool operator<(const Attribute &att) const
381 {
382     return std::lexicographical_compare(&Internal, &Internal+GetNumberOfValues(),
383         att.GetValues(), att.GetValues() + att.GetNumberOfValues() );
384 }
385
386 ArrayType &GetValue() {
387     // assert( idx < GetNumberOfValues() );
388     return Internal;
389 }
390 // ArrayType & operator[] (unsigned int idx) {
391 //     return GetValue(idx);
392 // }
393 // const reference
394 ArrayType const &GetValue() const {
395     //assert( idx < GetNumberOfValues() );
396     return Internal;
397 }
398 //ArrayType const & operator[] () const {
399 //    return GetValue();
400 //}
401 void SetValue(ArrayType v) {
402     // assert( idx < GetNumberOfValues() );
403     Internal = v;
404 }
405 /* void SetValues(const ArrayType* array, unsigned int numel = VMType) {
406 assert( array && numel && numel == GetNumberOfValues() );
407 // std::copy is smarter than a memcpy, and will call memcpy when POD type
408 std::copy(array, array+numel, Internal);
409 }
410 */
411
412 // FIXME Should we remove this function ?
413 const ArrayType* GetValues() const {
414     return &Internal;
415 }
416
417 // API to talk to the run-time layer: gdcm::DataElement
418 DataElement GetAsDataElement() const {
419     DataElement ret( Tag(Group,Element) );
420     std::ostringstream os;
421     // os.imbue(std::locale::classic()); // This is not required AFAIK
422     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(&Internal,
423         GetNumberOfValues(),os);
424     ret.SetVR( GetVR() );
425     assert( ret.GetVR() != VR::SQ );
426     if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
427     {
428         if( GetVR() != VR::UI )
429         {
430             if( os.str().size() % 2 )
431             {
432                 os << " ";

```

```

433     }
434 }
435 }
436 VL::Type osStrSize = (VL::Type)os.str().size();
437 ret.SetByteValue( os.str().c_str(), osStrSize );
438 return ret;
439 }
440
441 void SetFromDataElement(DataElement const &de) {
442     // This is kind of hackish but since I do not generate other element than the first one: 0x6000 I
443     // should be ok:
444     assert( Tag(Group,Element) == de.GetTag() || Group == 0x6000 || Group == 0x5000 );
445     assert( GetVR() != VR::INVALID );
446     assert( GetVR().Compatible( de.GetVR() ) || de.GetVR() == VR::INVALID ); // In case of VR::INVALID
447     // cannot use the & operator
448     if( de.IsEmpty() ) return;
449     const ByteValue *bv = de.GetByteValue();
450 #ifdef GDCM_WORDS_BIGENDIAN
451     if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
452 #else
453     if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
454 #endif
455     {
456         SetByteValue(bv);
457     }
458     else
459     {
460         SetByteValueNoSwap(bv);
461     }
462 }
463
464 void Set(DataSet const &ds) {
465     SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
466 }
467
468 void SetFromDataSet(DataSet const &ds) {
469     if( ds.FindDataElement( Tag(Group,Element) ) &&
470         !ds.GetDataElement( Tag(Group,Element) ).IsEmpty() )
471     {
472         SetFromDataElement( ds.GetDataElement( Tag(Group,Element) ) );
473     }
474 }
475
476 protected:
477 void SetByteValueNoSwap(const ByteValue *bv) {
478     if( !bv ) return; // That would be bad...
479     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
480     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
481     // {
482     //     // always do a copy !
483     //     SetValues(bv->GetPointer(), bv->GetLength());
484     // }
485     //else
486     {
487         std::stringstream ss;
488         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
489         ss.str( s );
490         EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(&Internal,
491             GetNumberOfValues(),ss);
492     }
493 }
494
495 void SetByteValue(const ByteValue *bv) {
496     if( !bv ) return; // That would be bad...
497     assert( bv->GetPointer() && bv->GetLength() ); // [123]C element can be empty
498     //if( VRToEncoding<TVR>::Mode == VR::VRBINARY )
499     // {
500     //     // always do a copy !
501     //     SetValues(bv->GetPointer(), bv->GetLength());
502     // }
503     //else
504     {
505         std::stringstream ss;
506         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
507         ss.str( s );
508         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(&Internal,
509             GetNumberOfValues(),ss);
510     }
511 }
512
513 #if 0 // TODO FIXME the implicit way:
514 // explicit:
515 void Read(std::istream &_is) {
516     const uint16_t cref[] = { Group, Element };
517     uint16_t c[2];
518     _is.read((char*)&c, sizeof(c));

```

```

512     assert( c[0] == cref[0] && c[1] == cref[1] );
513     char vr[2];
514     _is.read(vr, 2); // Check consistency ?
515     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
516     uint32_t l = VRVLSize< (TVR & VR::VL32) >::Read(_is);
517     l /= sizeof( typename VRToType<TVR>::Type );
518     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
519         l, _is);
520 }
521 void Write(std::ostream &_os) const {
522     uint16_t c[] = { Group, Element };
523     _os.write((char*)&c, 4);
524     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
525     _os.write((char*)&l, 4);
526     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
527         GetLength(), _os);
528 }
529 void Read(std::istream &_is) {
530     uint16_t cref[] = { Group, Element };
531     uint16_t c[2];
532     _is.read((char*)&c, 4);
533     const uint32_t lref = GetLength() * sizeof( typename VRToType<TVR>::Type );
534     uint32_t l;
535     _is.read((char*)&l, 4);
536     l /= sizeof( typename VRToType<TVR>::Type );
537     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
538         l, _is);
539 }
540 void Write(std::ostream &_os) const {
541     uint16_t c[] = { Group, Element };
542     _os.write((char*)&c, 4);
543     uint32_t l = GetLength() * sizeof( typename VRToType<TVR>::Type );
544     _os.write((char*)&l, 4);
545     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
546         GetLength(), _os);
547 }
548 #endif
549 };
550 };
551
552 // No need to repeat default template arg, since primary template
553 // will be used to generate the default arguments
554 template<uint16_t Group, uint16_t Element, long long TVR >
555 class Attribute<Group, Element, TVR, VM::VM1_n>
556 {
557 public:
558     typedef typename VRToType<TVR>::Type ArrayType;
559
560     // Make sure that user specified VR/VM are compatible with the public dictionary:
561     GDCM_STATIC_ASSERT( ((VR::VRType)TVR & (VR::VRType)(TagToType<Group, Element>::VRType)) );
562     GDCM_STATIC_ASSERT( (VM::VM1_n & (VM::VMType)(TagToType<Group, Element>::VMType)) );
563     GDCM_STATIC_ASSERT( (((VR::VRType)TVR & VR::VR_VM1) && ((VM::VMType)TagToType<Group, Element>::VMType ==
564         VM::VM1) )
565         || !((VR::VRType)TVR & VR::VR_VM1) ) );
566
567     static Tag GetTag() { return Tag(Group, Element); }
568     static VR GetVR() { return (VR::VRType)TVR; }
569     static VM GetVM() { return VM::VM1_n; }
570
571     static VR GetDictVR() { return (VR::VRType)(TagToType<Group, Element>::VRType); }
572     static VM GetDictVM() { return GetVM(); }
573
574     // This the way to prevent default initialization
575     explicit Attribute() { Internal=nullptr; Length=0; Own = true; }
576     ~Attribute() {
577         if( Own ) {
578             delete[] Internal;
579         }
580         Internal = nullptr; // paranoid
581     }
582
583     unsigned int GetNumberOfValues() const { return Length; }
584
585     void SetNumberOfValues(unsigned int numel)
586     {
587         SetValues(nullptr, numel, true);
588     }
589
590     const ArrayType* GetValues() const {
591         return Internal;
592     }
593 }

```

```

592 void Print(std::ostream &os) const {
593     os << GetTag() << " ";
594     os << GetVR() << " ";
595     os << GetVM() << " ";
596     os << Internal[0]; // VM is at least guarantee to be one
597     for(unsigned int i=1; i<GetNumberOfValues(); ++i)
598         os << "," << Internal[i];
599 }
600 ArrayType &GetValue(unsigned int idx = 0) {
601     assert( idx < GetNumberOfValues() );
602     return Internal[idx];
603 }
604 ArrayType &operator[] (unsigned int idx) {
605     return GetValue(idx);
606 }
607 // const reference
608 ArrayType const &GetValue(unsigned int idx = 0) const {
609     assert( idx < GetNumberOfValues() );
610     return Internal[idx];
611 }
612 ArrayType const & operator[] (unsigned int idx) const {
613     return GetValue(idx);
614 }
615 void SetValue(unsigned int idx, ArrayType v) {
616     assert( idx < GetNumberOfValues() );
617     Internal[idx] = v;
618 }
619 void SetValue(ArrayType v) { SetValue(0, v); }
620
621 void SetValues(const ArrayType *array, unsigned int numel, bool own = false)
622 {
623     if( Internal ) // were we used before ?
624     {
625         // yes !
626         if( Own ) delete[] Internal;
627         Internal = nullptr;
628     }
629     Own = own;
630     Length = numel;
631     assert( Internal == nullptr );
632     if( own ) // make a copy:
633     {
634         Internal = new ArrayType[numel];
635         if( array && numel )
636             std::copy(array, array+numel, Internal);
637     }
638     else // pass pointer
639     {
640         Internal = const_cast<ArrayType*>(array);
641     }
642     // postcondition
643     assert( numel == GetNumberOfValues() );
644 }
645
646 DataElement GetAsDataElement() const {
647     DataElement ret( GetTag() );
648     std::ostringstream os;
649     if( Internal )
650     {
651         EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
652             GetNumberOfValues(), os);
653         if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
654         {
655             if( GetVR() != VR::UI )
656             {
657                 if( os.str().size() % 2 )
658                 {
659                     os << " ";
660                 }
661             }
662         }
663     }
664     ret.SetVR( GetVR() );
665     assert( ret.GetVR() != VR::SQ );
666     VL::Type osStrSize = (VL::Type) os.str().size();
667     ret.SetByteValue( os.str().c_str(), osStrSize);
668     return ret;
669 }
670 void SetFromDataElement(DataElement const &de) {
671     // This is kind of hackish but since I do not generate other element than the first one: 0x6000 I
        should be ok:

```

```

672     assert( GetTag() == de.GetTag() || GetTag().GetGroup() == 0x6000
673             || GetTag().GetGroup() == 0x5000 );
674     assert( GetVR().Compatible( de.GetVR() ) ); // In case of VR::INVALID cannot use the & operator
675     assert( !de.IsEmpty() );
676     const ByteValue *bv = de.GetByteValue();
677     SetByteValue(bv);
678 }
679 void Set(DataSet const &ds) {
680     SetFromDataElement( ds.GetDataElement( GetTag() ) );
681 }
682 void SetFromDataSet(DataSet const &ds) {
683     if( ds.FindDataElement( GetTag() ) &&
684         !ds.GetDataElement( GetTag() ).IsEmpty() )
685     {
686         SetFromDataElement( ds.GetDataElement( GetTag() ) );
687     }
688 }
689 protected:
690 void SetByteValue(const ByteValue *bv) {
691     assert( bv ); // FIXME
692     std::stringstream ss;
693     std::string s = std::string( bv->GetPointer(), bv->GetLength() );
694     Length = bv->GetLength(); // HACK FIXME
695     ss.str( s );
696     ArrayType *internal;
697     ArrayType buffer[256];
698     if( bv->GetLength() < 256 )
699     {
700         internal = buffer;
701     }
702     else
703     {
704         internal = new ArrayType[ (VL::Type)bv->GetLength() ]; // over allocation
705     }
706     EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadComputeLength(internal, Length, ss);
707     SetValues( internal, Length, true );
708     if( !(bv->GetLength() < 256) )
709     {
710         delete[] internal;
711     }
712     //EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(internal,
713     //    GetNumberOfValues(), ss);
714 }
715
716 private:
717     ArrayType *Internal;
718     unsigned int Length;
719     bool Own : 1;
720 };
721
722 template<uint16_t Group, uint16_t Element, long long TVR>
723 class Attribute<Group, Element, TVR, VM::VM1_3> : public Attribute<Group, Element, TVR, VM::VM1_n>
724 {
725 public:
726     VM GetVM()const { return VM::VM1_3; }
727 };
728
729 template<uint16_t Group, uint16_t Element, long long TVR>
730 class Attribute<Group, Element, TVR, VM::VM1_8> : public Attribute<Group, Element, TVR, VM::VM1_n>
731 {
732 public:
733     VM GetVM()const { return VM::VM1_8; }
734 };
735
736 template<uint16_t Group, uint16_t Element, long long TVR>
737 class Attribute<Group, Element, TVR, VM::VM2_n> : public Attribute<Group, Element, TVR, VM::VM1_n>
738 {
739 public:
740     VM GetVM()const { return VM::VM2_n; }
741 };
742
743 template<uint16_t Group, uint16_t Element, long long TVR>
744 class Attribute<Group, Element, TVR, VM::VM2_2n> : public Attribute<Group, Element, TVR, VM::VM2_n>
745 {
746 public:
747     static VM GetVM() { return VM::VM2_2n; }
748 };
749
750 template<uint16_t Group, uint16_t Element, long long TVR>
751 class Attribute<Group, Element, TVR, VM::VM3_n> : public Attribute<Group, Element, TVR, VM::VM1_n>
752 {

```

```

753 public:
754     static VM GetVM() { return VM::VM3_n; }
755 };
756
757 template<uint16_t Group, uint16_t Element, long long TVR>
758 class Attribute<Group, Element, TVR, VM::VM3_3n> : public Attribute<Group, Element, TVR, VM::VM3_n>
759 {
760 public:
761     static VM GetVM() { return VM::VM3_3n; }
762 };
763
764
765 // For particular case for ASCII string
766 // WARNING: This template explicitly instantiates a particular
767 // EncodingImplementation THEREFORE it is required to be declared after the
768 // EncodingImplementation is needs (doh!)
769 #if 0
770 template<int TVM>
771 class Attribute<TVM>
772 {
773 public:
774     Attribute(const char array[])
775     {
776         unsigned int i = 0;
777         const char sep = '\\';
778         std::string sarray = array;
779         std::string::size_type pos1 = 0;
780         std::string::size_type pos2 = sarray.find(sep, pos1+1);
781         while(pos2 != std::string::npos)
782         {
783             Internal[i++] = sarray.substr(pos1, pos2-pos1);
784             pos1 = pos2+1;
785             pos2 = sarray.find(sep, pos1+1);
786         }
787         Internal[i] = sarray.substr(pos1, pos2-pos1);
788         // Shouldn't we do the contrary, since we know how many separators
789         // (and default behavior is to discard anything after the VM declared
790         assert( GetLength()-1 == i );
791     }
792
793     unsigned long GetLength()const {
794         return VMToLength<TVM>::Length;
795     }
796     // Implementation of Print is common to all Mode (ASCII/Binary)
797     void Print(std::ostream &_os)const {
798         _os << Internal[0]; // VM is at least guarantee to be one
799         for(int i=1; i<VMToLength<TVM>::Length; ++i)
800             _os << "," << Internal[i];
801     }
802
803     void Read(std::istream &_is) {
804         EncodingImplementation<VR::VRASCII>::Read(Internal, GetLength(), _is);
805     }
806     void Write(std::ostream &_os)const {
807         EncodingImplementation<VR::VRASCII>::Write(Internal, GetLength(), _os);
808     }
809 private:
810     typename String Internal[VMToLength<TVM>::Length];
811 };
812
813 template< int TVM>
814 class Attribute<VR::PN, TVM> : public StringAttribute<TVM>
815 {
816 };
817 #endif
818
819 #if 0
820
821 // Implementation for the undefined length (dynamically allocated array)
822 template<int TVR>
823 class Attribute<TVR, VM::VM1_n>
824 {
825 public:
826     // This the way to prevent default initialization
827     explicit Attribute() { Internal=0; Length=0; }
828     ~Attribute() {
829         delete[] Internal;
830         Internal = 0;
831     }
832
833     // Length manipulation

```



```

834 // SetLength should really be protected anyway...all operation
835 // should go through SetArray
836 unsigned long GetLength()const { return Length; }
837 typedef typename VRToType<TVR>::Type ArrayType;
838 void SetLength(unsigned long len) {
839     const unsigned int size = sizeof(ArrayType);
840     if( len ) {
841         if( len > Length ) {
842             // perform realloc
843             assert( (len / size) * size == len );
844             ArrayType *internal = new ArrayType[len / size];
845             memcpy(internal, Internal, Length * size);
846             delete[] Internal;
847             Internal = internal;
848         }
849     }
850     Length = len / size;
851 }
852
853 // If save is set to zero user should not delete the pointer
854 //void SetArray(const typename VRToType<TVR>::Type *array, int len, bool save = false)
855 void SetArray(const ArrayType *array, unsigned long len,
856     bool save = false) {
857     if( save ) {
858         SetLength(len); // realloc
859         memcpy(Internal, array, len/*sizeof(ArrayType)*/);
860     }
861     else {
862         // TODO rewrite this stupid code:
863         Length = len;
864         //Internal = array;
865         assert(0);
866     }
867 }
868 // Implementation of Print is common to all Mode (ASCII/Binary)
869 void Print(std::ostream &_os)const {
870     assert( Length );
871     assert( Internal );
872     _os << Internal[0]; // VM is at least guarantee to be one
873     const unsigned long length = GetLength() < 25 ? GetLength() : 25;
874     for(unsigned long i=1; i<length; ++i)
875         _os << "," << Internal[i];
876 }
877 void Read(std::istream &_is) {
878     EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
879         GetLength(),_is);
880 }
881 void Write(std::ostream &_os)const {
882     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
883         GetLength(),_os);
884 }
885
886 Attribute(const Attribute&_val) {
887     if( this != &_amp;val ) {
888         *this = _val;
889     }
890 }
891
892 Attribute &operator=(const Attribute &_val) {
893     Length = 0; // SYITF
894     Internal = 0;
895     SetArray(_val.Internal, _val.Length, true);
896     return *this;
897 }
898
899 private:
900     typename VRToType<TVR>::Type *Internal;
901     unsigned long Length; // unsigned int ??
902 };
903
904 //template <int TVM = VM::VM1_n>
905 //class Attribute<VR::OB, TVM > : public Attribute<VR::OB, VM::VM1_n> {};
906
907 // Partial specialization for derivatives of 1-n : 2-n, 3-n ...
908 template<int TVR>
909 class Attribute<TVR, VM::VM2_n> : public Attribute<TVR, VM::VM1_n>
910 {
911 public:
912     typedef Attribute<TVR, VM::VM1_n> Parent;
913     void SetLength(int len) {
914         if( len <= 1 ) return;

```

```

915     Parent::SetLength(len);
916 }
917 };
918 template<int TVR>
919 class Attribute<TVR, VM::VM2_n> : public Attribute<TVR, VM::VM2_n>
920 {
921 public:
922     typedef Attribute<TVR, VM::VM2_n> Parent;
923     void SetLength(int len) {
924         if( len % 2 ) return;
925         Parent::SetLength(len);
926     }
927 };
928 template<int TVR>
929 class Attribute<TVR, VM::VM3_n> : public Attribute<TVR, VM::VM1_n>
930 {
931 public:
932     typedef Attribute<TVR, VM::VM1_n> Parent;
933     void SetLength(int len) {
934         if( len <= 2 ) return;
935         Parent::SetLength(len);
936     }
937 };
938 template<int TVR>
939 class Attribute<TVR, VM::VM3_3n> : public Attribute<TVR, VM::VM3_n>
940 {
941 public:
942     typedef Attribute<TVR, VM::VM3_n> Parent;
943     void SetLength(int len) {
944         if( len % 3 ) return;
945         Parent::SetLength(len);
946     }
947 };
948
949
950 //template<int T> struct VRToLength;
951 //template<> struct VRToLength<VR::AS>
952 //{ enum { Length = VM::VM1 }; }
953 //template<>
954 //class Attribute<VR::AS> : public Attribute<VR::AS, VRToLength<VR::AS>::Length >
955
956 // only 0010 1010 AS 1 Patient's Age
957 template<>
958 class Attribute<VR::AS, VM::VM5>
959 {
960 public:
961     char Internal[VMToLength<VM::VM5>::Length];
962     void Print(std::ostream &_os) const {
963         _os << Internal;
964     }
965 };
966
967 template<>
968 class Attribute<VR::OB, VM::VM1> : public Attribute<VR::OB, VM::VM1_n> {};
969 // Make it impossible to compile any other cases:
970 template<int TVM> class Attribute<VR::OB, TVM>;
971
972 // Same for OW:
973 template<>
974 class Attribute<VR::OW, VM::VM1> : public Attribute<VR::OW, VM::VM1_n> {};
975 // Make it impossible to compile any other cases:
976 template<int TVM> class Attribute<VR::OW, TVM>;
977 #endif
978
979 #if 0
980 template<>
981 class Attribute<0x7fe0,0x0010, VR::OW, VM::VM1>
982 {
983 public:
984     char *Internal;
985     unsigned long Length; // unsigned int ??
986
987     void Print(std::ostream &_os) const {
988         _os << Internal[0];
989     }
990     void SetBytes(char *bytes, unsigned long length) {
991         Internal = bytes;
992         Length = length;
993     }
994     void Read(std::istream &_is) {
995         uint16_t c[2];

```

```

996     _is.read((char*)&c, 4);
997     uint32_t l;
998     _is.read((char*)&l, 4);
999     Length = l;
1000    _is.read( Internal, Length );
1001    }
1002    void Write(std::ostream &_os) const {
1003        uint16_t c[] = {0x7fe0, 0x0010};
1004        _os.write((char*)&c, 4);
1005        _os.write((char*)&Length, 4);
1006        _os.write( Internal, Length );
1007    }
1008 };
1009 #endif
1010
1011 /*
1012 // Removing Attribute for SQ for now...
1013 template<uint16_t Group, uint16_t Element, typename SQA>
1014 class Attribute<Group,Element, VR::SQ, VM::VMI, SQA>
1015 {
1016 public:
1017     SQA sqa;
1018     void Print(std::ostream &_os) const {
1019         _os << Tag(Group,Element);
1020         sqa.Print(_os << std::endl << '\t');
1021     }
1022     void Write(std::ostream &_os) const {
1023         uint16_t c[] = {Group, Element};
1024         _os.write((char*)&c, 4);
1025         uint32_t undef = 0xffffffff;
1026         _os.write((char*)&undef, 4);
1027         uint16_t item_beg[] = {0xfffe, 0x000};
1028         _os.write((char*)&item_beg, 4);
1029         _os.write((char*)&undef, 4);
1030         sqa.Write(_os);
1031         uint16_t item_end[] = {0xfffe, 0x00d};
1032         _os.write((char*)&item_end, 4);
1033         uint32_t zero = 0x0;
1034         _os.write((char*)&zero, 4);
1035         uint16_t seq_end[] = {0xfffe, 0x0dd};
1036         _os.write((char*)&seq_end, 4);
1037         _os.write((char*)&zero, 4);
1038     }
1039 };
1040 */
1041
1042 } // namespace gdcm_ns
1043
1044 #endif //GDCMATTRIBUTE_H

```

## 11.111 gdcmBasicOffsetTable.h File Reference

#include "gdcmFragment.h"

Include dependency graph for gdcmBasicOffsetTable.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::BasicOffsetTable](#)  
Class to represent a *BasicOffsetTable*.

### Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcmm::operator<< (std::ostream &os, const BasicOffsetTable &val)`

### 11.112 gdcmmBasicOffsetTable.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMBASICOFFSETTABLE_H
16 #define GDCMBASICOFFSETTABLE_H
17
18 #include "gdcmmFragment.h"
19
20 namespace gdcmm_ns
21 {
22     class GDCM_EXPORT BasicOffsetTable : public Fragment
23     {
24     protected:
25     // void SetTag(const Tag &t);
26     public:
27         BasicOffsetTable() : Fragment() {}
28         friend std::ostream &operator<<(std::ostream &os, const BasicOffsetTable &val);
29
30     /*
31     VL GetLength() const {
32     assert( !ValueLengthField.IsUndefined() );
33     assert( !ValueField || ValueField->GetLength() == ValueLengthField );
34     return TagField.GetLength() + ValueLengthField.GetLength()
35     + ValueLengthField;
36     }
37     */
38
39     template <typename TSwap>
40     std::istream &Read(std::istream &is) {
41         // Superclass
42         const Tag itemStart(0xffff, 0xe000);
43         const Tag seqDelItem(0xffff, 0xe00d);
44         if( !TagField.Read<TSwap>(is) )
45         {
46             assert(0 && "Should not happen");
47             return is;
48         }
49         //assert( TagField == itemStart );
50         if( TagField != itemStart )
51         {
52             // Bug_Siemens_PrivateIconNoItem.dcm
53             //gdcmmDebugMacro( "Could be Bug_Siemens_PrivateIconNoItem.dcm" );
54             ParseException pe;
55             pe.SetLastElement(*this);
56             //throw "SIEMENS Icon thingy";
57             throw pe;
58         }
59         if( !ValueLengthField.Read<TSwap>(is) )
60         {
61             assert(0 && "Should not happen");
62             return is;
63         }
64         // Self
65         SmartPointer<ByteValue> bv = new ByteValue;
66         bv->SetLength(ValueLengthField);
67         if( !bv->Read<TSwap>(is) )

```

```

72     {
73         gdcmAssertAlwaysMacro(0 && "Should not happen");
74         return is;
75     }
76     ValueField = bv;
77     return is;
78 }
79
80 /*
81 template <typename TSwap>
82 std::ostream &Write(std::ostream &os) const {
83     const Tag itemStart(0xfffe, 0xe000);
84     const Tag seqDelItem(0xfffe, 0xe0dd);
85     if( !TagField.Write<TSwap>(os) )
86     {
87         assert(0 && "Should not happen");
88         return os;
89     }
90     assert( TagField == itemStart );
91     if( !ValueLengthField.Write<TSwap>(os) )
92     {
93         assert(0 && "Should not happen");
94         return os;
95     }
96     if( ValueLengthField )
97     {
98         // Self
99         const ByteValue *bv = GetByteValue();
100        assert( bv );
101        assert( bv->GetLength() == ValueLengthField );
102        if( !bv->Write<TSwap>(os) )
103        {
104            assert(0 && "Should not happen");
105            return os;
106        }
107    }
108    return os;
109 }
110 */
111 };
112 //-----
113 inline std::ostream &operator<<(std::ostream &os, const BasicOffsetTable &val)
114 {
115     os << " BasicOffsetTable Length=" << val.ValueLengthField << std::endl;
116     if( val.ValueField )
117     {
118         const ByteValue *bv = val.GetByteValue();
119         assert( bv );
120         os << *bv;
121     }
122 }
123 return os;
124 }
125
126
127 } // end namespace gdcm_ns
128
129 #endif //GDCMBASICOFFSETTABLE_H

```

## 11.113 gdcmByteBuffer.h File Reference

```

#include "gdcmTypes.h"
#include <vector>
#include <assert.h>
#include <string.h>

```

Include dependency graph for gdcmByteBuffer.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::ByteBuffer](#)  
*ByteBuffer.*

## Namespaces

- namespace [gdcm](#)

### 11.114 gdcmByteBuffer.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBYTEBUFFER_H
15 #define GDCMBYTEBUFFER_H
16
17 #include "gdcmTypes.h"
18 #include <vector>
19 #include <assert.h>
20 #include <string.h> // memmove
21
22 #error should not be used
23
24 namespace gdcm
25 {
26     class ByteBuffer
27     {
28     public:
29         static const int InitBufferSize = 1024;
30         ByteBuffer() : Start(0), End(0), Limit(0) {}
31         char *Get(int len)
32         {
33             char *buffer = &Internal[0];
34             if (len > Limit - End)
35             {
36                 // FIXME avoid integer overflow
37                 int neededSize = len + (End - Start);
38                 if (neededSize <= Limit - buffer)
39                 {
40                     memmove(buffer, Start, End - Start);
41                     End = buffer + (End - Start);
42                     Start = buffer;
43                 }
44                 else
45                 {
46                     char *newBuf;
47                     int bufferSize = Limit - Start;
48                     if ( bufferSize == 0 )
49                     {
50                         bufferSize = InitBufferSize;
51                     }
52                     do
53                     {
54                         bufferSize *= 2;
55                     } while (bufferSize < neededSize);
56                     //newBuf = malloc(bufferSize);
57                     try
58                     {
59                         Internal.reserve(bufferSize);
60                         newBuf = &Internal[0];
61                     }
62                     catch(...)
63                     {
64                         //errorCode = NoMemoryError;
65                         return 0;
66                     }
67                     Limit = newBuf + bufferSize;

```

```

76
77     if (Start)
78     {
79         memcpy(newBuf, Start, End - Start);
80     }
81     End = newBuf + (End - Start);
82     Start = /*buffer ==*/ newBuf;
83 }
84
85 assert( (int)Internal.capacity() >= len );
86 return End;
87 }
88
89 void UpdatePosition() {}
90 void ShiftEnd(int len) {
91     End += len;
92 }
93 const char *GetStart() const {
94     return Start;
95 }
96
97 private:
98     typedef std::vector<char> CharVector;
99     const char *Start;
100     char *End;
101     const char *Limit;
102     CharVector Internal;
103 };
104
105 } // end namespace gdcm
106
107 #endif //GDCMBYTEBUFFER_H

```

## 11.115 gdcmByteSwapFilter.h File Reference

#include "gdcmDataSet.h"

Include dependency graph for gdcmByteSwapFilter.h:

### Classes

- class [gdcm::ByteSwapFilter](#)  
*ByteSwapFilter.*

### Namespaces

- namespace [gdcm](#)

## 11.116 gdcmByteSwapFilter.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
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```

```

10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBYTESWAPFILTER_H
15 #define GDCMBYTESWAPFILTER_H
16
17 #include "gdcmDataSet.h"
18
19 namespace gdcm
20 {
21
22
23
24
25
26
27 class GDCM_EXPORT ByteSwapFilter
28 {
29 public:
30     ByteSwapFilter(DataSet& ds):DS(ds),ByteSwapTag(false) {}
31     ~ByteSwapFilter();
32     ByteSwapFilter(const ByteSwapFilter &) = delete;
33     ByteSwapFilter& operator=(const ByteSwapFilter &) = delete;
34
35     bool ByteSwap();
36     void SetByteSwapTag(bool b) { ByteSwapTag = b; }
37
38 private:
39     DataSet &DS;
40     bool ByteSwapTag;
41
42 };
43
44 } // end namespace gdcm
45
46 #endif //GDCMBYTESWAPFILTER_H

```

## 11.117 gdcmByteValue.h File Reference

```

#include "gdcmValue.h"
#include "gdcmTrace.h"
#include "gdcmVL.h"
#include <vector>
#include <iterator>
#include <iomanip>
#include <algorithm>

```

Include dependency graph for gdcmByteValue.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::ByteValue](#)  
*Class to represent binary value (array of bytes)*

### Namespaces

- namespace [gdcm](#)



## 11.118 gdcmByteValue.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBYTEVALUE_H
15 #define GDCMBYTEVALUE_H
16
17 #include "gdcmValue.h"
18 #include "gdcmTrace.h"
19 #include "gdcmVL.h"
20
21 #include <vector>
22 #include <iterator>
23 #include <iomanip>
24 #include <algorithm>
25
26 namespace gdcm_ns
27 {
28 #if !defined(SWIGPYTHON) && !defined(SWIGSHARP) && !defined(SWIGJAVA) && !defined(SWIGPHP)
29 using namespace gdcm;
30 #endif
31 class GDCM_EXPORT ByteValue : public Value
32 {
33 public:
34     ByteValue(const char* array = nullptr, VL const &vl = 0):
35     {
36         Internal(array, array+vl),Length(vl) {
37             if( vl.IsOdd() )
38             {
39                 gdcmDebugMacro( "Odd length" );
40                 Internal.resize(vl+1);
41                 ++Length;
42             }
43         }
44     }
45
46     ByteValue(std::vector<char> &v):Internal(v),Length((uint32_t)v.size()) {}
47     //ByteValue(std::ostringstream const &os) {
48     //    (void)os;
49     //    assert(0); // TODO
50     //}
51     ~ByteValue()override {
52         Internal.clear();
53     }
54
55     // When 'dumping' dicom file we still have some information from
56     // Either the VR: eg LO (private tag)
57     void PrintASCII(std::ostream &os, VL maxlength) const;
58
59     void PrintHex(std::ostream &os, VL maxlength) const;
60
61     // Either from Element Number (== 0x0000)
62     void PrintGroupLength(std::ostream &os) {
63         assert( Length == 2 );
64         (void)os;
65     }
66
67     bool IsEmpty()const {
68     #if 0
69         if( Internal.empty() ) assert( Length == 0 );
70         return Internal.empty();
71     #else
72         return Length == 0;
73     #endif
74     }
75
76     VL GetLength()const override { return Length; }
77
78     VL ComputeLength()const { return Length + Length % 2; }
79     // Does a reallocation

```

```

82 void SetLength(VL vl) override;
83
84 operator const std::vector<char>& () const { return Internal; }
85
86 ByteValue &operator=(const ByteValue &val) {
87     Internal = val.Internal;
88     Length = val.Length;
89     return *this;
90 }
91
92 bool operator==(const ByteValue &val) const {
93     if( Length != val.Length )
94         return false;
95     if( Internal == val.Internal )
96         return true;
97     return false;
98 }
99 bool operator==(const Value &val) const override
100 {
101     const ByteValue &bv = dynamic_cast<const ByteValue&>(val);
102     return Length == bv.Length && Internal == bv.Internal;
103 }
104
105 void Append(ByteValue const & bv);
106
107 void Clear() override {
108     Internal.clear();
109 }
110 // Use that only if you understand what you are doing
111 const char *GetPointer() const {
112     if(!Internal.empty()) return &Internal[0];
113     return nullptr;
114 }
115 // Use that only if you really understand what you are doing
116 const void *GetVoidPointer() const {
117     if(!Internal.empty()) return &Internal[0];
118     return nullptr;
119 }
120 void *GetVoidPointer() {
121     if(!Internal.empty()) return &Internal[0];
122     return nullptr;
123 }
124 void Fill(char c) {
125     //if( Internal.empty() ) return;
126     std::vector<char>::iterator it = Internal.begin();
127     for(; it != Internal.end(); ++it) *it = c;
128 }
129 bool GetBuffer(char *buffer, unsigned long length) const;
130 bool WriteBuffer(std::ostream &os) const {
131     if( Length ) {
132         //assert( Internal.size() <= Length );
133         assert( !(Internal.size() % 2) );
134         os.write(&Internal[0], Internal.size() );
135     }
136     return true;
137 }
138
139 template <typename TSwap, typename TType>
140 std::istream &Read(std::istream &is, bool readvalues = true) {
141     // If Length is odd we have detected that in SetLength
142     // and calling std::vector::resize make sure to allocate *AND*
143     // initialize values to 0 so we are sure to have a \0 at the end
144     // even in this case
145     if(Length)
146     {
147         if( readvalues )
148         {
149             is.read(&Internal[0], Length);
150             assert( Internal.size() == Length || Internal.size() == Length + 1 );
151             TSwap::SwapArray((TType*)GetVoidPointer(), Internal.size() / sizeof(TType) );
152         }
153         else
154         {
155             is.seekg(Length, std::ios::cur);
156         }
157     }
158     return is;
159 }
160
161 template <typename TSwap>
162 std::istream &Read(std::istream &is) {

```

```

163     return Read<TSwap,uint8_t>(is);
164 }
165
166
167 template <typename TSwap, typename TType>
168 std::ostream const &Write(std::ostream &os) const {
169     assert( !(Internal.size() % 2) );
170     if( !Internal.empty() ) {
171         //os.write(&Internal[0], Internal.size());
172         std::vector<char> copy = Internal;
173         TSwap::SwapArray((TType*)(void*)&copy[0], Internal.size() / sizeof(TType) );
174         os.write(&copy[0], copy.size());
175     }
176     return os;
177 }
178
179 template <typename TSwap>
180 std::ostream const &Write(std::ostream &os) const {
181     return Write<TSwap,uint8_t>(os);
182 }
183
184
185 bool IsPrintable(VL length) const {
186     assert( length <= Length );
187     for(unsigned int i=0; i<length; i++)
188     {
189         if ( i == (length-1) && Internal[i] == '\\0' ) continue;
190         if ( !( isprint((unsigned char)Internal[i]) || isspace((unsigned char)Internal[i]) ) )
191         {
192             //gdcmWarningMacro( "Cannot print : " « i );
193             return false;
194         }
195     }
196     return true;
197 }
198
199 void PrintPNXML(std::ostream &os) const;
200 void PrintASCIIXML(std::ostream &os) const;
201 void PrintHexXML(std::ostream &os) const;
202 protected:
203 void Print(std::ostream &os) const override {
204     // This is perfectly valid to have a Length = 0 , so we cannot check
205     // the length for printing
206     if( !Internal.empty() )
207     {
208         if( IsPrintable(Length) )
209         {
210             // WARNING: Internal.end() != Internal.begin()+Length
211             std::vector<char>::size_type length = Length;
212             if( Internal.back() == 0 ) --length;
213             std::copy(Internal.begin(), Internal.begin()+length,
214                 std::ostream_iterator<char>(os));
215         }
216         else
217             os << "Loaded:" « Internal.size();
218     }
219     else
220     {
221         //os << "Not Loaded";
222         os << "(no value available)";
223     }
224 }
225
226 /*
227 //Introduce check for invalid XML characters
228 friend std::ostream& operator<<(std::ostream &os,const char c);
229 */
230
231 void SetLengthOnly(VL vl) override {
232     Length = vl;
233 }
234
235 private:
236     std::vector<char> Internal;
237
238     // WARNING Length IS NOT Internal.size() some *featured* DICOM
239     // implementation define odd length, we always load them as even number
240     // of byte, so we need to keep the right Length
241     VL Length;
242 };
243
244 } // end namespace gdcm_ns
245
246

```

```
251 #endif //GDCMBYTEVALUE_H
```

## 11.119 gdcmCodeString.h File Reference

```
#include "gdcmString.h"
```

Include dependency graph for gdcmCodeString.h:

### Classes

- class [gdcm::CodeString](#)  
*CodeString.*

### Namespaces

- namespace [gdcm](#)

### Functions

- bool [gdcm::operator!=](#) (const CodeString &ref, const CodeString &cs)
- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const CodeString &str)
- bool [gdcm::operator==](#) (const CodeString &ref, const CodeString &cs)

## 11.120 gdcmCodeString.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCODESTRING_H
15 #define GDCMCODESTRING_H
16
17 #include "gdcmString.h"
18
19 namespace gdcm
20 {
21
22 // Note to myself: because note all wrapped language support exception
23 // we could not support throwing an exception during object construction.
24 class GDCM_EXPORT CodeString
25 {
26     friend std::ostream& operator<< (std::ostream& os, const CodeString& str);
27     friend bool operator==(const CodeString &ref, const CodeString& cs);
28     friend bool operator!=(const CodeString &ref, const CodeString& cs);
29     typedef String<'\\',16> InternalClass;
```

```

47 public:
48     typedef InternalClass::value_type          value_type;
49     typedef InternalClass::pointer             pointer;
50     typedef InternalClass::reference            reference;
51     typedef InternalClass::const_reference      const_reference;
52     typedef InternalClass::size_type            size_type;
53     typedef InternalClass::difference_type      difference_type;
54     typedef InternalClass::iterator             iterator;
55     typedef InternalClass::const_iterator       const_iterator;
56     typedef InternalClass::reverse_iterator     reverse_iterator;
57     typedef InternalClass::const_reverse_iterator const_reverse_iterator;
58
60     CodeString(): Internal() {}
61     CodeString(const value_type* s): Internal(s) { Internal = Internal.Trim(); }
62     CodeString(const value_type* s, size_type n): Internal(s, n) {
63         Internal = Internal.Trim(); }
64     CodeString(const InternalClass& s, size_type pos=0, size_type n=InternalClass::npos):
65         Internal(s, pos, n) { Internal = Internal.Trim(); }
66
68     bool IsValid() const;
69
71     std::string GetAsString()const {
72         return Internal;
73     }
74
76     size_type Size()const { return Internal.size(); }
77
78 protected:
79     std::string TrimInternal()const {
80         return Internal.Trim();
81     }
82
83 private:
84     String<'\\',16> Internal;
85 };
86
87 inline std::ostream& operator<< (std::ostream& os, const CodeString& str)
88 {
89     os << str.Internal;
90     return os;
91 }
92
93 inline bool operator==(const CodeString &ref, const CodeString& cs)
94 {
95     return ref.Internal == cs.Internal;
96 }
97 inline bool operator!=(const CodeString &ref, const CodeString& cs)
98 {
99     return ref.Internal != cs.Internal;
100 }
101
102
103 } // end namespace gdcm
104
105 #endif //GDCMCODESTRING_H

```

## 11.121 gdcmCP246ExplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmCP246ExplicitDataElement.txx"

```

Include dependency graph for gdcmCP246ExplicitDataElement.h:

### Classes

- class [gdcm::CP246ExplicitDataElement](#)  
Class to read/write a *DataElement* as CP246Explicit Data *Element*.

## Namespaces

- namespace [gdcm](#)

## 11.122 gdcmCP246ExplicitDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCP246EXPLICITDATAELEMENT_H
15 #define GDCMCP246EXPLICITDATAELEMENT_H
16
17 #include "gdcmDataElement.h"
18
19 namespace gdcm
20 {
21 // Data Element (CP246Explicit)
22 class GDCM_EXPORT CP246ExplicitDataElement : public DataElement
23 {
24 public:
25     VL GetLength() const;
26
27     template <typename TSwap>
28     std::istream &Read(std::istream &is);
29
30     template <typename TSwap>
31     std::istream &ReadPreValue(std::istream &is);
32
33     template <typename TSwap>
34     std::istream &ReadValue(std::istream &is, bool readvalues = true);
35
36     template <typename TSwap>
37     std::istream &ReadWithLength(std::istream &is, VL & length);
38
39     // PURPOSELY do not provide an implementation for writing !
40     //template <typename TSwap>
41     //const std::ostream &Write(std::ostream &os) const;
42 };
43
44 } // end namespace gdcm
45
46 #include "gdcmCP246ExplicitDataElement.txt"
47
48 #endif //GDCMCP246EXPLICITDATAELEMENT_H

```

## 11.123 gdcmCSAElement.h File Reference

```

#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"

```

Include dependency graph for gdcmCSAElement.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::CSAElement](#)  
*Class to represent a CSA [Element](#).*

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const CSAElement &val)

## 11.124 gdcmCSAElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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8
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 #ifndef GDCMCSAELEMENT_H
15 #define GDCMCSAELEMENT_H
16
17 #include "gdcmTag.h"
18 #include "gdcmVM.h"
19 #include "gdcmVR.h"
20 #include "gdcmByteValue.h"
21 #include "gdcmSmartPointer.h"
22
23 namespace gdcm
24 {
25     class GDCM_EXPORT CSAElement
26     {
27     public:
28         CSAElement(unsigned int kf = 0):KeyField(kf) {}
29
30         friend std::ostream& operator<<(std::ostream &os, const CSAElement &val);
31
32         unsigned int GetKey()const { return KeyField; }
33         void SetKey(unsigned int key) { KeyField = key; }
34
35         const char *GetName()const { return NameField.c_str(); }
36         void SetName(const char *name) { NameField = name; }
37
38         const VM& GetVM()const { return ValueMultiplicityField; }
39         void SetVM(const VM &vm) { ValueMultiplicityField = vm; }
40
41         VR const &GetVR()const { return VRField; }
42         void SetVR(VR const &vr) { VRField = vr; }
43
44         unsigned int GetSyngoDT()const { return SyngoDTField; }
45         void SetSyngoDT(unsigned int syngodt) { SyngoDTField = syngodt; }
46
47         unsigned int GetNoOfItems()const { return NoOfItemsField; }
48         void SetNoOfItems(unsigned int items) { NoOfItemsField = items; }
49     }
50
51
52
53
54
55
56
57
58
59

```

```

61 Value const &GetValue()const { return *DataField; }
62 Value &GetValue() { return *DataField; }
63 void SetValue(Value const & vl) {
64     //assert( DataField == 0 );
65     DataField = vl;
66 }
67
68 bool IsEmpty()const { return DataField == nullptr; }
69
70 void SetByteValue(const char *array, VL length)
71 {
72     ByteValue *bv = new ByteValue(array,length);
73     SetValue( *bv );
74 }
75
76 const ByteValue* GetByteValue()const {
77     // Get the raw pointer from the gdc::SmartPointer
78     const ByteValue *bv = dynamic_cast<const ByteValue*>(DataField.GetPointer());
79     return bv; // Will return NULL if not ByteValue
80 }
81
82 CSAElement(const CSAElement &_val)
83 {
84     if( this != &_amp;_val)
85     {
86         *this = _val;
87     }
88 }
89
90 bool operator<(const CSAElement &de)const
91 {
92     return GetKey() < de.GetKey();
93 }
94
95 CSAElement &operator=(const CSAElement &de)
96 = default;
97
98 bool operator==(const CSAElement &de)const
99 {
100     return KeyField == de.KeyField
101         && NameField == de.NameField
102         && ValueMultiplicityField == de.ValueMultiplicityField
103         && VRField == de.VRField
104         && SyngoDTField == de.SyngoDTField
105         //&& ValueField == de.ValueField;
106     ;
107 }
108
109 protected:
110 unsigned int KeyField;
111 std::string NameField;
112 VM ValueMultiplicityField;
113 VR VRField;
114 unsigned int SyngoDTField;
115 unsigned int NoOfItemsField;
116 typedef SmartPointer<Value> DataPtr;
117 DataPtr DataField;
118 };
119
120 //-----
121 inline std::ostream& operator<<(std::ostream &os, const CSAElement &val)
122 {
123     os << val.KeyField;
124     os << " - '" << val.NameField;
125     os << "' VM " << val.ValueMultiplicityField;
126     os << ", VR " << val.VRField;
127     os << ", SyngoDT " << val.SyngoDTField;
128     os << ", NoOfItems " << val.NoOfItemsField;
129     os << ", Data ";
130     if( val.DataField )
131     {
132         //val.DataField->Print( os << "' " );
133         const ByteValue * bv = dynamic_cast<ByteValue*>(&*val.DataField);
134         assert( bv );
135         const char * p = bv->GetPointer();
136         std::string str(p, p + bv->GetLength() );
137         if( val.ValueMultiplicityField == VM::VM1 )
138         {
139             os << "' " << str.c_str() << "'";
140         }
141         else
142         {
143             std::istringstream is( str );
144             std::string s;
145             bool sep = false;

```



```

146         while( std::getline(is, s, '\\') )
147         {
148             if( sep )
149             {
150                 os << '\\';
151             }
152             sep = true;
153             os << "'" << s.c_str() << "'";
154         }
155         //bv->Print( os << "' ' );
156         //os << "'";
157     }
158 }
159 return os;
160 }
161
162 } // end namespace gdcm
163
164 #endif //GDCMCSAELEMENT_H

```

## 11.125 gdcmCSAHeader.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmDataSet.h"
#include "gdcmCSAElement.h"
#include "gdcmMrProtocol.h"

```

Include dependency graph for gdcmCSAHeader.h:

### Classes

- class [gdcm::CSAHeader](#)  
Class for [CSAHeader](#).

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) ([std::ostream &os](#), const [CSAHeader](#) &d)

## 11.126 gdcmCSAHeader.h

[Go to the documentation of this file.](#)

```

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2
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```

```

11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCSAHEADER_H
15 #define GDCMCSAHEADER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmDataSet.h"
19 #include "gdcmCSAElement.h"
20 #include "gdcmMrProtocol.h"
21
22 namespace gdcm
23 {
24 /*
25 * Everything done in this code is for the sole purpose of writing interoperable
26 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
27 * If you believe anything in this code violates any law or any of your rights,
28 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
29 * find a solution.
30 */
31 //-----
32
33 class DataElement;
34 class PrivateTag;
35 class GDCM_EXPORT CSAHeader
36 {
37     friend std::ostream& operator<<(std::ostream &os, const CSAHeader &d);
38 public :
39     CSAHeader():InternalDataSet(),InternalType(UNKNOWN),InterfileData(nullptr) {};
40     ~CSAHeader() = default;
41
42     typedef enum {
43         UNKNOWN = 0,
44         SV10,
45         NOMAGIC,
46         DATASET_FORMAT,
47         INTERFILE,
48         ZEROED_OUT
49     } CSAHeaderType;
50
51     bool LoadFromDataElement(DataElement const &de);
52
53     void Print(std::ostream &os) const;
54
55     const DataSet& GetDataSet()const { return InternalDataSet; }
56
57     const char * GetInterfile()const { return InterfileData; }
58
59     CSAHeaderType GetFormat() const;
60
61     static const PrivateTag & GetCSAImageHeaderInfoTag();
62
63     static const PrivateTag & GetCSASeriesHeaderInfoTag();
64
65     static const PrivateTag & GetCSADataInfo();
66
67     const CSAElement &GetCSAELEMENTByName(const char *name);
68
69     bool FindCSAELEMENTByName(const char *name);
70
71     bool GetMrProtocol( const DataSet & ds, MrProtocol & mrProtocol );
72
73 protected:
74     const CSAElement& GetCSAEEnd() const;
75
76 private:
77     std::set<CSAELEMENT> InternalCSADataset;
78     DataSet InternalDataSet;
79     CSAHeaderType InternalType;
80     Tag DataElementTag;
81     static CSAELEMENT CSAEEnd;
82     const char *InterfileData;
83 };
84 //-----
85 inline std::ostream& operator<<(std::ostream &os, const CSAHeader &d)
86 {
87     d.Print( os );
88     return os;
89 }
90
91 } // end namespace gdcm

```

```

138 //-----
139 #endif //GDCMCSAHEADER_H

```

## 11.127 gdcmDataElement.h File Reference

```

#include "gdcmTag.h"
#include "gdcmVL.h"
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
#include <set>

```

Include dependency graph for gdcmDataElement.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::DataElement](#)  
Class to represent a Data [Element](#) either Implicit or Explicit.

### Namespaces

- namespace [gdcm](#)

### Functions

- bool [gdcm::operator!=](#) (const DataElement &lhs, const DataElement &rhs)
- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const DataElement &val)

## 11.128 gdcmDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDATAELEMENT_H
15 #define GDCMDATAELEMENT_H
16
17 #include "gdcmTag.h"
18 #include "gdcmVL.h"
19 #include "gdcmVR.h"
20 #include "gdcmByteValue.h"
21 #include "gdcmSmartPointer.h"
22

```

```

23 #include <set>
24
25 namespace gdcms
26 {
27 // Data Element
28 // Contains multiple fields:
29 // -> Tag
30 // -> Optional VR (Explicit Transfer Syntax)
31 // -> ValueLength
32 // -> Value
33 // TODO: This class SHOULD be pure virtual. I don't want a user
34 // to shoot himself in the foot.
35
36 class SequenceOfItems;
37 class SequenceOfFragments;
38 class GDCM_EXPORT DataElement
39 {
40 public:
41     DataElement(const Tag& t = Tag(0), const VL& vl = 0, const VR &vr =
        VR::INVALID:TagField(t),ValueLengthField(vl),VRField(vr),ValueField(nullptr) {}
42     //DataElement( Attribute const &att );
43
44     friend std::ostream& operator<<(std::ostream &_os, const DataElement &_val);
45
46     const Tag& GetTag()const { return TagField; }
47     Tag& GetTag() { return TagField; }
48     void SetTag(const Tag &t) { TagField = t; }
49
50     const VL& GetVL()const { return ValueLengthField; }
51     VL& GetVL() { return ValueLengthField; }
52     void SetVL(const VL &vl) { ValueLengthField = vl; }
53     void SetVLToUndefined();
54
55     VR const &GetVR()const { return VRField; }
56     void SetVR(VR const &vr) {
57         if( vr.IsVRFile() )
58             VRField = vr;
59     }
60
61     Value const &GetValue()const { gdcmsAssertAlwaysMacro(ValueField); return *ValueField; }
62     Value &GetValue() {
63         gdcmsAssertAlwaysMacro(ValueField);
64         return *ValueField;
65     }
66     void SetValue(Value const & vl) {
67         //assert( ValueField == 0 );
68         ValueField = vl;
69         ValueLengthField = vl.GetLength();
70     }
71     bool IsEmpty()const { return ValueField == nullptr || (GetByteValue() && GetByteValue()->IsEmpty()); }
72
73     void Empty() { ValueField = nullptr; ValueLengthField = 0; }
74
75     void Clear()
76     {
77         TagField = 0;
78         VRField = VR::INVALID;
79         ValueField = nullptr;
80         ValueLengthField = 0;
81     }
82
83     // Helper:
84     void SetByteValue(const char *array, VL length)
85     {
86         ByteValue *bv = new ByteValue(array,length);
87         SetValue( *bv );
88     }
89
90     const ByteValue* GetByteValue()const {
91         // Get the raw pointer from the gdcms::SmartPointer
92         const ByteValue *bv = dynamic_cast<const ByteValue*>(ValueField.GetPointer());
93         return bv; // Will return NULL if not ByteValue
94     }
95
96     SmartPointer<SequenceOfItems> GetValueAsSQ() const;
97
98     const SequenceOfFragments* GetSequenceOfFragments() const;
99     SequenceOfFragments* GetSequenceOfFragments();
100
101     bool IsUndefinedLength()const {
102         return ValueLengthField.IsUndefined();
103     }
104 }

```

```

156
157 DataElement(const DataElement &_val)
158 {
159     if( this != &_val)
160     {
161         *this = _val;
162     }
163 }
164
165 bool operator<(const DataElement &de) const
166 {
167     return GetTag() < de.GetTag();
168 }
169 DataElement &operator=(const DataElement &)
170     = default;
171
172 bool operator==(const DataElement &de) const
173 {
174     bool b = TagField == de.TagField
175         && ValueLengthField == de.ValueLengthField
176         && VRField == de.VRField;
177     if( !ValueField && !de.ValueField )
178     {
179         return b;
180     }
181     if( ValueField && de.ValueField )
182     {
183         return b && (*ValueField == *de.ValueField);
184     }
185     // ValueField != de.ValueField
186     return false;
187 }
188
189 // The following functionalities are dependent on:
190 // # The Transfer Syntax: Explicit or Implicit
191 // # The Byte encoding: Little Endian / Big Endian
192
193 /*
194 * The following was inspired by a C++ idiom: Curiously Recurring Template Pattern
195 * Ref: http://en.wikipedia.org/wiki/Curiously\_Recurring\_Template\_Pattern
196 * The typename TDE is typically a derived class *without* any data
197 * while TSwap is a simple template parameter to achieve byteswapping (and allow factorization of
198 * highly identical code)
199 */
200 template <typename TDE>
201 VL GetLength() const {
202     return static_cast<const TDE*>(this)->GetLength();
203 }
204
205 template <typename TDE, typename TSwap>
206 std::istream &Read(std::istream &is) {
207     return static_cast<TDE*>(this)->template Read<TSwap>(is);
208 }
209
210 template <typename TDE, typename TSwap>
211 std::istream &ReadOrSkip(std::istream &is, std::set<Tag> const &skiptags) {
212     (void)skiptags;
213     return static_cast<TDE*>(this)->template Read<TSwap>(is);
214 }
215
216 template <typename TDE, typename TSwap>
217 std::istream &ReadPreValue(std::istream &is, std::set<Tag> const &skiptags) {
218     (void)skiptags;
219     return static_cast<TDE*>(this)->template ReadPreValue<TSwap>(is);
220 }
221
222 template <typename TDE, typename TSwap>
223 std::istream &ReadValue(std::istream &is, std::set<Tag> const &skiptags) {
224     (void)skiptags;
225     return static_cast<TDE*>(this)->template ReadValue<TSwap>(is);
226 }
227
228 template <typename TDE, typename TSwap>
229 std::istream &ReadValueWithLength(std::istream &is, VL &length, std::set<Tag> const &skiptags) {
230     (void)skiptags;
231     return static_cast<TDE*>(this)->template ReadValueWithLength<TSwap>(is, length);
232 }
233
234 template <typename TDE, typename TSwap>
235 std::istream &ReadWithLength(std::istream &is, VL &length) {
236     return static_cast<TDE*>(this)->template ReadWithLength<TSwap>(is, length);
237 }

```

```

237     template <typename TDE, typename TSwap>
238     const std::ostream &Write(std::ostream &os) const {
239         return static_cast<const TDE*>(this)->template Write<TSwap>(os);
240     }
241
242 protected:
243     Tag TagField;
244     // This is the value read from the file, might be different from the length of Value Field
245     VL ValueLengthField; // Can be 0xFFFFFFFF
246
247     // Value Representation
248     VR VRField;
249     typedef SmartPointer<Value> ValuePtr;
250     ValuePtr ValueField;
251
252     void SetValueFieldLength( VL vl, bool readvalues );
253 };
254 //-----
255 inline std::ostream& operator<<(std::ostream &os, const DataElement &val)
256 {
257     os << val.TagField;
258     os << "\t" << val.VRField;
259     os << "\t" << val.ValueLengthField;
260     if( val.ValueField )
261     {
262         val.ValueField->Print( os << "\t" );
263     }
264     return os;
265 }
266
267 inline bool operator!=(const DataElement& lhs, const DataElement& rhs)
268 {
269     return ! ( lhs == rhs );
270 }
271
272 } // end namespace gdcms
273
274 #endif //GDCMDATAELEMENT_H

```

## 11.129 gdcmDataSet.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmTag.h"
#include "gdcmVR.h"
#include "gdcmElement.h"
#include "gdcmMediaStorage.h"
#include <set>
#include <iterator>
#include "gdcmDataSet.txx"

```

Include dependency graph for gdcmDataSet.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::DataElementException](#)
- class [gdcm::DataSet](#)

*Class to represent a Data Set (which contains Data Elements)*

### Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const DataSet &val)`

## 11.130 gdcmDataSet.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDATASET_H
15 #define GDCMDATASET_H
16
17 #include "gdcmDataElement.h"
18 #include "gdcmTag.h"
19 #include "gdcmVR.h"
20 #include "gdcmElement.h"
21 #include "gdcmMediaStorage.h"
22
23 #include <set>
24 #include <iterator>
25
26 namespace gdcm_ns
27 {
28   class GDCM_EXPORT DataElementException : public std::exception {};
29
30   class PrivateTag;
31   class GDCM_EXPORT DataSet
32   {
33   friend class CSAHeader;
34   public:
35     typedef std::set<DataElement> DataSet;
36     typedef DataSet::const_iterator ConstIterator;
37     typedef DataSet::iterator Iterator;
38     typedef DataSet::size_type SizeType;
39     //typedef typename DataSet::iterator iterator;
40     ConstIterator Begin()const { return DES.begin(); }
41     Iterator Begin() { return DES.begin(); }
42     ConstIterator End()const { return DES.end(); }
43     Iterator End() { return DES.end(); }
44     const DataSet &GetDES()const { return DES; }
45     DataSet &GetDES() { return DES; }
46     void Clear() {
47       DES.clear();
48       assert( DES.empty() );
49     }
50
51     SizeType Size()const {
52       return DES.size();
53     }
54
55     void Print(std::ostream &os, std::string const &indent = "")const {
56       // CT_Phillips_JPEG2K-Decompr_Problem.dcm has a SQ of length == 0
57       //int s = DES.size();
58       //assert( s );
59       //std::copy(DES.begin(), DES.end(),
60       //  std::ostream_iterator<DataElement>(os, "\n"));
61       ConstIterator it = DES.begin();
62       for( ; it != DES.end(); ++it)
63       {
64         os << indent << *it << "\n";
65       }
66     }
67   }
68 }

```

```

92  template <typename TDE>
93  unsigned int ComputeGroupLength(Tag const &tag) const
94  {
95      assert( tag.GetElement() == 0x0 );
96      const DataElement r(tag);
97      ConstIterator it = DES.find(r);
98      unsigned int res = 0;
99      for( ++it; it != DES.end()
100          && it->GetTag().GetGroup() == tag.GetGroup(); ++it)
101      {
102          assert( it->GetTag().GetElement() != 0x0 );
103          assert( it->GetTag().GetGroup() == tag.GetGroup() );
104          res += it->GetLength<TDE>();
105      }
106      return res;
107  }
108
109  template <typename TDE>
110  VL GetLength() const {
111      if( DES.empty() ) return 0;
112      assert( !DES.empty() );
113      VL ll = 0;
114      assert( ll == 0 );
115      ConstIterator it = DES.begin();
116      for( ; it != DES.end(); ++it)
117      {
118          assert( !(it->GetLength<TDE>().IsUndefined()) );
119          if ( it->GetTag() != Tag(0xffff,0xe00d) )
120          {
121              ll += it->GetLength<TDE>();
122          }
123      }
124      return ll;
125  }
126
127  void Insert(const DataElement& de) {
128      // FIXME: there is a special case where a dataset can have value < 0x8, see:
129      // $ gdcmdump --csa gdcmdData/SIEMENS-JPEG-CorruptFrag.dcm
130      if( de.GetTag().GetGroup() >= 0x0008 || de.GetTag().GetGroup() == 0x4 )
131      {
132          // prevent user error:
133          if( de.GetTag() == Tag(0xffff,0xe00d)
134              || de.GetTag() == Tag(0xffff,0xe0dd)
135              || de.GetTag() == Tag(0xffff,0xe000) )
136          {
137              {
138              }
139              else
140              {
141                  InsertDataElement( de );
142              }
143          }
144          else
145          {
146              gdcmlErrorMacro( "Cannot add element with group < 0x0008 and != 0x4 in the dataset: " « de.GetTag() );
147          }
148      }
149
150      void Replace(const DataElement& de) {
151          ConstIterator it = DES.find(de);
152          if( it != DES.end() )
153          {
154              // detect loop:
155              gdcmlAssertAlwaysMacro( &*it != &de );
156              DES.erase(it);
157          }
158          DES.insert(de);
159      }
160
161      void ReplaceEmpty(const DataElement& de) {
162          ConstIterator it = DES.find(de);
163          if( it != DES.end() && it->IsEmpty() )
164          {
165              // detect loop:
166              gdcmlAssertAlwaysMacro( &*it != &de );
167              DES.erase(it);
168          }
169          DES.insert(de);
170      }
171
172      SizeType Remove(const Tag& tag) {
173          DataElementSet::size_type count = DES.erase(tag);
174          assert( count == 0 || count == 1 );
175          return count;
176      }
177

```



```

181 //DataElement& GetDataElement(const Tag &t) {
182 // DataElement r(t);
183 // Iterator it = DES.find(r);
184 // if( it != DES.end() )
185 //     return *it;
186 // return GetDEEnd();
187 // }
188 const DataElement& GetDataElement(const Tag &t) const {
189     const DataElement r(t);
190     ConstIterator it = DES.find(r);
191     if( it != DES.end() )
192         return *it;
193     return GetDEEnd();
194 }
195 const DataElement& operator[] (const Tag &t) const { return GetDataElement(t); }
196 const DataElement& operator() (uint16_t group, uint16_t element) const { return GetDataElement(
    Tag(group,element) ); }

197
200 std::string GetPrivateCreator(const Tag &t) const;
201
203 PrivateTag GetPrivateTag(const Tag &t) const;
204
206 bool FindDataElement(const PrivateTag &t) const;
208 const DataElement& GetDataElement(const PrivateTag &t) const;
209
210 // DUMB: this only search within the level of the current DataSet
211 bool FindDataElement(const Tag &t) const {
212     const DataElement r(t);
213     //ConstIterator it = DES.find(r);
214     if( DES.find(r) != DES.end() )
215     {
216         return true;
217     }
218     return false;
219 }
220
221 // WARNING:
222 // This only search at the same level as the DataSet is !
223 const DataElement& FindNextDataElement(const Tag &t) const {
224     const DataElement r(t);
225     ConstIterator it = DES.lower_bound(r);
226     if( it != DES.end() )
227         return *it;
228     return GetDEEnd();
229 }
230
232 bool IsEmpty() const { return DES.empty(); };
233
234 DataSet& operator=(DataSet const &)
235 = default;
236
237 template <typename TDE, typename TSwap>
238 std::istream &ReadNested(std::istream &is);
239
240 template <typename TDE, typename TSwap>
241 std::istream &Read(std::istream &is);
242
243 template <typename TDE, typename TSwap>
244 std::istream &ReadUpToTag(std::istream &is, const Tag &t, std::set<Tag> const &skiptags);
245
246 template <typename TDE, typename TSwap>
247 std::istream &ReadUpToTagWithLength(std::istream &is, const Tag &t, std::set<Tag> const &skiptags, VL &
    length);
248
249 template <typename TDE, typename TSwap>
250 std::istream &ReadSelectedTags(std::istream &is, const std::set<Tag> &tags, bool readvalues = true);
251 template <typename TDE, typename TSwap>
252 std::istream &ReadSelectedTagsWithLength(std::istream &is, const std::set<Tag> &tags, VL & length, bool
    readvalues = true);
253
254 template <typename TDE, typename TSwap>
255 std::istream &ReadSelectedPrivateTags(std::istream &is, const std::set<PrivateTag> &tags, bool readvalues
    = true);
256 template <typename TDE, typename TSwap>
257 std::istream &ReadSelectedPrivateTagsWithLength(std::istream &is, const std::set<PrivateTag> &tags, VL &
    length, bool readvalues = true);
258
259 template <typename TDE, typename TSwap>
260 std::ostream const &Write(std::ostream &os) const;
261
262 template <typename TDE, typename TSwap>

```

```

263     std::istream &ReadWithLength(std::istream &is, VL &length);
264
265     MediaStorage GetMediaStorage() const;
266
267 protected:
268     /* GetDEEnd is a Win32 only issue, one cannot use a dllexport
269     * static member data in an inline function, otherwise symbol
270     * will get reported as missing in any dll using the inlined function
271     */
272     const DataElement& GetDEEnd() const;
273
274     // This function is not safe, it does not check for the value of the tag
275     // so depending whether we are getting called from a dataset or file meta header
276     // the condition is different
277     void InsertDataElement(const DataElement& de) {
278         //if( de.GetTag() == Tag(0xfffe,0xe00d) ) return;
279         //if( de.GetTag() == Tag(0xfffe,0xe0dd) ) return;
280 #ifndef NDEBUG
281         std::pair<Iterator,bool> pr = DES.insert(de);
282         if( pr.second == false )
283         {
284             gdcmmWarningMacro( "DataElement:  " << de << " was already found, skipping duplicate entry.\n"
285             "Original entry kept is:  " << *pr.first );
286         }
287 #else
288         DES.insert(de);
289 #endif
290         assert( de.IsEmpty() || de.GetVL() == de.GetValue().GetLength() );
291     }
292
293 protected:
294     // Internal function, that will compute the actual Tag (if found) of
295     // a requested Private Tag (XXXX,YY,"PRIVATE")
296     Tag ComputeDataElement(const PrivateTag & t) const;
297
298 private:
299     DataElementSet DES;
300     static DataElement DEEnd;
301     friend std::ostream& operator<<(std::ostream &_os, const DataSet &);
302 };
303 //-----
304 inline std::ostream& operator<<(std::ostream &os, const DataSet &val)
305 {
306     val.Print(os);
307     return os;
308 }
309
310 #if defined(SWIGPYTHON) || defined(SWIGCSHARP) || defined(SWIGJAVA) || defined(SWIGPHP)
311 /*
312 * HACK: I need this temp class to be able to manipulate a std::set from python,
313 * swig does not support wrapping of simple class like std::set...
314 */
315 class SWIGDataSet
316 {
317 public:
318     SWIGDataSet(DataSet &des):Internal(des),it(des.Begin()) {}
319     const DataElement& GetCurrent()const { return *it; }
320     void Start() { it = Internal.Begin(); }
321     bool IsAtEnd()const { return it == Internal.End(); }
322     void Next() { ++it; }
323 private:
324     DataSet & Internal;
325     DataSet::ConstIterator it;
326 };
327 #endif /* SWIG */
328
329 } // end namespace gdcmm_ns
330
331 #include "gdcmmDataSet.txx"
332
333 #endif //GDCMDataSet_H

```

## 11.131 gdcmmDataSetEvent.h File Reference

```

#include "gdcmmEvent.h"
#include "gdcmmDataSet.h"

```

Include dependency graph for gdcmDataSetEvent.h:

## Classes

- class [gdcm::DataSetEvent](#)  
*DataSetEvent.*

## Namespaces

- namespace [gdcm](#)

## 11.132 gdcmDataSetEvent.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDATASETEVENT_H
15 #define GDCMDATASETEVENT_H
16
17 #include "gdcmEvent.h"
18 #include "gdcmDataSet.h"
19
20 namespace gdcm
21 {
22
23     class DataSetEvent : public AnyEvent
24     {
25     public:
26         typedef DataSetEvent Self;
27         typedef AnyEvent Superclass;
28         DataSetEvent(DataSet const *ds = nullptr):m_DataSet(ds) {}
29         ~DataSetEvent() override = default;
30         void operator=(const Self&) = delete;
31         const DataSet *m_DataSet;
32         const char * GetEventName()const override { return "DataSetEvent"; }
33         bool CheckEvent(const ::gdcm::Event* e)const override
34         { return (dynamic_cast<const Self*>(e) == nullptr ? false : true) ; }
35         ::gdcm::Event* MakeObject()const override
36         { return new Self; }
37         DataSetEvent(const Self&s) : AnyEvent(s){};
38
39         DataSet const & GetDataSet()const { return *m_DataSet; }
40     };
41
42 } // end namespace gdcm
43
44 #endif //GDCMANONYMIZEEVENT_H

```

## 11.133 gdcmElement.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmTag.h"
#include "gdcmVM.h"
#include "gdcmByteValue.h"
#include "gdcmDataElement.h"
#include "gdcmSwapper.h"
#include <string>
#include <vector>
#include <sstream>
#include <limits>
#include <cmath>
#include <cstring>
```

Include dependency graph for gdcmElement.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Element< TVR, TVM >](#)  
*Element class.*
- class [gdcm::Element< TVR, VM::VM1\\_2 >](#)
- class [gdcm::Element< TVR, VM::VM1\\_n >](#)
- class [gdcm::Element< TVR, VM::VM2\\_2n >](#)
- class [gdcm::Element< TVR, VM::VM2\\_n >](#)
- class [gdcm::Element< TVR, VM::VM3\\_3n >](#)
- class [gdcm::Element< TVR, VM::VM3\\_4 >](#)
- class [gdcm::Element< TVR, VM::VM3\\_n >](#)
- class [gdcm::Element< VR::AS, VM::VM5 >](#)
- class [gdcm::Element< VR::OB, VM::VM1 >](#)
- class [gdcm::Element< VR::OW, VM::VM1 >](#)
- class [gdcm::ElementDisableCombinations< TVR, TVM >](#)  
*A class which is used to produce compile errors for an invalid combination of template parameters.*
- class [gdcm::ElementDisableCombinations< VR::OB, VM::VM1\\_n >](#)
- class [gdcm::ElementDisableCombinations< VR::OW, VM::VM1\\_n >](#)
- class [gdcm::EncodingImplementation< VR::VRASCII >](#)
- class [gdcm::EncodingImplementation< VR::VRBINARY >](#)
- struct [gdcm::ignore\\_char](#)

### Namespaces

- namespace [gdcm](#)

## Functions

- static int [gdcm::add1](#) (char \*buf, int n)
- ignore\_char const [gdcm::backslash](#) ("\\")
- static void [gdcm::clean](#) (char \*mant)
- static int [gdcm::doround](#) (char \*buf, unsigned int n)
- std::istream & [gdcm::operator>>](#) (std::istream &in, ignore\_char const &ic)
- static int [gdcm::roundat](#) (char \*buf, size\_t bufLen, unsigned int i, int iexp)
- template<typename Float >  
static void [gdcm::x16printf](#) (char \*buf, int size, Float f)

## 11.134 gdcmElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMELEMENT_H
15 #define GDCMELEMENT_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmVR.h"
19 #include "gdcmTag.h"
20 #include "gdcmVM.h"
21 #include "gdcmByteValue.h"
22 #include "gdcmDataElement.h"
23 #include "gdcmSwapper.h"
24
25 #include <string>
26 #include <vector>
27 #include <sstream>
28 #include <limits>
29 #include <cmath>
30 #include <cstring>
31
32 namespace gdcm_ns
33 {
34
35 // Forward declaration
36 template<long long T> class EncodingImplementation;
37
38
39
40
41 template<long long TVR, int TVM>
42 class ElementDisableCombinations {};
43
44 template<>
45 class ElementDisableCombinations<VR::OB, VM::VM1_n> {};
46
47 template<>
48 class ElementDisableCombinations<VR::OW, VM::VM1_n> {};
49
50 // Make it impossible to compile these other cases
51 template<int TVM>
52 class ElementDisableCombinations<VR::OB, TVM>;
53
54 template<int TVM>
55 class ElementDisableCombinations<VR::OW, TVM>;
56
57 template<long long TVR, int TVM>
58 class Element
59 {
60     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, TVM> ) };
61     public:
62     typedef VRToType<TVR>::Type Internal[VMToLength<TVM>::Length];
63

```

```

74  typedef typename VRToType<TVR>::Type Type;
75
76  static VR  GetVR()  { return (VR::VRType)TVR; }
77  static VM  GetVM()  { return (VM::VMType)TVM; }
78
79  unsigned long GetLength()const {
80      return VMTToLength<TVM>::Length;
81  }
82  // Implementation of Print is common to all Mode (ASCII/Binary)
83  // TODO: Can we print a \ when in ASCII...well I don't think so
84  // it would mean we used a bad VM then, right?
85  void Print(std::ostream &_os)const {
86      _os << Internal[0]; // VM is at least guarantee to be one
87      for(int i=1; i<VMTToLength<TVM>::Length; ++i)
88          _os << ", " << Internal[i];
89  }
90
91  const typename VRToType<TVR>::Type *GetValues()const {
92      return Internal;
93  }
94  const typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0)const {
95      assert( idx < VMTToLength<TVM>::Length );
96      return Internal[idx];
97  }
98  typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) {
99      assert( idx < VMTToLength<TVM>::Length );
100     return Internal[idx];
101 }
102 typename VRToType<TVR>::Type operator[] (unsigned int idx)const {
103     return GetValue(idx);
104 }
105 void SetValue(typename VRToType<TVR>::Type v, unsigned int idx = 0) {
106     assert( idx < VMTToLength<TVM>::Length );
107     Internal[idx] = v;
108 }
109
110 void SetFromDataElement(DataElement const &de) {
111     const ByteValue *bv = de.GetByteValue();
112     if( !bv ) return;
113 #ifdef GDCM_WORDS_BIGENDIAN
114     if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
115 #else
116     if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
117 #endif
118     {
119         Set(de.GetValue());
120     }
121     else
122     {
123         SetNoSwap(de.GetValue());
124     }
125 }
126
127 DataElement GetAsDataElement()const {
128     DataElement ret;
129     std::ostringstream os;
130     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
131         GetLength(),os);
132     ret.SetVR( (VR::VRType)TVR );
133     assert( ret.GetVR() != VR::SQ );
134     if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
135     {
136         if( GetVR() != VR::UI )
137         {
138             if( os.str().size() % 2 )
139             {
140                 os << " ";
141             }
142         }
143     }
144     VL::Type osStrSize = (VL::Type)os.str().size();
145     ret.SetByteValue( os.str().c_str(), osStrSize );
146
147     return ret;
148 }
149
150 void Read(std::istream &_is) {
151     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
152         GetLength(),_is);
153 }
154 void Write(std::ostream &_os)const {

```

```

155     return EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
156         GetLength(),_os);
157 }
158
159 // FIXME: remove this function
160 // this is only used in gdcm::SplitMosaicFilter / to pass value of a CSAElement
161 void Set(Value const &v) {
162     const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
163     if( bv ) {
164         //memcpy(Internal, bv->GetPointer(), bv->GetLength());
165         std::stringstream ss;
166         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
167         ss.str( s );
168         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
169             GetLength(),ss);
170     }
171 }
172 protected:
173 void SetNoSwap(Value const &v) {
174     const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
175     assert( bv ); // That would be bad...
176     //memcpy(Internal, bv->GetPointer(), bv->GetLength());
177     std::stringstream ss;
178     std::string s = std::string( bv->GetPointer(), bv->GetLength() );
179     ss.str( s );
180     EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(Internal,
181         GetLength(),ss);
182 }
183 };
184
185 struct ignore_char {
186     ignore_char(char c): m_char(c) {}
187     char m_char;
188 };
189 ignore_char const backslash('\\');
190
191 inline std::istream& operator> (std::istream& in, ignore_char const& ic) {
192     if (!in.eof())
193         in.clear(in.rdstate() & ~std::ios_base::failbit);
194     if (in.get() != ic.m_char)
195         in.setstate(std::ios_base::failbit);
196     return in;
197 }
198
199
200 // Implementation to perform formatted read and write
201 template<> class EncodingImplementation<VR::VRASCII> {
202 public:
203     template<typename T> // FIXME this should be VRToType<TVR>::Type
204     static inline void ReadComputeLength(T* data, unsigned int &length,
205         std::istream &_is) {
206         assert( data );
207         //assert( length ); // != 0
208         length = 0;
209         assert( _is );
210         #if 0
211         char sep;
212         while( _is >> data[length++] )
213         {
214             // Get the separator in between the values
215             assert( _is );
216             _is.get(sep);
217             assert( sep == '\\\\' || sep == ' ' ); // FIXME: Bad use of assert
218             if( sep == ' ' ) length--; // FIXME
219         }
220         #else
221         while( _is >> std::ws >> data[length++] >> std::ws >> backslash )
222         {
223         }
224         #endif
225     }
226
227     template<typename T> // FIXME this should be VRToType<TVR>::Type
228     static inline void Read(T* data, unsigned long length,
229         std::istream &_is) {
230         assert( data );
231         assert( length ); // != 0
232         assert( _is );
233         // FIXME BUG: what if >> operation fails ?
234         // gdcmData/MR00010001.dcm / SpacingBetweenSlices
235         _is >> std::ws >> data[0];

```

```

236     char sep;
237     //std::cout << "GetLength: " << af->GetLength() << std::endl;
238     for(unsigned long i=1; i<length;++i) {
239         //assert( _is );
240         // Get the separator in between the values
241         _is >> std::ws >> sep; // _is.get(sep);
242         //assert( sep == '\\ ' ); // FIXME: Bad use of assert
243         _is >> std::ws >> data[i];
244     }
245 }
246
247 template<typename T>
248 static inline void ReadNoSwap(T* data, unsigned long length,
249                               std::istream &_is) {
250     Read(data,length,_is);
251 }
252
253 template<typename T>
254 static inline void Write(const T* data, unsigned long length,
255                          std::ostream &_os) {
256     assert( data );
257     assert( length );
258     assert( _os );
259     _os << data[0];
260     for(unsigned long i=1; i<length; ++i) {
261         assert( _os );
262         _os << "\\ " << data[i];
263     }
264 };
265
266 // #define VRDS16ILLEGAL
267
268 #ifdef VRDS16ILLEGAL
269 template < typename Float >
270 std::string to_string ( Float data ) {
271     std::stringstream in;
272     // in.imbue(std::locale::classic()); // This is not required AFAIK
273     int const digits =
274         static_cast< int >(
275             - std::log( std::numeric_limits<Float>::epsilon() )
276             / static_cast< Float >( std::log( 10.0 ) ) );
277     if ( in << std::dec << std::setprecision(*2*/digits) << data ) {
278         return ( in.str() );
279     } else {
280         throw "Impossible Conversion"; // should not happen ...
281     }
282 }
283 #else
284 //
285     http://stackoverflow.com/questions/32631178/writing-ieee-754-1985-double-as-ascii-on-a-limited-16-bytes-string
286 static inline void clean(char *mant) {
287     char *ix = mant + strlen(mant) - 1;
288     while(('0' == *ix) && (ix > mant)) {
289         *ix-- = '\0';
290     }
291     if ( '.' == *ix ) {
292         *ix = '\0';
293     }
294 }
295
296 static int add1(char *buf, int n) {
297     if (n < 0) return 1;
298     if (buf[n] == '9') {
299         buf[n] = '0';
300         return add1(buf, n-1);
301     }
302     else {
303         buf[n] = (char)(buf[n] + 1);
304     }
305     return 0;
306 }
307
308 static int doround(char *buf, unsigned int n) {
309     char c;
310     if (n >= strlen(buf)) return 0;
311     c = buf[n];
312     buf[n] = 0;
313     if ((c >= '5') && (c <= '9')) return add1(buf, n-1);
314     return 0;
315 }

```



```

316
317 #if defined(_MSC_VER) && (_MSC_VER < 1900)
318 #define snprintf _snprintf
319 #endif
320
321 static int roundat(char *buf, size_t bufLen, unsigned int i, int iexp) {
322     if (doround(buf, i) != 0) {
323         iexp += 1;
324         switch(iexp) {
325             case -2:
326                 strcpy(buf, ".01");
327                 break;
328             case -1:
329                 strcpy(buf, ".1");
330                 break;
331             case 0:
332                 strcpy(buf, "1.");
333                 break;
334             case 1:
335                 strcpy(buf, "10");
336                 break;
337             case 2:
338                 strcpy(buf, "100");
339                 break;
340             default:
341                 snprintf(buf, bufLen, "1e%d", iexp);
342             }
343         return 1;
344     }
345     return 0;
346 }
347
348 template < typename Float >
349 static void xl6printf(char *buf, int size, Float f) {
350     char line[40];
351     char *mant = line + 1;
352     int iexp, lexp, i;
353     char exp[6];
354
355     if (f < 0) {
356         f = -f;
357         size -= 1;
358         *buf++ = '-';
359     }
360     snprintf(line, sizeof(line), "%1.16e", f);
361     if (line[0] == '-') {
362         f = -f;
363         size -= 1;
364         *buf++ = '-';
365         snprintf(line, sizeof(line), "%1.16e", f);
366     }
367     *mant = line[0];
368     i = (int)strcspn(mant, "eE");
369     mant[i] = '\0';
370     iexp = (int)strtol(mant + i + 1, nullptr, 10);
371     lexp = snprintf(exp, sizeof(exp), "e%d", iexp);
372     if ((iexp >= size) || (iexp < -3)) {
373         i = roundat(mant, sizeof(line) - 1, size - 1 - lexp, iexp);
374         if (i == 1) {
375             strcpy(buf, mant);
376             return;
377         }
378         buf[0] = mant[0];
379         buf[1] = '.';
380         strncpy(buf + i + 2, mant + 1, size - 2 - lexp);
381         buf[size - lexp] = 0;
382         clean(buf);
383         strcat(buf, exp);
384     }
385     else if (iexp >= size - 2) {
386         roundat(mant, sizeof(line) - 1, iexp + 1, iexp);
387         strcpy(buf, mant);
388     }
389     else if (iexp >= 0) {
390         i = roundat(mant, sizeof(line) - 1, size - 1, iexp);
391         if (i == 1) {
392             strcpy(buf, mant);
393             return;
394         }
395         strncpy(buf, mant, iexp + 1);
396         buf[iexp + 1] = '.';

```

```

397     strncpy(buf + iexp + 2, mant + iexp + 1, size - iexp - 1);
398     buf[size] = 0;
399     clean(buf);
400 }
401 else {
402     int j;
403     i = roundat(mant, sizeof(line) - 1, size + 1 + iexp, iexp);
404     if (i == 1) {
405         strcpy(buf, mant);
406         return;
407     }
408     buf[0] = '.';
409     for(j=0; j< -1 - iexp; j++) {
410         buf[j+1] = '0';
411     }
412     strncpy(buf - iexp, mant, size + 1 + iexp);
413     buf[size] = 0;
414     clean(buf);
415 }
416 }
417 #if defined(_MSC_VER) && (_MSC_VER < 1900)
418 #undef snprintf
419 #endif
420
421 #endif
422
423 template<> inline void EncodingImplementation<VR::VRASCII>::Write(const double* data, unsigned long length,
    std::ostream &_os) {
424     assert( data );
425     assert( length );
426     assert( _os );
427 #ifdef VRDS16ILLEGAL
428     _os << to_string(data[0]);
429 #else
430     char buf[16+1];
431     x16printf(buf, 16, data[0]);
432     _os << buf;
433 #endif
434     for(unsigned long i=1; i<length; ++i) {
435         assert( _os );
436 #ifdef VRDS16ILLEGAL
437         _os << "\\\" << to_string(data[i]);
438 #else
439         x16printf(buf, 16, data[i]);
440         _os << "\\\" << buf;
441 #endif
442     }
443 }
444
445
446 // Implementation to perform binary read and write
447 // TODO rewrite operation so that either:
448 // #1. dummy implementation use a pointer to Internal and do ++p (faster)
449 // #2. Actually do some meta programming to unroll the loop
450 // (no notion of order in VM ...)
451 template<> class EncodingImplementation<VR::VRBINARY> {
452 public:
453     template<typename T> // FIXME this should be VRToType<TVR>::Type
454     static inline void ReadComputeLength(T* data, unsigned int &length,
455         std::istream &_is) {
456         const unsigned int type_size = sizeof(T);
457         assert( data ); // Can we read from pointer ?
458         //assert( length );
459         length /= type_size;
460         assert( _is ); // Is stream valid ?
461         _is.read( reinterpret_cast<char*>(data+0), type_size);
462         for(unsigned long i=1; i<length; ++i) {
463             assert( _is );
464             _is.read( reinterpret_cast<char*>(data+i), type_size );
465         }
466     }
467     template<typename T>
468     static inline void ReadNoSwap(T* data, unsigned long length,
469         std::istream &_is) {
470         const unsigned int type_size = sizeof(T);
471         assert( data ); // Can we read from pointer ?
472         assert( length );
473         assert( _is ); // Is stream valid ?
474         _is.read( reinterpret_cast<char*>(data+0), type_size);
475         for(unsigned long i=1; i<length; ++i) {
476             assert( _is );

```

```

477     _is.read( reinterpret_cast<char*>(data+i), type_size );
478 }
479 //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem(data,
480 // _is.GetSwapCode(), length);
481 //SwapperNoOp::SwapArray(data,length);
482 }
483 template<typename T>
484 static inline void Read(T* data, unsigned long length,
485     std::istream &_is) {
486     const unsigned int type_size = sizeof(T);
487     assert( data ); // Can we read from pointer ?
488     assert( length );
489     assert( !_is ); // Is stream valid ?
490     _is.read( reinterpret_cast<char*>(data+0), type_size);
491     for(unsigned long i=1; i<length; ++i) {
492         assert( !_is );
493         _is.read( reinterpret_cast<char*>(data+i), type_size );
494     }
495     //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem(data,
496     // _is.GetSwapCode(), length);
497     SwapperNoOp::SwapArray(data,length);
498 }
499 template<typename T>
500 static inline void Write(const T* data, unsigned long length,
501     std::ostream &_os) {
502     const unsigned int type_size = sizeof(T);
503     assert( data ); // Can we write into pointer ?
504     assert( length );
505     assert( !_os ); // Is stream valid ?
506     //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem((T*)data,
507     // _os.GetSwapCode(), length);
508     T swappedData = SwapperNoOp::Swap(data[0]);
509     _os.write( reinterpret_cast<const char*>(&swappedData), type_size);
510     for(unsigned long i=1; i<length;++i) {
511         assert( !_os );
512         swappedData = SwapperNoOp::Swap(data[i]);
513         _os.write( reinterpret_cast<const char*>(&swappedData), type_size );
514     }
515     //ByteSwap<T>::SwapRangeFromSwapCodeIntoSystem((T*)data,
516     // _os.GetSwapCode(), length);
517 }
518 };
519
520 // For particular case for ASCII string
521 // WARNING: This template explicitly instantiates a particular
522 // EncodingImplementation THEREFORE it is required to be declared after the
523 // EncodingImplementation is needs (doh!)
524 #if 0
525 template<int TVM>
526 class Element<TVM>
527 {
528 public:
529     Element(const char array[])
530     {
531         unsigned int i = 0;
532         const char sep = '\\';
533         std::string sarray = array;
534         std::string::size_type pos1 = 0;
535         std::string::size_type pos2 = sarray.find(sep, pos1+1);
536         while(pos2 != std::string::npos)
537         {
538             Internal[i++] = sarray.substr(pos1, pos2-pos1);
539             pos1 = pos2+1;
540             pos2 = sarray.find(sep, pos1+1);
541         }
542         Internal[i] = sarray.substr(pos1, pos2-pos1);
543         // Shouldn't we do the contrary, since we know how many separators
544         // (and default behavior is to discard anything after the VM declared
545         assert( GetLength()-1 == i );
546     }
547
548     unsigned long GetLength()const {
549         return VMTToLength<TVM>::Length;
550     }
551     // Implementation of Print is common to all Mode (ASCII/Binary)
552     void Print(std::ostream &_os)const {
553         _os << Internal[0]; // VM is at least guarantee to be one
554         for(int i=1; i<VMTToLength<TVM>::Length; ++i)
555             _os << ", " << Internal[i];
556     }
557

```

```

558 void Read(std::istream &_is) {
559     EncodingImplementation<VR::VRASCII>::Read(Internal, GetLength(), _is);
560 }
561 void Write(std::ostream &_os) const {
562     EncodingImplementation<VR::VRASCII>::Write(Internal, GetLength(), _os);
563 }
564 private:
565     typename String Internal[VMToLength<TVM>::Length];
566 };
567
568 template< int TVM>
569 class Element<VR::PN, TVM> : public StringElement<TVM>
570 {
571     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<VR::PN, TVM> ) };
572 };
573 #endif
574
575 // Implementation for the undefined length (dynamically allocated array)
576 template<long long TVR>
577 class Element<TVR, VM::VM1_n>
578 {
579     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM1_n> ) };
580 public:
581     // This the way to prevent default initialization
582     explicit Element() { Internal=nullptr; Length=0; Save = false; }
583     ~Element() {
584         if( Save ) {
585             delete[] Internal;
586         }
587         Internal = nullptr;
588     }
589
590     static VR GetVR() { return (VR::VRType)TVR; }
591     static VM GetVM() { return VM::VM1_n; }
592
593     // Length manipulation
594     // SetLength should really be protected anyway...all operation
595     // should go through SetArray
596     unsigned long GetLength()const { return Length; }
597     typedef typename VRToType<TVR>::Type Type;
598
599     void SetLength(unsigned long len) {
600         const unsigned int size = sizeof(Type);
601         if( len ) {
602             if( len > Length ) {
603                 // perform realloc
604                 assert( (len / size) * size == len );
605                 Type *internal = new Type[len / size];
606                 assert( Save == false );
607                 Save = true; // ???
608                 if( Internal )
609                 {
610                     memcpy(internal, Internal, len);
611                     delete[] Internal;
612                 }
613                 Internal = internal;
614             }
615         }
616         Length = len / size;
617     }
618
619     // If save is set to zero user should not delete the pointer
620     //void SetArray(const typename VRToType<TVR>::Type *array, int len, bool save = false)
621     void SetArray(const Type *array, unsigned long len,
622         bool save = false) {
623         if( save ) {
624             SetLength(len); // realloc
625             memcpy(Internal, array, len/*sizeof(Type)*/);
626             assert( Save == false );
627         }
628         else {
629             // TODO rewrite this stupid code:
630             assert( Length == 0 );
631             assert( Internal == nullptr );
632             assert( Save == false );
633             Length = len / sizeof(Type);
634             //assert( (len / sizeof(Type)) * sizeof(Type) == len );
635             // MR00010001.dcm is a tough kid: 0019,105a is supposed to be VR::FL, VM::VM3 but
636             // length is 14 bytes instead of 12 bytes. Simply consider value is total garbage.
637             if( (len / sizeof(Type)) * sizeof(Type) != len ) { Internal = nullptr; Length = 0; }
638             else Internal = const_cast<Type*>(array);

```

```

639     }
640     Save = save;
641 }
642 void SetValue(typename VRToType<TVR>::Type v, unsigned int idx = 0) {
643     assert( idx < Length );
644     Internal[idx] = v;
645 }
646 const typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) const {
647     assert( idx < Length );
648     return Internal[idx];
649 }
650 typename VRToType<TVR>::Type &GetValue(unsigned int idx = 0) {
651     //assert( idx < Length );
652     return Internal[idx];
653 }
654 typename VRToType<TVR>::Type operator[] (unsigned int idx) const {
655     return GetValue(idx);
656 }
657 void Set(Value const &v) {
658     const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
659     assert( bv ); // That would be bad...
660     if( (VR::VRType) (VRToEncoding<TVR>::Mode) == VR::VRBINARY )
661     {
662         const Type* array = (const Type*)bv->GetVoidPointer();
663         if( array ) {
664             assert( array ); // That would be bad...
665             assert( Internal == nullptr );
666             SetArray(array, bv->GetLength() ); }
667     }
668     else
669     {
670         std::stringstream ss;
671         std::string s = std::string( bv->GetPointer(), bv->GetLength() );
672         ss.str( s );
673         EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
674             GetLength(),ss);
675     }
676 }
677 void SetFromDataElement(DataElement const &de) {
678     const ByteValue *bv = de.GetByteValue();
679     if( !bv ) return;
680 #ifdef GDCM_WORDS_BIGENDIAN
681     if( de.GetVR() == VR::UN /*|| de.GetVR() == VR::INVALID*/ )
682     #else
683     if( de.GetVR() == VR::UN || de.GetVR() == VR::INVALID )
684     #endif
685     {
686         Set(de.GetValue());
687     }
688     else
689     {
690         SetNoSwap(de.GetValue());
691     }
692 }
693
694
695 // Need to be placed after definition of EncodingImplementation<VR::VRASCII>
696 void WriteASCII(std::ostream &os) const {
697     return EncodingImplementation<VR::VRASCII>::Write(Internal, GetLength(), os);
698 }
699
700 // Implementation of Print is common to all Mode (ASCII/Binary)
701 void Print(std::ostream &_os) const {
702     assert( Length );
703     assert( Internal );
704     _os << Internal[0]; // VM is at least guarantee to be one
705     const unsigned long length = GetLength() < 25 ? GetLength() : 25;
706     for(unsigned long i=1; i<length; ++i)
707         _os << ", " << Internal[i];
708 }
709 void Read(std::istream &_is) {
710     if( !Internal ) return;
711     EncodingImplementation<VRToEncoding<TVR>::Mode>::Read(Internal,
712         GetLength(),_is);
713 }
714 //void ReadComputeLength(std::istream &_is) {
715 //    if( !Internal ) return;
716 //    EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadComputeLength(Internal,
717 //        Length,_is);
718 // }
719 void Write(std::ostream &_os) const {

```

```

720     EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
721         GetLength(),_os);
722     }
723
724     DataElement GetAsDataElement()const {
725         DataElement ret;
726         ret.SetVR( (VR::VRType)TVR );
727         assert( ret.GetVR() != VR::SQ );
728         if( Internal )
729         {
730             std::ostringstream os;
731             EncodingImplementation<VRToEncoding<TVR>::Mode>::Write(Internal,
732                 GetLength(),os);
733             if( (VR::VRType)VRToEncoding<TVR>::Mode == VR::VRASCII )
734             {
735                 if( GetVR() != VR::UI )
736                 {
737                     if( os.str().size() % 2 )
738                     {
739                         os << " ";
740                     }
741                 }
742             }
743             VL::Type osStrSize = (VL::Type)os.str().size();
744             ret.SetByteValue( os.str().c_str(), osStrSize );
745         }
746         return ret;
747     }
748
749     Element(const Element&_val) {
750         if( this != &_amp;_val ) {
751             *this = _val;
752         }
753     }
754
755     Element &operator=(const Element &_val) {
756         Length = 0; // SYITF
757         Internal = 0;
758         SetArray(_val.Internal, _val.Length, true);
759         return *this;
760     }
761 protected:
762     void SetNoSwap(Value const &v) {
763         const ByteValue *bv = dynamic_cast<const ByteValue*>(&v);
764         assert( bv ); // That would be bad...
765         if( (VR::VRType) (VRToEncoding<TVR>::Mode) == VR::VRBINARY )
766         {
767             const Type* array = (const Type*)bv->GetPointer();
768             if( array ) {
769                 assert( array ); // That would be bad...
770                 assert( Internal == nullptr );
771                 SetArray(array, bv->GetLength() ); }
772         }
773         else
774         {
775             std::stringstream ss;
776             std::string s = std::string( bv->GetPointer(), bv->GetLength() );
777             ss.str( s );
778             EncodingImplementation<VRToEncoding<TVR>::Mode>::ReadNoSwap(Internal,
779                 GetLength(),ss);
780         }
781     }
782
783 private:
784     typename VRToType<TVR>::Type *Internal;
785     unsigned long Length; // unsigned int ??
786     bool Save;
787 };
788
789 //template <int TVM = VM::VM1_n>
790 //class Element<VR::OB, TVM > : public Element<VR::OB, VM::VM1_n> {};
791
792 // Partial specialization for derivatives of 1-n : 2-n, 3-n ...
793 template<long long TVR>
794 class Element<TVR, VM::VM1_2> : public Element<TVR, VM::VM1_n>
795 {
796 public:
797     typedef Element<TVR, VM::VM1_n> Parent;
798     void SetLength(int len) {
799         if( len != 1 && len != 2 ) return;
800         Parent::SetLength(len);

```

```

801 }
802 };
803 template<long long TVR>
804 class Element<TVR, VM::VM2_n> : public Element<TVR, VM::VM1_n>
805 {
806     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM2_n> ) };
807 public:
808     typedef Element<TVR, VM::VM1_n> Parent;
809     void SetLength(int len) {
810         if( len <= 1 ) return;
811         Parent::SetLength(len);
812     }
813 };
814 template<long long TVR>
815 class Element<TVR, VM::VM2_2n> : public Element<TVR, VM::VM2_n>
816 {
817     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM2_2n> ) };
818 public:
819     typedef Element<TVR, VM::VM2_n> Parent;
820     void SetLength(int len) {
821         if( len % 2 ) return;
822         Parent::SetLength(len);
823     }
824 };
825 template<long long TVR>
826 class Element<TVR, VM::VM3_n> : public Element<TVR, VM::VM1_n>
827 {
828     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM3_n> ) };
829 public:
830     typedef Element<TVR, VM::VM1_n> Parent;
831     void SetLength(int len) {
832         if( len <= 2 ) return;
833         Parent::SetLength(len);
834     }
835 };
836 template<long long TVR>
837 class Element<TVR, VM::VM3_3n> : public Element<TVR, VM::VM3_n>
838 {
839     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<TVR, VM::VM3_3n> ) };
840 public:
841     typedef Element<TVR, VM::VM3_n> Parent;
842     void SetLength(int len) {
843         if( len % 3 ) return;
844         Parent::SetLength(len);
845     }
846 };
847 template<long long TVR>
848 class Element<TVR, VM::VM3_4> : public Element<TVR, VM::VM1_n>
849 {
850 public:
851     typedef Element<TVR, VM::VM1_n> Parent;
852     void SetLength(int len) {
853         if( len != 3 && len != 4 ) return;
854         Parent::SetLength(len);
855     }
856 };
857
858
859 //template<int T> struct VRToLength;
860 //template<> struct VRToLength<VR::AS>
861 //{ enum { Length = VM::VM1 }; }
862 //template<>
863 //class Element<VR::AS> : public Element<VR::AS, VRToLength<VR::AS>::Length >
864
865 // only 0010 1010 AS 1 Patient's Age
866 template<>
867 class Element<VR::AS, VM::VM5>
868 {
869     enum { ElementDisableCombinationsCheck = sizeof ( ElementDisableCombinations<VR::AS, VM::VM5> ) };
870 public:
871     char Internal[VMToLength<VM::VM5>::Length * sizeof( VRToType<VR::AS>::Type )];
872     void Print(std::ostream &_os) const {
873         _os << Internal;
874     }
875     unsigned long GetLength() const {
876         return VMToLength<VM::VM5>::Length;
877     }
878 };
879
880
881 template<>

```

```

882 class Element<VR::OB, VM::VM1> : public Element<VR::OB, VM::VM1_n> {};
883
884 // Same for OW:
885 template <>
886 class Element<VR::OW, VM::VM1> : public Element<VR::OW, VM::VM1_n> {};
887
888
889 } // namespace gdcms_ns
890
891 #endif //GDCMELEMENT_H

```

## 11.135 gdcmsExplicitDataElement.h File Reference

```

#include "gdcmsDataElement.h"
#include "gdcmsExplicitDataElement.hxx"

```

Include dependency graph for gdcmsExplicitDataElement.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcms::ExplicitDataElement](#)  
Class to read/write a [DataElement](#) as Explicit Data [Element](#).

### Namespaces

- namespace [gdcms](#)

## 11.136 gdcmsExplicitDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcms.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMEXPLICITDATAELEMENT_H
15 #define GDCMEXPLICITDATAELEMENT_H
16
17 #include "gdcmsDataElement.h"
18
19 namespace gdcms_ns
20 {
21     class GDCM_EXPORT ExplicitDataElement : public DataElement
22     {
23     public:
24         VL GetLength() const;
25
26         template <typename TSwap>
27         std::istream &Read(std::istream &is);
28     };
29
30
31
32

```



```

33  template <typename TSwap>
34  std::istream &ReadPreValue(std::istream &is);
35
36  template <typename TSwap>
37  std::istream &ReadValue(std::istream &is, bool readvalues = true);
38
39  template <typename TSwap>
40  std::istream &ReadWithLength(std::istream &is, VL & length);
41
42  template <typename TSwap>
43  const std::ostream &Write(std::ostream &os) const;
44 };
45
46 } // end namespace gdcm_ns
47
48 #include "gdcmExplicitDataElement.hxx"
49
50 #endif //GDCMEXPLICITIMPLICITDATAELEMENT_H

```

## 11.137 gdcmExplicitImplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmExplicitImplicitDataElement.hxx"

```

Include dependency graph for gdcmExplicitImplicitDataElement.h:

### Classes

- class [gdcm::ExplicitImplicitDataElement](#)  
Class to read/write a *DataElement* as *ExplicitImplicit Data Element*.

### Namespaces

- namespace [gdcm](#)

## 11.138 gdcmExplicitImplicitDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMEXPLICITIMPLICITDATAELEMENT_H
15 #define GDCMEXPLICITIMPLICITDATAELEMENT_H
16
17 #include "gdcmDataElement.h"
18
19 namespace gdcm
20 {
21 // Data Element (ExplicitImplicit)
22 class GDCM_EXPORT ExplicitImplicitDataElement : public DataElement

```

```

30 {
31 public:
32     VL GetLength() const;
33
34     template <typename TSwap>
35     std::istream &Read(std::istream &is);
36
37     template <typename TSwap>
38     std::istream &ReadPreValue(std::istream &is);
39
40     template <typename TSwap>
41     std::istream &ReadValue(std::istream &is, bool readvalues = true);
42
43     template <typename TSwap>
44     std::istream &ReadWithLength(std::istream &is, VL & length)
45     {
46         (void) length;
47         return Read<TSwap>(is);
48     }
49
50     // PURPOSELY do not provide an implementation for writing !
51     //template <typename TSwap>
52     //const std::ostream &Write(std::ostream &os) const;
53 };
54
55 } // end namespace gdcm
56
57 #include "gdcmExplicitImplicitDataElement.txx"
58
59 #endif //GDCMEXPLICITIMPLICITDATAELEMENT_H

```

## 11.139 gdcmFile.h File Reference

```

#include "gdcmObject.h"
#include "gdcmDataSet.h"
#include "gdcmFileMetaInformation.h"

```

Include dependency graph for gdcmFile.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::File](#)  
a DICOM File

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const File &val)

## 11.140 gdcmFile.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILE_H
15 #define GDCMFILE_H
16
17 #include "gdcmObject.h"
18 #include "gdcmDataSet.h"
19 #include "gdcmFileMetaInformation.h"
20
21 namespace gdcm_ns
22 {
23
24     class GDCM_EXPORT File : public Object
25     {
26     public:
27         File();
28         ~File() override;
29
30         friend std::ostream &operator<<(std::ostream &os, const File &val);
31
32         std::istream &Read(std::istream &is);
33
34         std::ostream &Write(std::ostream &os) const;
35
36         const FileMetaInformation &GetHeader()const { return Header; }
37
38         FileMetaInformation &GetHeader() { return Header; }
39
40         void SetHeader( const FileMetaInformation &fmi ) { Header = fmi; }
41
42         const DataSet &GetDataSet()const { return DS; }
43
44         DataSet &GetDataSet() { return DS; }
45
46         void SetDataSet( const DataSet &ds ) { DS = ds; }
47
48     private:
49         FileMetaInformation Header;
50         DataSet DS;
51     };
52
53     //-----
54     inline std::ostream& operator<<(std::ostream &os, const File &val)
55     {
56         os << val.GetHeader() << std::endl;
57         //os << val.GetDataSet() << std::endl; // FIXME
58         assert(0);
59         return os;
60     }
61
62 } // end namespace gdcm_ns
63
64 #endif //GDCMFILE_H

```

## 11.141 gdcmFileMetaInformation.h File Reference

```

#include "gdcmPreamble.h"
#include "gdcmDataSet.h"
#include "gdcmDataElement.h"

```

```
#include "gdcmMediaStorage.h"
#include "gdcmTransferSyntax.h"
#include "gdcmExplicitDataElement.h"
```

Include dependency graph for `gdcmFileMetaInformation.h`: This graph shows which files directly or indirectly include this file:

## Classes

- class `gdcm::FileMetaInformation`  
*Class to represent a [File](#) Meta Information.*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const FileMetaInformation &val)`

## 11.142 gdcmFileMetaInformation.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILEMETAINFORMATION_H
15 #define GDCMFILEMETAINFORMATION_H
16
17 #include "gdcmPreamble.h"
18 #include "gdcmDataSet.h"
19 #include "gdcmDataElement.h"
20 #include "gdcmMediaStorage.h"
21 #include "gdcmTransferSyntax.h"
22 #include "gdcmExplicitDataElement.h"
23
24 namespace gdcm_ns
25 {
26     class GDCM_EXPORT FileMetaInformation : public DataSet
27     {
28     public:
29         // FIXME: TransferSyntax::TS_END -> TransferSyntax::ImplicitDataElement
30         FileMetaInformation();
31         ~FileMetaInformation();
32
33         friend std::ostream &operator<<(std::ostream &_os, const FileMetaInformation &_val);
34
35         bool IsValid()const { return true; }
36
37         TransferSyntax::NegociatedType GetMetaInformationTS()const { return MetaInformationTS; }
38         void SetDataSetTransferSyntax(const TransferSyntax &ts);
39     };
40 }
```

```

53  const TransferSyntax &GetDataSetTransferSyntax()const { return DataSetTS; }
54  MediaStorage GetMediaStorage() const;
55  std::string GetMediaStorageAsString() const;
56
57  // FIXME: no virtual function means: duplicate code...
58  void Insert(const DataElement& de) {
59      if( de.GetTag().GetGroup() == 0x0002 )
60      {
61          InsertDataElement( de );
62      }
63      else
64      {
65          gdcmErrorMacro( "Cannot add element with group != 0x0002 in the file meta header: " << de );
66      }
67  }
68  void Replace(const DataElement& de) {
69      Remove(de.GetTag());
70      Insert(de);
71  }
72
73  std::istream &Read(std::istream &is);
74  std::istream &ReadCompat(std::istream &is);
75
76  std::ostream &Write(std::ostream &os) const;
77
78  void FillFromDataSet(DataSet const &ds);
79
80  const Preamble &GetPreamble()const { return P; }
81  Preamble &GetPreamble() { return P; }
82  void SetPreamble(const Preamble &p) { P = p; }
83
84  static void SetImplementationClassUID(const char * imp);
85  static void AppendImplementationClassUID(const char * imp);
86  static const char *GetImplementationClassUID();
87  static void SetImplementationVersionName(const char * version);
88  static const char *GetImplementationVersionName();
89  static void SetSourceApplicationEntityTitle(const char * title);
90  static const char *GetSourceApplicationEntityTitle();
91
92  FileMetaInformation(FileMetaInformation const &fmi):DataSet(fmi)
93  {
94      DataSetTS = fmi.DataSetTS;
95      MetaInformationTS = fmi.MetaInformationTS;
96      DataSetMS = fmi.DataSetMS;
97  }
98  FileMetaInformation& operator=(const FileMetaInformation& fmi)
99  {
100     DataSetTS = fmi.DataSetTS;
101     MetaInformationTS = fmi.MetaInformationTS;
102     DataSetMS = fmi.DataSetMS;
103     return *this;
104 }
105
106 VL GetFullLength()const {
107     return P.GetLength() + DataSet::GetLength<ExplicitDataElement>();
108 }
109
110 protected:
111 void ComputeDataSetTransferSyntax(); // FIXME
112
113 template <typename TSwap>
114 std::istream &ReadCompatInternal(std::istream &is);
115
116 void Default();
117 void ComputeDataSetMediaStorageSOPClass();
118
119 TransferSyntax DataSetTS;
120 TransferSyntax::NegociatedType MetaInformationTS;
121 MediaStorage::MSType DataSetMS;
122
123 protected:
124 static const char * GetFileMetaInformationVersion();
125 static const char * GetGDCMImplementationClassUID();
126 static const char * GetGDCMImplementationVersionName();
127 static const char * GetGDCMSourceApplicationEntityTitle();
128
129 private:
130 Preamble P;
131
132 //static stuff:
133 static const char GDCM_FILE_META_INFORMATION_VERSION[];

```

```

139 static const char GDCM_IMPLEMENTATION_CLASS_UID[];
140 static const char GDCM_IMPLEMENTATION_VERSION_NAME[];
141 static const char GDCM_SOURCE_APPLICATION_ENTITY_TITLE[];
142 static std::string ImplementationClassUID;
143 static std::string ImplementationVersionName;
144 static std::string SourceApplicationEntityTitle;
145 };
146 //-----
147 inline std::ostream& operator<<(std::ostream &os, const FileMetaInformation &val)
148 {
149     os << val.GetPreamble() << std::endl;
150     val.Print( os );
151     return os;
152 }
153
154 } // end namespace gdcms
155
156 #endif //GDCMFILEMETAINFORMATION_H

```

## 11.143 gdcmsFileSet.h File Reference

```

#include "gdcmsFile.h"
#include <vector>

```

Include dependency graph for gdcmsFileSet.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcms::FileSet](#)

### Namespaces

- namespace [gdcms](#)

### Functions

- [std::ostream & gdcms::operator<<](#) (std::ostream &os, const FileSet &f)

## 11.144 gdcmsFileSet.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcms.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILESET_H
15 #define GDCMFILESET_H
16

```

```

17 #include "gdcmFile.h"
18 #include <vector>
19
20 namespace gdcm
21 {
22     class GDCM_EXPORT FileSet
23     {
24     friend std::ostream& operator<<(std::ostream &_os, const FileSet &d);
25     public:
26         FileSet():Files() {}
27         typedef std::string FileType;
28         typedef std::vector<FileType> FileTypes;
29
30         void AddFile(File const & ) {}
31
32         bool AddFile(const char *filename);
33
34         void SetFiles(FileTypes const &files);
35         FileTypes const &GetFiles() const {
36             return Files;
37         }
38     private:
39         FileTypes Files;
40     };
41 //-----
42 inline std::ostream& operator<<(std::ostream &os, const FileSet &f)
43 {
44     (void)f; // FIXME
45     return os;
46 }
47 } // end namespace gdcm
48 #endif //GDCMFILESET_H

```

## 11.145 gdcmFragment.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
#include "gdcmParseException.h"

```

Include dependency graph for gdcmFragment.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Fragment](#)  
Class to represent a [Fragment](#).

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const Fragment &val)

## 11.146 gdcmFragment.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFRAGMENT_H
15 #define GDCMFRAGMENT_H
16
17 #include "gdcmDataElement.h"
18 #include "gdcmByteValue.h"
19 #include "gdcmSmartPointer.h"
20 #include "gdcmParseException.h"
21
22 namespace gdcm_ns
23 {
24
25 // Implementation detail:
26 // I think Fragment should be a protected subclass of DataElement:
27 // looking somewhat like this:
28 /*
29 class GDCM_EXPORT Fragment : protected DataElement
30 {
31 public:
32 using DataElement::GetTag;
33 using DataElement::GetVL;
34 using DataElement::SetByteValue;
35 using DataElement::GetByteValue;
36 using DataElement::GetValue;
37 */
38 // Instead I am only hiding the SetTag member...
39
40 class GDCM_EXPORT Fragment : public DataElement
41 {
42 //protected:
43 // void SetTag(const Tag &t);
44 public:
45 Fragment() : DataElement(Tag(0xffff, 0xe000), 0) {}
46 friend std::ostream &operator<<(std::ostream &os, const Fragment &val);
47
48 VL GetLength() const;
49
50 VL ComputeLength() const;
51
52 template <typename TSwap>
53 std::istream &Read(std::istream &is)
54 {
55     ReadPreValue<TSwap>(is);
56     return ReadValue<TSwap>(is);
57 }
58
59 template <typename TSwap>
60 std::istream &ReadPreValue(std::istream &is)
61 {
62     const Tag itemStart(0xffff, 0xe000);
63     const Tag seqDelItem(0xffff, 0xe0dd);
64
65     TagField.Read<TSwap>(is);
66     if( !is )
67     {
68         // BogusItemStartItemEnd.dcm
69         throw Exception( "Problem #1" );
70     }
71     if( !ValueLengthField.Read<TSwap>(is) )
72     {
73         // GENESIS_SIGNA-JPEG-CorruptFrag.dcm
74         // JPEG fragment is declared to have 61902, but in fact really is only 61901
75         // so we end up reading 0xddff, 0x00e0, and VL = 0x0 (1 byte)
76         throw Exception( "Problem #2" );
77     }
78 }
79

```



```

80     }
81 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
82     if( TagField != itemStart && TagField != seqDelItem )
83     {
84         throw Exception( "Problem #3" );
85     }
86 #endif
87     return is;
88 }
89
90 template <typename TSwap>
91 std::istream &ReadValue(std::istream &is)
92 {
93     // Superclass
94     const Tag itemStart(0xfffe, 0xe000);
95     const Tag seqDelItem(0xfffe, 0xe0dd);
96     // Self
97     SmartPointer<ByteValue> bv = new ByteValue;
98     bv->SetLength(ValueLengthField);
99     if( !bv->Read<TSwap>(is) )
100     {
101         // Fragment is incomplete, but is a itemStart, let's try to push it anyway...
102         gdcmWarningMacro( "Fragment could not be read" );
103         //bv->SetLength(is.gcount());
104         ValueField = bv;
105         ParseException pe;
106         pe.SetLastElement( *this );
107         throw pe;
108     }
109     ValueField = bv;
110     return is;
111 }
112
113 template <typename TSwap>
114 std::istream &ReadBacktrack(std::istream &is)
115 {
116     const Tag itemStart(0xfffe, 0xe000);
117     const Tag seqDelItem(0xfffe, 0xe0dd);
118
119     bool cont = true;
120     const std::streampos start = is.tellg();
121     const int max = 10;
122     int offset = 0;
123     while( cont )
124     {
125         TagField.Read<TSwap>(is);
126         assert( is );
127         if( TagField != itemStart && TagField != seqDelItem )
128         {
129             ++offset;
130             is.seekg( (std::streampos)((size_t)start - offset) );
131             gdcmWarningMacro( "Fuzzy Search, backtrack: " << (start - is.tellg()) << " Offset: " << is.tellg() );
132             if( offset > max )
133             {
134                 gdcmErrorMacro( "Giving up" );
135                 throw "Impossible to backtrack";
136             }
137         }
138         else
139         {
140             cont = false;
141         }
142     }
143     assert( TagField == itemStart || TagField == seqDelItem );
144     if( !ValueLengthField.Read<TSwap>(is) )
145     {
146         return is;
147     }
148
149     // Self
150     SmartPointer<ByteValue> bv = new ByteValue;
151     bv->SetLength(ValueLengthField);
152     if( !bv->Read<TSwap>(is) )
153     {
154         // Fragment is incomplete, but is a itemStart, let's try to push it anyway...
155         gdcmWarningMacro( "Fragment could not be read" );
156         //bv->SetLength(is.gcount());
157         ValueField = bv;
158         ParseException pe;
159         pe.SetLastElement( *this );
160         throw pe;

```

```

161     }
162     ValueField = bv;
163     return is;
164 }
165
166
167 template <typename TSwap>
168 std::ostream &Write(std::ostream &os) const {
169     const Tag itemStart(0xffff, 0x000);
170     const Tag seqDelItem(0xffff, 0x0dd);
171     if( !TagField.Write<TSwap>(os) )
172     {
173         assert(0 && "Should not happen");
174         return os;
175     }
176     assert( TagField == itemStart
177         || TagField == seqDelItem );
178     const ByteValue *bv = GetByteValue();
179     // VL
180     // The following piece of code is hard to read in order to support such broken file as:
181     // CompressedLossy.dcm
182     if( IsEmpty() )
183     {
184         //assert( bv );
185         VL zero = 0;
186         if( !zero.Write<TSwap>(os) )
187         {
188             assert(0 && "Should not happen");
189             return os;
190         }
191     }
192     else
193     {
194         assert( ValueLengthField );
195         assert( !ValueLengthField.IsUndefined() );
196         const VL actualLen = bv->ComputeLength();
197         assert( actualLen == ValueLengthField || actualLen == ValueLengthField + 1 );
198         if( !actualLen.Write<TSwap>(os) )
199         {
200             assert(0 && "Should not happen");
201             return os;
202         }
203     }
204     // Value
205     if( ValueLengthField && bv )
206     {
207         // Self
208         assert( bv );
209         assert( bv->GetLength() == ValueLengthField );
210         if( !bv->Write<TSwap>(os) )
211         {
212             assert(0 && "Should not happen");
213             return os;
214         }
215     }
216     return os;
217 }
218 };
219 //-----
220 inline std::ostream &operator<<(std::ostream &os, const Fragment &val)
221 {
222     os << "Tag: " << val.TagField;
223     os << "\tVL: " << val.ValueLengthField;
224     if( val.ValueField )
225     {
226         os << "\t" << *(val.ValueField);
227     }
228     return os;
229 }
230 }
231
232 } // end namespace gdcm_ns
233
234 #endif //GDCMFRAGMENT_H

```

## 11.147 gdcmImplicitDataElement.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmImplicitDataElement.txx"
Include dependency graph for gdcmImplicitDataElement.h:
```

### Classes

- class [gdcm::ImplicitDataElement](#)  
Class to represent an Implicit [VR](#) Data [Element](#).

### Namespaces

- namespace [gdcm](#)

## 11.148 gdcmImplicitDataElement.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMPLICITDATAELEMENT_H
15 #define GDCMIMPLICITDATAELEMENT_H
16
17 #include "gdcmDataElement.h"
18
19 namespace gdcm_ns
20 {
21
22
23
24
25
26 class GDCM_EXPORT ImplicitDataElement : public DataElement
27 {
28 public:
29     VL GetLength() const;
30
31     template <typename TSwap>
32     std::istream &Read(std::istream& is);
33
34     template <typename TSwap>
35     std::istream &ReadPreValue(std::istream& is);
36
37     template <typename TSwap>
38     std::istream &ReadValue(std::istream& is, bool readvalues = true);
39
40     template <typename TSwap>
41     std::istream &ReadWithLength(std::istream& is, VL & length, bool readvalues = true);
42
43     template <typename TSwap>
44     std::istream &ReadValueWithLength(std::istream& is, VL & length, bool readvalues = true);
45
46     template <typename TSwap>
47     const std::ostream &Write(std::ostream& os) const;
48 };
49
50 } // end namespace gdcm_ns
51
52 #include "gdcmImplicitDataElement.txx"
53
54 #endif //GDCMIMPLICITDATAELEMENT_H
```

## 11.149 gdcmItem.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmParseException.h"
#include "gdcmSwapper.h"
#include "gdcmItem.txx"
```

Include dependency graph for gdcmItem.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Item](#)  
*Class to represent an [Item](#).*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Item &val)`

## 11.150 gdcmItem.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMITEM_H
16 #define GDCMITEM_H
17
18 #include "gdcmDataElement.h"
19 #include "gdcmDataSet.h"
20 #include "gdcmParseException.h"
21 #include "gdcmSwapper.h"
22
23 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
24 #include "gdcmByteSwapFilter.h"
25 #endif
26
27 namespace gdcm_ns
28 {
29
30 class DataSet;
45 class GDCM_EXPORT Item : public DataElement
46 {
```

```

47 public:
48     Item() : DataElement(Tag(0xfffe, 0xe000), 0xFFFFFFFF), NestedDataSet() {}
49     friend std::ostream& operator<< (std::ostream &os, const Item &val);
50
51     void Clear() {
52         this->DataElement::Clear();
53         NestedDataSet.Clear();
54     }
55
56     template <typename TDE>
57     VL GetLength() const;
58
59     void InsertDataElement(const DataElement & de) {
60         NestedDataSet.Insert(de);
61         // Update the length
62         if( !IsUndefinedLength() )
63         {
64             assert( 0 && "InsertDataElement" );
65             //ValueLengthField += de.GetLength();
66         }
67     }
68     const DataElement& GetDataElement(const Tag& t)const
69 {
70     return NestedDataSet.GetDataElement(t);
71 }
72
73 // Completely defines it with the nested dataset
74 // destroy anything present
75 void SetNestedDataSet(const DataSet& nested)
76 {
77     NestedDataSet = nested;
78 }
79 // Return a const ref to the Nested Data Set
80 const DataSet &GetNestedDataSet()const
81 {
82     return NestedDataSet;
83 }
84 DataSet &GetNestedDataSet()
85 {
86     return NestedDataSet;
87 }
88
89 //Value const & GetValue() const { return *NestedDataSet; }
90
91 Item(Item const &val):DataElement(val)
92 {
93     NestedDataSet = val.NestedDataSet;
94 }
95
96 template <typename TDE, typename TSwap>
97 std::istream &Read(std::istream &is) {
98     // Superclass
99     {
100         DataSet &nested = NestedDataSet;
101         nested.Clear();
102         assert( nested.IsEmpty() );
103     }
104     if( !TagField.Read<TSwap>(is) )
105     {
106         throw Exception("Should not happen (item)");
107         return is;
108     }
109 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
110     // MR_Philips_Intera_SwitchIndianess_noLgtSQItem_in_trueLgtSeq.dcm
111     if( TagField == Tag(0xfeff, 0x00e0)
112         || TagField == Tag(0xfeff, 0xdde0) )
113     {
114         gdcmWarningMacro( "ByteSwapping Private SQ: " << TagField );
115         // Invert previously read TagField since wrong endianness:
116         TagField = Tag( SwapperDoOp::Swap( TagField.GetGroup() ), SwapperDoOp::Swap( TagField.GetElement() ) );
117     }
118     assert ( TagField == Tag(0xfffe, 0xe000)
119             || TagField == Tag(0xfffe, 0xe0dd) );
120     if( !ValueLengthField.Read<SwapperDoOp>(is) )
121     {
122         assert(0 && "Should not happen");
123         return is;
124     }
125     // Self
126     // Some file written by GDCM 1.0 we write 0xFFFFFFFF instead of 0x0

```

```

127     if( TagField == Tag(0xffff,0xe0dd) )
128     {
129         if( ValueLengthField )
130         {
131             gdcmErrorMacro( "ValueLengthField is not 0" );
132         }
133     }
134     //else if( ValueLengthField == 0 )
135     // {
136     //     //assert( TagField == Tag( 0xffff, 0xe0dd) );
137     //     if( TagField != Tag( 0xffff, 0xe0dd) )
138     //     {
139     //         gdcmErrorMacro( "SQ: " << TagField << " has a length of 0" );
140     //     }
141     // }
142     else if( ValueLengthField.IsUndefined() )
143     {
144         DataSet &nested = NestedDataSet;
145         nested.Clear();
146         assert( nested.IsEmpty() );
147         std::streampos start = is.tellg();
148         try
149         {
150             nested.template ReadNested<TDE,SwapperDoOp>(is);
151             ByteSwapFilter bsf(nested);
152             bsf.ByteSwap();
153         }
154         catch(ParseException &pe)
155         {
156             (void)pe;
157             // MR_Philips_Intera_PrivateSequenceExplicitVR_in_SQ_2001_e05f_item_wrong_lgt_use_NOSHADOWSEQ.dcm
158             // You have to byteswap the length but not the tag...sigh
159             gdcmWarningMacro( "Attempt to read nested Item without byteswapping the Value Length." );
160             start -= is.tellg();
161             assert( start < 0 );
162             is.seekg( start, std::ios::cur );
163             nested.Clear();
164             nested.template ReadNested<TDE,SwapperNoOp>(is);
165             ByteSwapFilter bsf(nested);
166             // Tag are read in big endian, need to byteswap them back...
167             bsf.SetByteSwapTag(true);
168             bsf.ByteSwap();
169         }
170         catch(Exception &e)
171         {
172             // MR_Philips_Intera_No_PrivateSequenceImplicitVR.dcm
173             throw e;
174         }
175         catch(...)
176         {
177             assert(0);
178         }
179     }
180     else /* if( ValueLengthField.IsUndefined() ) */
181     {
182         DataSet &nested = NestedDataSet;
183         nested.Clear();
184         assert( nested.IsEmpty() );
185         nested.template ReadWithLength<TDE,SwapperDoOp>(is, ValueLengthField);
186         ByteSwapFilter bsf(nested);
187         bsf.ByteSwap();
188     }
189     return is;
190 }
191 // http://groups.google.com/group/comp.protocols.dicom/msg/c07efcf5e759fc83
192 // Bug_Philips_ItemTag_3F3F.dcm
193 if( TagField == Tag(0x3f3f, 0x3f00) )
194 {
195     //TagField = Tag(0xffff, 0xe000);
196 }
197 #endif
198 if( TagField != Tag(0xffff, 0xe000) && TagField != Tag(0xffff, 0xe0dd) )
199 {
200     gdcmDebugMacro( "Invalid Item, found tag: " << TagField);
201     throw Exception( "Not a valid Item" );
202 }
203 assert( TagField == Tag(0xffff, 0xe000) || TagField == Tag(0xffff, 0xe0dd) );
204
205 if( !ValueLengthField.Read<TSwap>(is) )
206 {
207     assert(0 && "Should not happen");

```

```

208     return is;
209 }
210 // Self
211 if( TagField == Tag(0xfffe,0xe0dd) )
212 {
213     // Some file written by GDCM 1.0 were written with 0xFFFFFFFF instead of 0x0
214     if( ValueLengthField )
215     {
216         gdcmDebugMacro( "ValueLengthField is not 0 but " « ValueLengthField );
217     }
218 }
219 else if( ValueLengthField.IsUndefined() )
220 {
221     DataSet &nested = NestedDataSet;
222     nested.Clear();
223     assert( nested.IsEmpty() );
224     nested.template ReadNested<TDE,TSwap>(is);
225 }
226 else /* if( ValueLengthField.IsUndefined() ) */
227 {
228     assert( !ValueLengthField.IsUndefined() );
229     DataSet &nested = NestedDataSet;
230     nested.Clear();
231     assert( nested.IsEmpty() );
232     nested.template ReadWithLength<TDE,TSwap>(is, ValueLengthField);
233 }
234
235 return is;
236 }
237
238 template <typename TDE, typename TSwap>
239 const std::ostream &Write(std::ostream &os)const {
240 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
241     if( TagField == Tag(0x3f3f,0x3f00) && false )
242     {
243         Tag t(0xfffe, 0xe000);
244         t.Write<TSwap>(os);
245     }
246     else
247 #endif
248     {
249         assert ( TagField == Tag(0xfffe, 0xe000)
250             || TagField == Tag(0xfffe, 0xe0dd) );
251         // Not sure how this happen
252         if( TagField == Tag(0xfffe, 0xe0dd) )
253         {
254             gdcmWarningMacro( "SeqDelItem found in defined length Sequence" );
255             assert( ValueLengthField == 0 );
256             assert( NestedDataSet.Size() == 0 );
257         }
258         if( !TagField.Write<TSwap>(os) )
259         {
260             assert(0 && "Should not happen");
261             return os;
262         }
263     }
264     if( ValueLengthField.IsUndefined() )
265     {
266         if( !ValueLengthField.Write<TSwap>(os) )
267         {
268             assert(0 && "Should not happen");
269             return os;
270         }
271     }
272     else
273     {
274         const VL dummy = NestedDataSet.GetLength<TDE>();
275         assert( dummy % 2 == 0 );
276         //assert( ValueLengthField == dummy );
277         if( !dummy.Write<TSwap>(os) )
278         {
279             assert(0 && "Should not happen");
280             return os;
281         }
282     }
283     // Self
284     NestedDataSet.Write<TDE,TSwap>(os);
285     if( ValueLengthField.IsUndefined() )
286     {
287         const Tag itemDelItem(0xfffe,0xe00d);
288         itemDelItem.Write<TSwap>(os);

```

```

289     VL zero = 0;
290     zero.Write<TSwap>(os);
291 }
292
293     return os;
294 }
295
296 /*
297 There are three special SQ related Data Elements that are not ruled by the VR encoding rules conveyed
298 by the Transfer Syntax. They shall be encoded as Implicit VR. These special Data Elements are Item
299 (FFFE,E000), Item Delimitation Item (FFFE,E00D), and Sequence Delimitation Item (FFFE,E0DD).
300 However, the Data Set within the Value Field of the Data Element Item (FFFE,E000) shall be encoded
301 according to the rules conveyed by the Transfer Syntax.
302 */
303 bool FindDataElement(const Tag &t) const {
304     return NestedDataSet.FindDataElement( t );
305 }
306
307 private:
308     /* NESTED DATA SET a Data Set contained within a Data Element of an other Data Set.
309     * May be nested recursively.
310     * Only Data Elements with VR = SQ may, themselves, contain Data Sets
311     */
312     DataSet NestedDataSet;
313 };
314 //-----
315 inline std::ostream& operator<<(std::ostream& os, const Item &val)
316 {
317     os << val.TagField;
318     os << "\t" << val.ValueLengthField << "\n";
319     val.NestedDataSet.Print( os, "\t" );
320
321     return os;
322 }
323
324
325 } // end namespace gdcm_ns
326
327 #include "gdcmItem.txx"
328
329 #endif //GDCMITEM_H

```

## 11.151 gdcmLO.h File Reference

#include "gdcmString.h"  
 Include dependency graph for gdcmLO.h:

### Classes

- class [gdcm::LO](#)  
[LO](#).

### Namespaces

- namespace [gdcm](#)



## 11.152 gdcmLO.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMLO_H
15 #define GDCMLO_H
16
17 #include "gdcmString.h"
18
19 namespace gdcm
20 {
21
22 class /*GDCM_EXPORT*/ LO : public String<'\\',64> /* PLEASE do not export me */
23 {
24 public:
25     // typedef are not inherited:
26     typedef String<'\\',64> Superclass;
27     typedef Superclass::value_type      value_type;
28     typedef Superclass::pointer         pointer;
29     typedef Superclass::reference        reference;
30     typedef Superclass::const_reference const_reference;
31     typedef Superclass::size_type        size_type;
32     typedef Superclass::difference_type  difference_type;
33     typedef Superclass::iterator         iterator;
34     typedef Superclass::const_iterator   const_iterator;
35     typedef Superclass::reverse_iterator reverse_iterator;
36     typedef Superclass::const_reverse_iterator const_reverse_iterator;
37
38     // LO constructors.
39     LO(): Superclass() {}
40     LO(const value_type* s): Superclass(s) {}
41     LO(const value_type* s, size_type n): Superclass(s, n) {}
42     LO(const Superclass& s, size_type pos=0, size_type n=npow):
43         Superclass(s, pos, n) {}
44
45     bool IsValid()const {
46         if( !Superclass::IsValid() ) return false;
47         // Implementation specific:
48         return true;
49     }
50 };
51
52 } // end namespace gdcm
53
54 #endif //GDCMLO_H

```

## 11.153 gdcmMediaStorage.h File Reference

```
#include "gdcmTransferSyntax.h"
```

Include dependency graph for gdcmMediaStorage.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::MediaStorage](#)  
*MediaStorage.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const MediaStorage &ms)`

## 11.154 gdcmMediaStorage.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMEDIASTORAGE_H
15 #define GDCMMEDIASTORAGE_H
16
17 #include "gdcmTransferSyntax.h"
18
19 namespace gdcm { class Tag; }
20 namespace gdcm_ns
21 {
22 #if !defined(SWIGPYTHON) && !defined(SWIGSHARP) && !defined(SWIGJAVA) && !defined(SWIGPHP)
23 using namespace gdcm;
24 #endif
25 class DataSet;
26 class FileMetaInformation;
27 class File;
28
29 // WARNING: This class will be deprecated in the future. There is no reason to extend this class.
30 // Please check the gdcm::UIDs class if adding new well known UID.
31
32 class GDCM_EXPORT MediaStorage
33 {
34 public:
35     typedef enum {
36         MediaStorageDirectoryStorage = 0,
37         ComputedRadiographyImageStorage,
38         DigitalXRayImageStorageForPresentation,
39         DigitalXRayImageStorageForProcessing,
40         DigitalMammographyImageStorageForPresentation,
41         DigitalMammographyImageStorageForProcessing,
42         DigitalIntraoralXRayImageStorageForPresentation,
43         DigitalIntraoralXRayImageStorageForProcessing,
44         CTImageStorage,
45         EnhancedCTImageStorage,
46         UltrasoundImageStorageRetired,
47         UltrasoundImageStorage,
48         UltrasoundMultiFrameImageStorageRetired,
49         UltrasoundMultiFrameImageStorage,
50         MRImageStorage,
51         EnhancedMRImageStorage,
52         MRSpectroscopyStorage,
53         NuclearMedicineImageStorageRetired,
54         SecondaryCaptureImageStorage,
55         MultiframeSingleBitSecondaryCaptureImageStorage,
56         MultiframeGrayscaleByteSecondaryCaptureImageStorage,
57         MultiframeGrayscaleWordSecondaryCaptureImageStorage,
58         MultiframeTrueColorSecondaryCaptureImageStorage,
59         StandaloneOverlayStorage,

```

```

71     StandaloneCurveStorage,
72     LeadECGWaveformStorage, // 12-
73     GeneralECGWaveformStorage,
74     AmbulatoryECGWaveformStorage,
75     HemodynamicWaveformStorage,
76     CardiacElectrophysiologyWaveformStorage,
77     BasicVoiceAudioWaveformStorage,
78     StandaloneModalityLUTStorage,
79     StandaloneVOILUTStorage,
80     GrayscaleSoftcopyPresentationStateStorageSOPClass,
81     XRayAngiographicImageStorage,
82     XRayRadiofluoroscopicImageStorage,
83     XRayAngiographicBiPlaneImageStorageRetired,
84     NuclearMedicineImageStorage,
85     RawDataStorage,
86     SpacialRegistrationStorage, // Spatial
87     SpacialFiducialsStorage, // Spatial..
88     PETImageStorage,
89     RTImageStorage,
90     RTDoseStorage,
91     RTStructureSetStorage,
92     RTPlanStorage,
93     CSANonImageStorage,
94     Philips3D,
95     EnhancedSR,
96     BasicTextSR,
97     HardcopyGrayscaleImageStorage,
98     ComprehensiveSR,
99     DetachedStudyManagementSOPClass,
100     EncapsulatedPDFStorage,
101     EncapsulatedCDASStorage,
102     StudyComponentManagementSOPClass,
103     DetachedVisitManagementSOPClass,
104     DetachedPatientManagementSOPClass,
105     VideoEndoscopicImageStorage,
106     GeneralElectricMagneticResonanceImageStorage,
107     GEPrivate3DModelStorage,
108     ToshibaPrivateDataStorage,
109     MammographyCADSR,
110     KeyObjectSelectionDocument,
111     HangingProtocolStorage,
112     ModalityPerformedProcedureStepSOPClass,
113     PhilipsPrivateMRSyntheticImageStorage,
114     VLPPhotographicImageStorage,
115     SegmentationStorage, // "1.2.840.10008.5.1.4.1.1.66.4"
116     RTIonPlanStorage, // 1.2.840.10008.5.1.4.1.1.481.8
117     XRay3DAngiographicImageStorage, // 1.2.840.10008.5.1.4.1.1.13.1.1
118     EnhancedXAImageStorage,
119     RTIonBeamsTreatmentRecordStorage, // 1.2.840.10008.5.1.4.1.1.481.9
120     SurfaceSegmentationStorage, // "1.2.840.10008.5.1.4.1.1.66.5"
121     VLWholeSlideMicroscopyImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.6
122     RTTreatmentSummaryRecordStorage, // 1.2.840.10008.5.1.4.1.1.481.7
123     EnhancedUSVolumeStorage, // 1.2.840.10008.5.1.4.1.1.6.2
124     XRayRadiationDoseSR, // 1.2.840.10008.5.1.4.1.1.88.67
125     VLEndoscopicImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.1
126     BreastTomosynthesisImageStorage, // 1.2.840.10008.5.1.4.1.1.13.1.3
127     FujiPrivateCRImageStorage, // 1.2.392.200036.9125.1.1.2
128     OphthalmicPhotography8BitImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.5.1
129     OphthalmicTomographyImageStorage, // 1.2.840.10008.5.1.4.1.1.77.1.5.4
130     VLMicroscopicImageStorage,
131     EnhancedPETImageStorage,
132     VideoPhotographicImageStorage,
133     XRay3DCraniofacialImageStorage,
134     IVOCForPresentation,
135     IVOCForProcessing,
136     LegacyConvertedEnhancedCTImageStorage,
137     LegacyConvertedEnhancedMRIImageStorage,
138     LegacyConvertedEnhancedPETImageStorage,
139     BreastProjectionXRayImageStorageForPresentation,
140     BreastProjectionXRayImageStorageForProcessing,
141     HardcopyColorImageStorage,
142     EnhancedMRColorImageStorage,
143     FujiPrivateMammoCRImageStorage,
144     OphthalmicPhotography16BitImageStorage,
145     VideoMicroscopicImageStorage,
146     MS_END
147 } MStype; // Media Storage Type
148
149 typedef enum {
150     NoObject = 0, // DICOMDIR
151     Video, // Most common, include image, video and volume

```

```

152     Waveform, // Isn't it simply a 1D video ?
153     Audio, // ???
154     PDF,
155     URI, // URL...
156     Segmentation, // TODO
157     ObjectEnd
158 } ObjectType;
159
160 static const char* GetMSString(MSType ts);
161
162 const char* GetString() const;
163 static MSType GetMSType(const char *str);
164
165 MediaStorage(MSType type = MS_END):MSField(type) {}
166
167 static bool IsImage(MSType ts);
168
169 operator MSType ()const { return MSField; }
170
171 const char *GetModality() const;
172 unsigned int GetModalityDimension() const;
173
174 static unsigned int GetNumberOfMSType();
175 static unsigned int GetNumberOfMSString();
176 static unsigned int GetNumberOfModality();
177
178 bool SetFromFile(File const &file);
179
180 bool SetFromDataSet(DataSet const &ds); // Will get the SOP Class UID
181 bool SetFromHeader(FileMetaInformation const &fmi); // Will get the Media Storage SOP Class UID
182 bool SetFromModality(DataSet const &ds);
183 void GuessFromModality(const char *modality, unsigned int dimension = 2);
184
185 friend std::ostream &operator<<(std::ostream &os, const MediaStorage &ms);
186
187 bool IsUndefined()const { return MSField == MS_END; }
188
189 protected:
190     void SetFromSourceImageSequence(DataSet const &ds);
191
192 private:
193     bool SetFromDataSetOrHeader(DataSet const &ds, const Tag &tag);
194
195     std::string GetFromDataSetOrHeader(DataSet const &ds, const Tag &tag);
196     std::string GetFromHeader(FileMetaInformation const &fmi);
197     std::string GetFromDataSet(DataSet const &ds);
198
199 private:
200     MSType MSField;
201 };
202
203 //-----
204 inline std::ostream &operator<<(std::ostream &_os, const MediaStorage &ms)
205 {
206     const char *msstring = MediaStorage::GetMSString(ms);
207     _os << (msstring ? msstring : "INVALID MEDIA STORAGE");
208     return _os;
209 }
210
211 } // end namespace gdcms
212
213 #endif // GDCMMEDIASTORAGE_H

```

## 11.155 gdcmsMrProtocol.h File Reference

```

#include "gdcmsTypes.h"
#include "gdcmsDataSet.h"

```

Include dependency graph for gdcmsMrProtocol.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcms::MrProtocol](#)

*Class for [MrProtocol](#).*

- struct [gdcm::MrProtocol::Slice](#)
- struct [gdcm::MrProtocol::SliceArray](#)
- struct [gdcm::MrProtocol::Vector3](#)

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const MrProtocol &d)

## 11.156 gdcmMrProtocol.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 #ifndef GDCMMRPROTOCOL_H
15 #define GDCMMRPROTOCOL_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmDataSet.h"
19
20 namespace gdcm
21 {
22     class ByteValue;
23     /*
24     * Everything done in this code is for the sole purpose of writing interoperable
25     * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
26     * If you believe anything in this code violates any law or any of your rights,
27     * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
28     * find a solution.
29     */
30     //-----
31
32     class DataElement;
33     class GDCM_EXPORT MrProtocol
34     {
35     public:
36         friend std::ostream& operator<<(std::ostream &_os, const MrProtocol &d);
37         MrProtocol();
38         ~MrProtocol();
39
40         bool Load( const ByteValue * bv, const char * str, int version );
41         void Print( std::ostream &os ) const;
42
43         int GetVersion() const;
44
45         const char * GetMrProtocolByName( const char *name ) const;
46
47         bool FindMrProtocolByName( const char *name ) const;
48
49         struct Vector3

```

```

53 {
54     double dSag;
55     double dCor;
56     double dTra;
57 };
58 struct Slice
59 {
60     Vector3 Normal;
61     Vector3 Position;
62 };
63 struct SliceArray
64 {
65     std::vector< Slice > Slices;
66 };
67 bool GetSliceArray( MrProtocol::SliceArray & sa ) const;
68
69 private:
70     struct Element;
71     struct Internals;
72     Internals *Pimpl;
73 };
74 //-----
75 inline std::ostream& operator<<(std::ostream &os, const MrProtocol &d)
76 {
77     d.Print( os );
78     return os;
79 }
80
81 } // end namespace gdcmm
82 //-----
83 #endif //GDCMMRPROTOCOL_H

```

## 11.157 gdcmmParseException.h File Reference

```

#include "gdcmmException.h"
#include "gdcmmDataElement.h"

```

Include dependency graph for gdcmmParseException.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcmm::ParseException](#)  
*ParseException* Standard exception handling object.

### Namespaces

- namespace [gdcmm](#)

## 11.158 gdcmmParseException.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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7  See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.

```

```

8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPARSEEXCEPTION_H
15 #define GDCMPARSEEXCEPTION_H
16
17 #include "gdcmException.h"
18 #include "gdcmDataElement.h"
19
20 // Disable clang warning "dynamic exception specifications are deprecated".
21 // We need to be C++03 and C++11 compatible, and if we remove the 'throw()'
22 // specifier we'll get an error in C++03 by not matching the superclass.
23 #if defined(__clang__) && defined(__has_warning)
24 # if __has_warning("-Wdeprecated")
25 # pragma clang diagnostic push
26 # pragma clang diagnostic ignored "-Wdeprecated"
27 # endif
28 #endif
29
30 namespace gdcm_ns
31 {
32     class ParseException : public Exception
33     {
34     public:
35         ParseException() = default;
36         ~ParseException() throw() override {}
37
38         ParseException &operator= ( const ParseException &orig )
39         {
40             LastElement = orig.LastElement;
41             return *this;
42         }
43         ParseException(const ParseException& orig):Exception(orig)
44         {
45             LastElement = orig.LastElement;
46         }
47
48         /* virtual bool operator==( const ParseException &orig )
49         {
50             return true;
51         }*/
52
53         /*
54         // Multiple calls to what ??
55         const char* what() const throw()
56         {
57             static std::string strwhat;
58             std::ostringstream oswhat;
59             oswhat << File << ":" << Line << ":\n";
60             oswhat << Description;
61             strwhat = oswhat.str();
62             return strwhat.c_str();
63         }
64         */
65         void SetLastElement(DataElement& de)
66         {
67             LastElement = de;
68         }
69         const DataElement& GetLastElement()const { return LastElement; }
70
71     private:
72         // Store last parsed element before error:
73         DataElement LastElement;
74     };
75 } // end namespace gdcm_ns
76
77 // Undo warning suppression.
78 #if defined(__clang__) && defined(__has_warning)
79 # if __has_warning("-Wdeprecated")
80 # pragma clang diagnostic pop
81 # endif
82 #endif
83
84 #endif

```

## 11.159 gdcmParser.h File Reference

```
#include "gdcmTag.h"
#include "gdcmByteBuffer.h"
#include <fstream>
Include dependency graph for gdcmParser.h:
```

### Classes

- class [gdcm::Parser](#)  
*Parser ala XML\_Parser from expat (SAX)*

### Namespaces

- namespace [gdcm](#)

## 11.160 gdcmParser.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMPARSER_H
16 #define GDCMPARSER_H
17
18 #include "gdcmTag.h"
19 #error do not use
20 #include "gdcmByteBuffer.h"
21
22 #include <fstream> // std::ifstream
23
24 namespace gdcm
25 {
26     class GDCM_EXPORT Parser /*: private IStream*/
27     {
28     public:
29         typedef enum {
30             NoError,
31             NoMemoryError,
32             SyntaxError,
33             NoElementsError,
34             TagMismatchError,
35             DuplicateAttributeError,
36             JunkAfterDocElementError,
37             UndefinedEntityError,
38             UnexpectedStateError
39         } ErrorType;
40
41         Parser() : UserData(0), Buffer(), ErrorCode(NoError) {}
42         ~Parser() {}
43
44     };
45 }
```



```

50 // Parse some more of the document. The string s is a buffer containing
51 // part (or perhaps all) of the document. The number of bytes of s that
52 // are part of the document is indicated by len. This means that s
53 // doesn't have to be null terminated. It also means that if len is
54 // larger than the number of bytes in the block of memory that s points
55 // at, then a memory fault is likely. The isFinal parameter informs the
56 // parser that this is the last piece of the document. Frequently, the
57 // last piece is empty (i.e. len is zero.) If a parse error occurred,
58 // it returns 0. Otherwise it returns a non-zero value.
59 bool Parse(const char* s, int len, bool isFinal);
60
61 // Set handlers for start and end tags. Attributes are passed to the
62 // start handler as a pointer to a vector of char pointers. Each
63 // attribute seen in a start (or empty) tag occupies 2 consecutive places
64 // in this vector: the attribute name followed by the attribute value.
65 // These pairs are terminated by a null pointer.
66 typedef void (*StartElementHandler) (void *userData,
67                                     const Tag &tag,
68                                     const char *atts[]);
69 typedef void (*EndElementHandler) (void *userData, const Tag &name);
70 void SetElementHandler(StartElementHandler start, EndElementHandler end);
71
72 // Return what type of error has occurred.
73 ErrorType GetErrorCode() const;
74
75 // Return a string describing the error corresponding to code.
76 // The code should be one of the enums that can be returned from
77 // GetErrorCode.
78 static const char *GetErrorString(ErrorType const &err);
79
80 // Return the byte offset of the position.
81 unsigned long GetCurrentByteIndex() const;
82
83 // Miscellaneous functions
84
85 // The functions in this section either obtain state information from
86 // the parser or can be used to dynamically set parser options.
87
88 // This sets the user data pointer that gets passed to handlers.
89 void SetUserData(void *userData);
90
91 // This returns the user data pointer that gets passed to handlers.
92 void * GetUserData() const;
93
94 protected:
95
96 // This is just like Parse, except in this case expat provides the buffer.
97 // By obtaining the buffer from expat with the GetBuffer function,
98 // the application can avoid double copying of the input.
99 bool ParseBuffer(int len, bool isFinal);
100
101 // Obtain a buffer of size len to read a piece of the document into.
102 // A NULL value is returned if expat can't allocate enough memory for
103 // this buffer. This has to be called prior to every call to ParseBuffer.
104 char *GetBuffer(int len);
105
106 ErrorType Process();
107
108 private:
109     std::ifstream Stream;
110     void* UserData;
111     ByteBuffer Buffer;
112     ErrorType ErrorCode;
113
114     StartElementHandler StartElement;
115     EndElementHandler EndElement;
116 };
117
118 } // end namespace gdcm
119
120 #endif //GDCMPARSER_H

```

## 11.161 gdcmPDBelement.h File Reference

```

#include "gdcmTag.h"
#include "gdcmVM.h"

```

```
#include "gdcmVR.h"
#include "gdcmByteValue.h"
#include "gdcmSmartPointer.h"
```

Include dependency graph for gdcmPDBElement.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::PDBElement](#)  
*Class to represent a PDB [Element](#).*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PDBElement &val)`

## 11.162 gdcmPDBElement.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPDBELEMENT_H
15 #define GDCMPDBELEMENT_H
16
17 #include "gdcmTag.h"
18 #include "gdcmVM.h"
19 #include "gdcmVR.h"
20 #include "gdcmByteValue.h"
21 #include "gdcmSmartPointer.h"
22
23 namespace gdcm
24 {
25     class GDCM_EXPORT PDBElement
26     {
27     public:
28         PDBElement() = default;
29
30         friend std::ostream& operator<<(std::ostream &os, const PDBElement &val);
31
32         const char *GetName()const { return NameField.c_str(); }
33         void SetName(const char *name) { NameField = name; }
34
35         const char *GetValue()const { return ValueField.c_str(); }
36         void SetValue(const char *value) { ValueField = value; }
37
38         bool operator==(const PDBElement &de)const
39     {
```

```

46     return ValueField == de.ValueField
47     && NameField == de.NameField;
48 }
49
50 protected:
51     std::string NameField;
52     std::string ValueField;
53 };
54 //-----
55 inline std::ostream& operator<<(std::ostream &os, const PDBElement &val)
56 {
57     os << val.NameField;
58     os << " \n";
59     os << val.ValueField;
60     os << "\n";
61
62     return os;
63 }
64
65 } // end namespace gdcm
66
67 #endif //GDCMPDBELEMENT_H

```

## 11.163 gdcmPDBHeader.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmDataSet.h"
#include "gdcmPDBElement.h"

```

Include dependency graph for gdcmPDBHeader.h:

### Classes

- class [gdcm::PDBHeader](#)  
Class for [PDBHeader](#).

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PDBHeader &d)`

## 11.164 gdcmPDBHeader.h

[Go to the documentation of this file.](#)

```

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2
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8

```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPDBHEADER_H
15 #define GDCMPDBHEADER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmDataSet.h"
19 #include "gdcmPDBelement.h"
20
21 namespace gdcm
22 {
23
24 /*
25 * Everything done in this code is for the sole purpose of writing interoperable
26 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
27 * If you believe anything in this code violates any law or any of your rights,
28 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
29 * find a solution.
30 */
31 //-----
32
33 class DataElement;
34 class PrivateTag;
35 class GDCM_EXPORT PDBHeader
36 {
37     friend std::ostream& operator<<(std::ostream &_os, const PDBHeader &d);
38 public:
39     PDBHeader() = default;
40     ~PDBHeader() = default;
41
42     bool LoadFromDataElement(DataElement const &de);
43
44     void Print(std::ostream &os) const;
45
46     static const PrivateTag &GetPDBInfoTag();
47
48     const PDBelement &GetPDBelementByName(const char *name);
49
50     bool FindPDBelementByName(const char *name);
51
52 protected:
53     const PDBelement& GetPDBeend() const;
54
55 private:
56     int readprotocoldatablock(const char *input, size_t inputlen, bool verbose);
57     std::vector<PDBelement> InternalPDBDataSet;
58     static PDBelement PDBeend;
59     bool IsXML;
60     std::string xmltxt;
61 };
62 //-----
63 inline std::ostream& operator<<(std::ostream &os, const PDBHeader &d)
64 {
65     d.Print( os );
66     return os;
67 }
68
69 } // end namespace gdcm
70 //-----
71 #endif //GDCMPDBHEADER_H

```

## 11.165 gdcmPreamble.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmVL.h"
```

Include dependency graph for gdcmPreamble.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Preamble](#)

*DICOM Preamble (Part 10)*

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const Preamble &val)`

## 11.166 gdcmPreamble.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPREAMBLE_H
15 #define GDCMPREAMBLE_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmVL.h"
19
20 namespace gdcm
21 {
22
26 class GDCM_EXPORT Preamble
27 {
28 public:
29     Preamble();
30     ~Preamble();
31
32     friend std::ostream &operator<<(std::ostream &os, const Preamble &val);
33
34     void Clear();
35
36     void Valid();
37     void Create();
38     void Remove();
39
40     std::istream &Read(std::istream &is);
41
42     std::ostream const &Write(std::ostream &os) const;
43
44     void Print(std::ostream &os) const;
45
46     const char *GetInternal()const { return Internal; }
47
48     bool IsEmpty()const { return !Internal; }
49
50     VL GetLength()const { return 128 + 4; }
51
52     Preamble(Preamble const &)
53     {
54         Create();
55     }
56     Preamble& operator=(Preamble const &)
57     {

```

```

66     Create();
67     return *this;
68 }
69 protected:
70 //
71 bool IsValid()const {
72     // is (IsValid == true) => Internal was read
73     return true;
74 }
75
76 private:
77     char *Internal;
78 };
79 //-----
80 inline std::ostream& operator<<(std::ostream &os, const Preamble &val)
81 {
82     os << val.Internal;
83     return os;
84 }
85
86 } // end namespace gdcm
87
88 #endif //GDCMPREAMBLE_H

```

## 11.167 gdcmPrivateTag.h File Reference

```

#include "gdcmTag.h"
#include "gdcmVR.h"
#include "gdcmDataElement.h"
#include <iostream>
#include <iomanip>
#include <string>
#include <algorithm>
#include <string.h>
#include <ctype.h>

```

Include dependency graph for gdcmPrivateTag.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::PrivateTag](#)  
Class to represent a Private DICOM Data [Element](#) ([Attribute](#)) [Tag](#) ([Group](#), [Element](#), [Owner](#))

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const PrivateTag &val)

## 11.168 gdcmPrivateTag.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPRIVATETAG_H
15 #define GDCMPRIVATETAG_H
16
17 #include "gdcmTag.h"
18 #include "gdcmVR.h"
19 #include "gdcmDataElement.h"
20
21 #include <iostream>
22 #include <iomanip>
23 #include <string>
24 #include <algorithm>
25
26 #include <string.h> // strlen
27 #include <ctype.h> // tolower
28
29 namespace gdcm_ns
30 {
31
32 // TODO: We could save some space since we only store 8bits for element
33 class GDCM_EXPORT PrivateTag : public Tag
34 {
35     friend std::ostream& operator<<(std::ostream &_os, const PrivateTag &_val);
36 public:
37     PrivateTag(uint16_t group = 0, uint16_t element = 0, const char *owner = "") : Tag(group, element), Owner(owner)
38     { LOComp::Trim(owner) : "" }
39     // truncate the high bits
40     SetElement( (uint8_t)element );
41
42     PrivateTag( Tag const & t, const char *owner = "") : Tag(t), Owner(owner ? LOComp::Trim(owner) : "") {
43         // truncate the high bits
44         SetElement( (uint8_t)t.GetElement());
45     }
46
47     const char *GetOwner()const { return Owner.c_str(); }
48     void SetOwner(const char *owner) { if(owner) Owner = LOComp::Trim(owner); }
49
50     PrivateTag &operator=(const PrivateTag &_val)
51     {
52         SetElementTag( _val.GetElementTag() );
53         Owner = _val.Owner;
54         return *this;
55     }
56
57     bool operator==(const Tag &_val)const
58     {
59         return GetElementTag() == _val.GetElementTag();
60     }
61     bool operator==(const PrivateTag &_val)const
62     {
63         return GetElementTag() == _val.GetElementTag() && Owner == _val.Owner;
64     }
65     bool operator!=(const Tag &_val)const
66     {
67         return GetElementTag() != _val.GetElementTag();
68     }
69     bool operator!=(const PrivateTag &_val)const
70     {
71         return GetElementTag() != _val.GetElementTag() || Owner != _val.Owner;
72     }
73
74     bool operator<(const PrivateTag &_val) const;
75
76     bool ReadFromCommaSeparatedString(const char *str);

```

```

83
84     DataElement GetAsDataElement() const;
85
86 private:
87     // SIEMENS MED, GEMS_PETD_01 ...
88     std::string Owner;
89 };
90
91 inline std::ostream& operator<<(std::ostream &os, const PrivateTag &val)
92 {
93     //assert( !val.Owner.empty() );
94     os.setf( std::ios::right );
95     os << std::hex << '(' << std::setw( 4 ) << std::setfill( '0' )
96         << val[0] << ',' << std::setw( 2 ) << std::setfill( '0' )
97         << val[1] << ',';
98     os << val.Owner;
99     os << ')' << std::setfill( ' ' ) << std::dec;
100     return os;
101 }
102
103 } // end namespace gdcms_ns
104
105 #endif //GDCMPRIVATETAG_H

```

## 11.169 gdcmsReader.h File Reference

```
#include "gdcmsFile.h"
```

```
#include <fstream>
```

Include dependency graph for gdcmsReader.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcms::Reader](#)  
*Reader* ala DOM (Document *Object* Model)

### Namespaces

- namespace [gdcms](#)

## 11.170 gdcmsReader.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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4
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMREADER_H
15 #define GDCMREADER_H
16
17 #include "gdcmsFile.h"

```



```

18
19 #include <fstream>
20
21 namespace gdcm_ns
22 {
23     class StreamImageReader;
24     class GDCM_EXPORT Reader
25     {
26     public:
27         Reader();
28         virtual ~Reader();
29
30         virtual bool Read(); // Execute()
31
32         void SetFileName(const char *filename_native);
33
34         void SetStream(std::istream &input_stream) {
35             Stream = &input_stream;
36         }
37
38         const File &GetFile()const { return *F; }
39
40         File &GetFile() { return *F; }
41
42         void SetFile(File& file) { F = &file; }
43
44         bool ReadUpToTag(const Tag & tag, std::set<Tag> const & skiptags = std::set<Tag>() );
45
46         bool ReadSelectedTags(std::set<Tag> const & tags, bool readvalues = true);
47
48         bool ReadSelectedPrivateTags(std::set<PrivateTag> const & ptags, bool readvalues = true);
49
50         bool CanRead() const;
51
52         size_t GetStreamCurrentPosition() const;
53
54     protected:
55         bool ReadPreamble();
56         bool ReadMetaInformation();
57         bool ReadDataSet();
58
59         SmartPointer<File> F;
60
61         friend class StreamImageReader; //need to be friended to be able to grab the GetStreamPtr
62
63         //this function is added for the StreamImageReader, which needs to read
64         //up to the pixel data and then stops right before reading the pixel data.
65         //it's used to get that position, so that reading can continue
66         //apace once the read function is called.
67         //so, this function gets the stream directly, and then allows for position information
68         //from the tellg function, and allows for stream/pointer manip in order
69         //to read the pixel data. Note, of course, that reading pixel elements
70         //will still have to be subject to endianness swaps, if necessary.
71         std::istream* GetStreamPtr()const { return Stream; }
72
73     private:
74         template <typename T_Caller>
75         bool InternalReadCommon(const T_Caller &caller);
76         TransferSyntax GuessTransferSyntax();
77         std::istream *Stream;
78         std::ifstream *Ifstream;
79
80         // prevent copy/move to avoid 2 ifstream leak
81         Reader(const Reader &) = delete;
82         Reader &operator=(const Reader &) = delete;
83         Reader(const Reader &&) = delete;
84         Reader &operator=(const Reader &&) = delete;
85     };
86
87 } // end namespace gdcm_ns
88
89 #endif //GDCMREADER_H

```

## 11.171 gdcmSequenceOfFragments.h File Reference

```
#include "gdcmValue.h"
#include "gdcmVL.h"
#include "gdcmFragment.h"
#include "gdcmBasicOffsetTable.h"
Include dependency graph for gdcmSequenceOfFragments.h:
```

### Classes

- class [gdcm::SequenceOfFragments](#)  
*Class to represent a Sequence Of Fragments.*

### Namespaces

- namespace [gdcm](#)

## 11.172 gdcmSequenceOfFragments.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSEQUENCEOFFRAGMENTS_H
15 #define GDCMSEQUENCEOFFRAGMENTS_H
16
17 #include "gdcmValue.h"
18 #include "gdcmVL.h"
19 #include "gdcmFragment.h"
20 #include "gdcmBasicOffsetTable.h"
21
22 namespace gdcm_ns
23 {
24
25     // FIXME gdcmSequenceOfItems and gdcmSequenceOfFragments
26     // should be rethink (duplicate code)
27
28     class GDCM_EXPORT SequenceOfFragments : public Value
29     {
30     public:
31         // Typdefs:
32         typedef std::vector<Fragment> FragmentVector;
33         typedef FragmentVector::size_type SizeType;
34         typedef FragmentVector::iterator Iterator;
35         typedef FragmentVector::const_iterator ConstIterator;
36         Iterator Begin() { return Fragments.begin(); }
37         Iterator End() { return Fragments.end(); }
38         ConstIterator Begin() const { return Fragments.begin(); }
39         ConstIterator End() const { return Fragments.end(); }
40
41         SequenceOfFragments():Table(),SequenceLengthField(0xFFFFFFFF) {}
42
43         VL GetLength()const override {
```

```

49     return SequenceLengthField;
50 }
51
52 void SetLength(VL length) override {
53     SequenceLengthField = length;
54 }
55
56 void Clear() override;
57
58 void AddFragment(Fragment const &item);
59
60 // Compute the length of all fragments (and fragments only!).
61 // Basically the size of the PixelData as stored (in bytes).
62 unsigned long ComputeByteLength() const;
63
64 // Compute the length of fragments (in bytes)+ length of tag...
65 // to be used for computation of Group Length
66 VL ComputeLength() const;
67
68 // Get the buffer
69 bool GetBuffer(char *buffer, unsigned long length) const;
70 bool GetFragBuffer(unsigned int fragNb, char *buffer, unsigned long &length) const;
71
72 SizeType GetNumberOfFragments() const;
73 const Fragment& GetFragment(SizeType num) const;
74
75 // Write the buffer of each fragment (call WriteBuffer on all Fragments, which are
76 // ByteValue). No Table information is written.
77 bool WriteBuffer(std::ostream &os) const;
78
79 const BasicOffsetTable &GetTable() const { return Table; }
80 BasicOffsetTable &GetTable() { return Table; }
81
82 template <typename TSwap>
83 std::istream& Read(std::istream &is, bool readvalues = true)
84 {
85     assert( SequenceLengthField.IsUndefined() );
86     ReadPreValue<TSwap>(is);
87     return ReadValue<TSwap>(is, readvalues);
88 }
89
90 template <typename TSwap>
91 std::istream& ReadPreValue(std::istream &is)
92 {
93     // First item is the basic offset table:
94     #if 0
95     try
96     {
97         Table.Read<TSwap>(is);
98         gdcmDebugMacro( "Table:  " << Table );
99     }
100     catch(...)
101     {
102         // throw "SIEMENS Icon thingy";
103         // Bug_Siemens_PrivateIconNoItem.dcm
104         // First thing first let's rewind
105         is.seekg(-4, std::ios::cur);
106         // FF D8 <=> Start of Image (SOI) marker
107         // FF E0 <=> APP0 Reserved for Application Use
108         if ( Table.GetTag() == Tag(0xd8ff, 0xe0ff) )
109         {
110             Table = BasicOffsetTable(); // clear up stuff
111             //Table.SetByteValue( "", 0 );
112             Fragment frag;
113             if( FillFragmentWithJPEG( frag, is ) )
114             {
115                 Fragments.push_back( frag );
116             }
117             return is;
118         }
119         else
120         {
121             throw "Catch me if you can";
122             //assert(0);
123         }
124     }
125     #else
126     Table.Read<TSwap>(is);
127     gdcmDebugMacro( "Table:  " << Table );
128     #endif
129     return is;
130 }

```

```

133 }
134
135 template <typename TSwap>
136 std::istream& ReadValue(std::istream& is, bool /*readvalues*/)
137 {
138     const Tag seqDelItem(0xfffe,0xe0dd);
139     // not used for now...
140     Fragment frag;
141     try
142     {
143         while( frag.Read<TSwap>(is) && frag.GetTag() != seqDelItem )
144         {
145             //gdcDebugMacro( "Frag: " << frag );
146             Fragments.push_back( frag );
147         }
148         assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
149     }
150     catch(Exception &ex)
151     {
152         (void)ex;
153 #ifdef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
154     // that's ok ! In all cases the whole file was read, because
155     // Fragment::Read only fail on eof() reached 1.
156     // SIEMENS-JPEG-CorruptFrag.dcm is more difficult to deal with, we have a
157     // partial fragment, read we decide to add it anyway to the stack of
158     // fragments (eof was reached so we need to clear error bit)
159     if( frag.GetTag() == Tag(0xfffe,0xe000) )
160     {
161         gdcWarningMacro( "Pixel Data Fragment could be corrupted. Use file at own risk" );
162         Fragments.push_back( frag );
163         is.clear(); // clear the error bit
164     }
165     // 2. GENESIS_SIGNA-JPEG-CorruptFrag.dcm
166     else if ( frag.GetTag() == Tag(0xddff,0x00e0) )
167     {
168         assert( Fragments.size() == 1 );
169         const ByteValue *bv = Fragments[0].GetByteValue();
170         assert( (unsigned char)bv->GetPointer()[ bv->GetLength() - 1 ] == 0xfe );
171         // Yes this is an extra copy, this is a bug anyway, go fix YOUR code
172         Fragments[0].SetByteValue( bv->GetPointer(), bv->GetLength() - 1 );
173         gdcWarningMacro( "JPEG Fragment length was declared with an extra byte"
174             " at the end: stripped !" );
175         is.clear(); // clear the error bit
176     }
177     // 3. LEICA/WSI
178     else if ( (frag.GetTag().GetGroup() == 0x00ff)
179         && ((frag.GetTag().GetElement() & 0x00ff) == 0xe0) )
180     {
181         // Looks like there is a mess with offset and odd byte array
182         // We are going first to backtrack one byte back, and then use a
183         // ReadBacktrack function which in turn may backtrack up to 10 bytes
184         // backward. This appears to be working on a set of DICOM/WSI files from
185         // LEICA
186         gdcWarningMacro( "Trying to fix the even-but-odd value length bug #1" );
187         assert( Fragments.size() );
188         const size_t lastf = Fragments.size() - 1;
189         const ByteValue *bv = Fragments[ lastf ].GetByteValue();
190         const char *a = bv->GetPointer();
191         gdcAssertAlwaysMacro( (unsigned char)a[ bv->GetLength() - 1 ] == 0xfe );
192         Fragments[ lastf ].SetByteValue( bv->GetPointer(), bv->GetLength() - 1 );
193         is.seekg( -9, std::ios::cur );
194         assert( is.good() );
195         while( frag.ReadBacktrack<TSwap>(is) && frag.GetTag() != seqDelItem )
196         {
197             gdcDebugMacro( "Frag: " << frag );
198             Fragments.push_back( frag );
199         }
200         assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
201     }
202     // 4. LEICA/WSI (bis)
203     else if ( frag.GetTag().GetGroup() == 0xe000 )
204     {
205         // Looks like there is a mess with offset and odd byte array
206         // We are going first to backtrack one byte back, and then use a
207         // ReadBacktrack function which in turn may backtrack up to 10 bytes
208         // backward. This appears to be working on a set of DICOM/WSI files from
209         // LEICA
210         gdcWarningMacro( "Trying to fix the even-but-odd value length bug #2" );
211         assert( Fragments.size() );
212         const size_t lastf = Fragments.size() - 1;
213         const ByteValue *bv = Fragments[ lastf ].GetByteValue();

```

```

214     const char *a = bv->GetPointer();
215     gdcmAssertAlwaysMacro( (unsigned char)a[ bv->GetLength() - 2 ] == 0xfe );
216     Fragments[ lastf ].SetByteValue( bv->GetPointer(), bv->GetLength() - 2 );
217     is.seekg( -10, std::ios::cur );
218     assert( is.good() );
219     while( frag.ReadBacktrack<TSwap>(is) && frag.GetTag() != seqDelItem )
220     {
221         gdcmDebugMacro( "Frag: " << frag );
222         Fragments.push_back( frag );
223     }
224     assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
225 }
226 // 5. LEICA/WSI (ter)
227 else if ( (frag.GetTag().GetGroup() & 0x00ff) == 0x00e0
228 && (frag.GetTag().GetElement() & 0xff00) == 0x0000 )
229 {
230     // Looks like there is a mess with offset and odd byte array
231     // We are going first to backtrack one byte back, and then use a
232     // ReadBacktrack function which in turn may backtrack up to 10 bytes
233     // backward. This appears to be working on a set of DICOM/WSI files from
234     // LEICA
235     gdcmWarningMacro( "Trying to fix the even-but-odd value length bug #3" );
236     assert( Fragments.size() );
237     const size_t lastf = Fragments.size() - 1;
238     const ByteValue *bv = Fragments[ lastf ].GetByteValue();
239     const char *a = bv->GetPointer();
240     gdcmAssertAlwaysMacro( (unsigned char)a[ bv->GetLength() - 3 ] == 0xfe );
241     Fragments[ lastf ].SetByteValue( bv->GetPointer(), bv->GetLength() - 3 );
242     is.seekg( -11, std::ios::cur );
243     assert( is.good() );
244     while( frag.ReadBacktrack<TSwap>(is) && frag.GetTag() != seqDelItem )
245     {
246         gdcmDebugMacro( "Frag: " << frag );
247         Fragments.push_back( frag );
248     }
249     assert( frag.GetTag() == seqDelItem && frag.GetVL() == 0 );
250 }
251 else
252 {
253     // 3. gdcm-JPEG-LossLess3a.dcm: easy case, an extra tag was found
254     // instead of terminator (eof is the next char)
255     gdcmWarningMacro( "Reading failed at Tag:" << frag.GetTag() << " Index #"
256 << Fragments.size() << " Offset " << is.tellg() << ". Use file at own risk."
257 << ex.what() );
258 }
259 #endif /* GDCM_SUPPORT_BROKEN_IMPLEMENTATION */
260 }
261
262 return is;
263 }
264
265 template <typename TSwap>
266 std::ostream &Write(std::ostream &os) const
267 {
268     if( !Table.Write<TSwap>(os) )
269     {
270         assert( 0 && "Should not happen" );
271         return os;
272     }
273     for( ConstIterator it = Begin(); it != End(); ++it )
274     {
275         it->Write<TSwap>(os);
276     }
277     // seq del item is not stored, write it !
278     const Tag seqDelItem(0xffff,0xe0dd);
279     seqDelItem.Write<TSwap>(os);
280     VL zero = 0;
281     zero.Write<TSwap>(os);
282
283     return os;
284 }
285
286 // #if defined(SWIGPYTHON) || defined(SWIGCSharp) || defined(SWIGJAVA)
287 // For now leave it there, this does not make sense in the C++ layer
288 // Create a new object
289 static SmartPointer<SequenceOfFragments> New()
290 {
291     return new SequenceOfFragments();
292 }
293 #endif
294

```

```

295 protected:
296 public:
297     void Print(std::ostream &os) const override {
298         os << "SQ L= " << SequenceLengthField << "\n";
299         os << "Table:" << Table << "\n";
300         for(ConstIterator it = Begin(); it != End(); ++it)
301             {
302                 os << "    " << *it << "\n";
303             }
304         assert( SequenceLengthField.IsUndefined() );
305         {
306             const Tag seqDelItem(0xfffe,0xe0dd);
307             VL zero = 0;
308             os << seqDelItem;
309             os << "\t" << zero;
310         }
311     }
312     bool operator==(const Value &val) const override
313     {
314         const SequenceOfFragments &sqf = dynamic_cast<const SequenceOfFragments&>(val);
315         return Table == sqf.Table &&
316             SequenceLengthField == sqf.SequenceLengthField &&
317             Fragments == sqf.Fragments;
318     }
319 private:
320     BasicOffsetTable Table;
321     VL SequenceLengthField;
322     FragmentVector Fragments;
323 private:
324     bool FillFragmentWithJPEG( Fragment & frag, std::istream & is );
325 };
326 // end namespace gdcm_ns
327 #endif //GDCMSEQUENCEOFFRAGMENTS_H

```

## 11.173 gdcmSequenceOfItems.h File Reference

```

#include "gdcmValue.h"
#include "gdcmItem.h"
#include <vector>
#include <cstring>
#include "gdcmSequenceOfItems.txx"

```

Include dependency graph for gdcmSequenceOfItems.h:

### Classes

- class [gdcm::SequenceOfItems](#)  
*Class to represent a Sequence Of Items.*

### Namespaces

- namespace [gdcm](#)

## 11.174 gdcmSequenceOfItems.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMSEQUENCEOFITEMS_H
16 #define GDCMSEQUENCEOFITEMS_H
17
18 #include "gdcmValue.h"
19 #include "gdcmItem.h"
20
21 #include <vector>
22 #include <cstring> // strcmp
23
24 namespace gdcm_ns
25 {
26
27     class GDCM_EXPORT SequenceOfItems : public Value
28     {
29     public:
30         // Typdefs:
31         typedef std::vector< Item > ItemVector;
32         typedef ItemVector::size_type SizeType;
33         typedef ItemVector::iterator Iterator;
34         typedef ItemVector::const_iterator ConstIterator;
35         Iterator Begin() { return Items.begin(); }
36         Iterator End() { return Items.end(); }
37         ConstIterator Begin()const { return Items.begin(); }
38         ConstIterator End()const { return Items.end(); }
39
40         SequenceOfItems():SequenceLengthField(0xFFFFFFF) { }
41         //SequenceOfItems(VL const &vl = 0xFFFFFFF):SequenceLengthField(vl),NType(type) { }
42
43         VL GetLength()const override { return SequenceLengthField; }
44         void SetLength(VL length)override {
45             SequenceLengthField = length;
46         }
47         void SetLengthToUndefined();
48         bool IsUndefinedLength()const {
49             return SequenceLengthField.IsUndefined();
50         }
51
52         template <typename TDE>
53         VL ComputeLength() const;
54
55         void Clear() override;
56
57         void AddItem(Item const &item);
58
59         Item & AddNewUndefinedLengthItem();
60
61         bool RemoveItemByIndex( const SizeType index );
62
63         bool IsEmpty()const { return Items.empty(); };
64         SizeType GetNumberOfItems()const { return Items.size(); }
65         void SetNumberOfItems(SizeType n) { Items.resize(n); }
66
67         /* WARNING: first item is #1 (see DICOM standard)
68         * Each Item shall be implicitly assigned an ordinal position starting with the value 1 for the
69         * first Item in the Sequence, and incremented by 1 with each subsequent Item. The last Item in the
70         * Sequence shall have an ordinal position equal to the number of Items in the Sequence.
71         */
72         const Item &GetItem(SizeType position) const;
73         Item &GetItem(SizeType position);
74
75         SequenceOfItems &operator=(const SequenceOfItems &val) {
76             SequenceLengthField = val.SequenceLengthField;
77         }
78     };
79
80 }
81
82 #endif

```

```

99     Items = val.Items;
100     return *this;
101 }
102
103 template <typename TDE, typename TSwap>
104 std::istream &Read(std::istream &is, bool readvalues = true)
105 {
106     (void)readvalues;
107     const Tag seqDelItem(0xfffe,0xe0dd);
108     if( SequenceLengthField.IsUndefined() )
109     {
110         Item item;
111         while( item.Read<TDE,TSwap>(is) && item.GetTag() != seqDelItem )
112         {
113             //gdcmlDebugMacro( "Item: " << item );
114             assert( item.GetTag() != seqDelItem );
115             Items.push_back( item );
116             item.Clear();
117         }
118         //assert( item.GetTag() == seqDelItem && item.GetVL() == 0 );
119     }
120     else
121     {
122         Item item;
123         VL l = 0;
124         //is.seekg( SequenceLengthField, std::ios::cur ); return is;
125         while( l != SequenceLengthField )
126         {
127             try
128             {
129                 item.Read<TDE,TSwap>(is);
130             }
131             catch( Exception &ex )
132             {
133                 if( strcmp( ex.GetDescription(), "Changed Length" ) == 0 )
134                 {
135                     VL newlength = l + item.template GetLength<TDE>();
136                     if( newlength > SequenceLengthField )
137                     {
138                         // BogusItemAndSequenceLength.dcm
139                         gdcmlWarningMacro( "SQ length is wrong" );
140                         SequenceLengthField = newlength;
141                     }
142                 }
143                 else
144                 {
145                     throw ex;
146                 }
147             }
148             #ifndef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
149             if( item.GetTag() == seqDelItem )
150             {
151                 gdcmlWarningMacro( "SeqDelItem found in defined length Sequence. Skipping" );
152                 assert( item.GetVL() == 0 );
153                 assert( item.GetNestedDataSet().Size() == 0 );
154                 // we need to pay attention that the length of the Sequence of Items will be wrong
155                 // this way. Indeed by not adding this item we are changing the size of this sqi
156             }
157             else // Not a seq del item marker
158             #endif
159             {
160                 // By design we never load them. If we were to load those attribute
161                 // as normal item it would become very complex to convert a sequence
162                 // from defined length to undefined length with the risk to write two
163                 // seq del marker
164                 Items.push_back( item );
165             }
166             l += item.template GetLength<TDE>();
167             if( l > SequenceLengthField )
168             {
169                 gdcmlDebugMacro( "Found: Length of Item larger than expected" );
170                 throw "Length of Item larger than expected";
171             }
172             assert( l <= SequenceLengthField );
173             //std::cerr << "sqi debug len: " << is.tellg() << " " << l << " " << SequenceLengthField << std::endl;
174             #ifndef GDCM_SUPPORT_BROKEN_IMPLEMENTATION
175             // MR_Philips_Intera_No_PrivateSequenceImplicitVR.dcm
176             // (0x2005, 0x1080): for some reason computation of length fails...
177             if( SequenceLengthField == 778 && l == 774 )
178             {
179                 gdcmlWarningMacro( "PMS: Super bad hack" );

```



```

180         SequenceLengthField = 1;
181         throw Exception( "Wrong Length" );
182         //l = SequenceLengthField;
183     }
184     // Bug_Philips_ItemTag_3F3F
185     // (0x2005, 0x1080): Because we do not handle fully the bug at the item
186     // level we need to check here too
187     else if ( SequenceLengthField == 444 && l == 3*71 )
188     {
189         // This one is a double bug. Item length is wrong and impact SQ length
190         gdcmWarningMacro( "PMS: Super bad hack" );
191         l = SequenceLengthField;
192     }
193 #endif
194     }
195     assert( l == SequenceLengthField );
196     }
197     return is;
198 }
199
200 template <typename TDE,typename TSwap>
201 std::ostream const &Write(std::ostream &os) const
202 {
203     typename ItemVector::const_iterator it = Items.begin();
204     for(; it != Items.end(); ++it)
205     {
206         it->Write<TDE,TSwap>(os);
207     }
208     if( SequenceLengthField.IsUndefined() )
209     {
210         // seq del item is not stored, write it !
211         const Tag seqDelItem(0xfffe,0xe0dd);
212         seqDelItem.Write<TSwap>(os);
213         VL zero = 0;
214         zero.Write<TSwap>(os);
215     }
216
217     return os;
218 }
219
220 //protected:
221 void Print(std::ostream &os) const override {
222     os << "\t(" << SequenceLengthField << ")\n";
223     ItemVector::const_iterator it =
224         Items.begin();
225     for(; it != Items.end(); ++it)
226     {
227         os << " " << *it;
228     }
229     if( SequenceLengthField.IsUndefined() )
230     {
231         const Tag seqDelItem(0xfffe,0xe0dd);
232         VL zero = 0;
233         os << seqDelItem;
234         os << "\t" << zero;
235     }
236 }
237
238 static SmartPointer<SequenceOfItems> New()
239 {
240     return new SequenceOfItems;
241 }
242 bool FindDataElement(const Tag &t) const;
243
244 bool operator==(const Value &val) const override
245 {
246     const SequenceOfItems &sqi = dynamic_cast<const SequenceOfItems&>(val);
247     return SequenceLengthField == sqi.SequenceLengthField &&
248         Items == sqi.Items;
249 }
250
251 private:
252 public:
253     VL SequenceLengthField;
254     ItemVector Items;
255 };
256
257 } // end namespace gdc_ns
258
259 } // end namespace gdc_ns
260
261 #include "gdcSequenceOfItems.txx"
262

```

```
263 #endif //GDCMSEQUENCEOFITEMS_H
```

## 11.175 gdcmTag.h File Reference

```
#include "gdcmTypes.h"
#include <iostream>
#include <iomanip>
```

Include dependency graph for gdcmTag.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Tag](#)  
Class to represent a DICOM Data *Element* (*Attribute*) *Tag* (*Group*, *Element*).

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &\_os, const Tag &\_val)
- std::istream & [gdcm::operator>>](#) (std::istream &\_is, Tag &\_val)

## 11.176 gdcmTag.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTAG_H
15 #define GDCMTAG_H
16
17 #include "gdcmTypes.h"
18
19 #include <iostream>
20 #include <iomanip>
21
22 namespace gdcm
23 {
24
25     class GDCM_EXPORT Tag
26     {
27     public:
28         Tag(uint16_t group, uint16_t element) {
```

```

43     ElementTag.tags[0] = group; ElementTag.tags[1] = element;
44 }
47 Tag(uint32_t tag = 0) {
48     SetElementTag(tag);
49 }
50
51 friend std::ostream& operator<<(std::ostream &_os, const Tag &_val);
52 friend std::istream& operator>>(std::istream &_is, Tag &_val);
53
54
55 uint16_t GetGroup()const { return ElementTag.tags[0]; }
56 uint16_t GetElement()const { return ElementTag.tags[1]; }
57 void SetGroup(uint16_t group) { ElementTag.tags[0] = group; }
58 void SetElement(uint16_t element) { ElementTag.tags[1] = element; }
59 void SetElementTag(uint16_t group, uint16_t element) {
60     ElementTag.tags[0] = group; ElementTag.tags[1] = element;
61 }
62
63 uint32_t GetElementTag()const {
64 #ifndef GDCM_WORDS_BIGENDIAN
65     return (ElementTag.tag<<16) | (ElementTag.tag>>16);
66 #else
67     return ElementTag.tag;
68 #endif
69 }
70
71 void SetElementTag(uint32_t tag) {
72 #ifndef GDCM_WORDS_BIGENDIAN
73     tag = ( (tag<<16) | (tag>>16) );
74 #endif
75     ElementTag.tag = tag;
76 }
77
78 const uint16_t &operator[](const unsigned int &_id)const
79 {
80     assert(_id<2);
81     return ElementTag.tags[_id];
82 }
83
84 uint16_t &operator[](const unsigned int &_id)
85 {
86     assert(_id<2);
87     return ElementTag.tags[_id];
88 }
89
90 Tag &operator=(const Tag &_val)
91 {
92     ElementTag.tag = _val.ElementTag.tag;
93     return *this;
94 }
95
96 bool operator==(const Tag &_val)const
97 {
98     return ElementTag.tag == _val.ElementTag.tag;
99 }
100
101 bool operator!=(const Tag &_val)const
102 {
103     return ElementTag.tag != _val.ElementTag.tag;
104 }
105
106 // FIXME FIXME FIXME TODO
107 // the following is pretty dumb. Since we have control over who is group
108 // and who is element, we should reverse them in little endian and big endian case
109 // since what we really want is fast comparison and not guarantee that group is in #0
110 // ...
111
112 bool operator<(const Tag &_val)const
113 {
114 #ifndef GDCM_WORDS_BIGENDIAN
115     if( ElementTag.tags[0] < _val.ElementTag.tags[0] )
116         return true;
117     if( ElementTag.tags[0] == _val.ElementTag.tags[0]
118         && ElementTag.tags[1] < _val.ElementTag.tags[1] )
119         return true;
120     return false;
121 #else
122     // Plain comparison is enough!
123     return ( ElementTag.tag < _val.ElementTag.tag );
124 #endif
125 }
126
127 bool operator<=(const Tag &t2)const
128 {
129     const Tag &t1 = *this;
130     return t1 == t2 || t1 < t2;
131 }

```

```

137     }
138
139     Tag(const Tag &_val)
140     {
141         ElementTag.tag = _val.ElementTag.tag;
142     }
143
144     uint32_t GetLength()const { return 4; }
145
146     bool IsPublic()const { return !(ElementTag.tags[0] % 2); }
147
148     bool IsPrivate()const { return !IsPublic(); }
149
150     //-----
151     template <typename TSwap>
152     std::istream &Read(std::istream &is)
153     {
154         if( is.read(ElementTag.bytes, 4) )
155             TSwap::SwapArray(ElementTag.tags, 2);
156         return is;
157     }
158
159     template <typename TSwap>
160     const std::ostream &Write(std::ostream &os)const
161     {
162         uint16_t copy[2];
163         copy[0]= ElementTag.tags[0];
164         copy[1]= ElementTag.tags[1];
165         TSwap::SwapArray(copy, 2);
166         return os.write((char*)(&copy), 4);
167     }
168
169     Tag GetPrivateCreator()const
170     {
171         // See PS 3.5 - 7.8.1 PRIVATE DATA ELEMENT TAGS
172         // eg: 0x0123,0x1425 -> 0x0123,0x0014
173         if( IsPrivate() && !IsPrivateCreator() )
174         {
175             Tag r = *this;
176             r.SetElement( (uint16_t)(GetElement() >> 8) );
177             return r;
178         }
179         if( IsPrivateCreator() ) return *this;
180         return Tag(0x0,0x0);
181     }
182
183     void SetPrivateCreator(Tag const &t)
184     {
185         // See PS 3.5 - 7.8.1 PRIVATE DATA ELEMENT TAGS
186         // eg: 0x0123,0x0045 -> 0x0123,0x4567
187         assert( t.IsPrivate() /*&& t.IsPrivateCreator()*/ );
188         const uint16_t element = (uint16_t)(t.GetElement() << 8);
189         const uint16_t base = (uint16_t)(GetElement() << 8);
190         SetElement( (uint16_t)((base >> 8) + element) );
191         SetGroup( t.GetGroup() );
192     }
193
194     bool IsPrivateCreator()const
195     {
196         return IsPrivate() && (GetElement() <= 0xFF && GetElement() >= 0x10);
197     }
198
199     bool IsIllegal()const
200     {
201         // DICOM reserved those groups:
202         return GetGroup() == 0x0001 || GetGroup() == 0x0003 || GetGroup() == 0x0005 || GetGroup() == 0x0007
203         // This is a very special case, in private group, one cannot use element [0x01,0x09] ...
204         || (IsPrivate() && !IsPrivateCreator() && !IsGroupLength());
205         // || (IsPrivate() && GetElement() > 0x0 && GetElement() < 0x10 );
206     }
207
208     bool IsGroupLength()const
209     {
210         return GetElement() == 0x0;
211     }
212
213     bool IsGroupXX(const Tag &t)const
214     {
215         if( t.GetElement() == GetElement() )
216         {
217             if( t.IsPrivate() ) return false;
218             uint16_t group = (uint16_t)((GetGroup() >> 8) << 8);
219             return group == t.GetGroup();
220         }
221     }

```

```

235     }
236     return false;
237 }
238
244 bool ReadFromCommaSeparatedString(const char *str);
245
248 bool ReadFromContinuousString(const char *str);
249
252 std::string PrintAsContinuousString() const;
253
255 std::string PrintAsContinuousUpperCaseString() const;
256
259 bool ReadFromPipeSeparatedString(const char *str);
260
263 std::string PrintAsPipeSeparatedString() const;
264
265 private:
266 union { uint32_t tag; uint16_t tags[2]; char bytes[4]; } ElementTag;
267 };
268 //-----
269 inline std::istream& operator>>(std::istream &_is, Tag &_val)
270 {
271     char c;
272     _is >> c;
273     uint16_t a, b;
274     _is >> std::hex >> a;
275     //_is >> std::hex >> _val[0];
276     //_is >> std::hex >> _val.ElementTag.tags[0];
277     _is >> c;
278     //_is >> _val[1];
279     //_is >> std::hex >> _val.ElementTag.tags[1];
280     _is >> std::hex >> b;
281     _is >> c;
282     _val.SetGroup( a );
283     _val.SetElement( b );
284     return _is;
285 }
286
287 inline std::ostream& operator<<(std::ostream &_os, const Tag &_val)
288 {
289     _os.setf( std::ios::right);
290     _os << std::hex << '(' << std::setw( 4 ) << std::setfill( '0' )
291         << _val[0] << ',' << std::setw( 4 ) << std::setfill( '0' )
292         << _val[1] << ')' << std::setfill( ' ' ) << std::dec;
293     return _os;
294 }
295
296 } // end namespace gdcm
297
298 #endif //GDCMTAG_H

```

## 11.177 gdcmTagToVR.h File Reference

#include "gdcmVR.h"

Include dependency graph for gdcmTagToVR.h:

### Namespaces

- namespace [gdcm](#)

### Functions

- VR::VRType [gdcm::GetVRFromTag](#) (Tag const &tag)

## 11.178 gdcmTagToVR.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTAGTOVR_H
15 #define GDCMTAGTOVR_H
16
17 #include "gdcmVR.h"
18
19 namespace gdcm
20 {
21     class Tag;
22     VR::VRType GetVRFromTag( Tag const & tag );
23 }
24
25 #endif // GDCMTAGTOVR_H

```

## 11.179 gdcmTransferSyntax.h File Reference

```
#include "gdcmSwapCode.h"
```

Include dependency graph for gdcmTransferSyntax.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::TransferSyntax](#)  
*Class to manipulate Transfer Syntax.*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const TransferSyntax &ts)`

## 11.180 gdcmTransferSyntax.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTRANSFERSYNTAX_H
15 #define GDCMTRANSFERSYNTAX_H
16
17 #include "gdcmSwapCode.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT TransferSyntax
23     {
24     public:
25         typedef enum {
26             Unknown = 0,
27             Explicit,
28             Implicit
29         } NegotiatedType;
30
31         #if 0
32         //NOT FLEXIBLE, since forces user to update lib every time new module
33         //comes out...
34         // TODO
35         typedef enum {
36             NoSpacing = 0,
37             PixelSpacing,
38             ImagerPixelSpacing,
39             PixelAspectRatio
40         } ImageSpacingType;
41         ImageSpacingType GetImageSpacing();
42         #endif
43
44         typedef enum {
45             ImplicitVRLittleEndian = 0,
46             ImplicitVRBigEndianPrivateGE,
47             ExplicitVRLittleEndian,
48             DeflatedExplicitVRLittleEndian,
49             ExplicitVRBigEndian,
50             JPEGBaselineProcess1,
51             JPEGExtendedProcess2_4,
52             JPEGExtendedProcess3_5,
53             JPEGsSpectralSelectionProcess6_8,
54             JPEGFullProgressionProcess10_12,
55             JPEGLosslessProcess14,
56             JPEGLosslessProcess14_1,
57             JPEGLSLossless,
58             JPEGLSNearLossless,
59             JPEG2000Lossless,
60             JPEG2000,
61             JPEG2000Part2Lossless,
62             JPEG2000Part2,
63             RLELossless,
64             MPEG2MainProfile,
65             ImplicitVRBigEndianACRNEEMA,
66             WeirdPapryus,
67             CT_private_ELE,
68             JPIPReferenced,
69             MPEG2MainProfileHighLevel,
70             MPEG4AVCH264HighProfileLevel4_1,
71             MPEG4AVCH264BDcompatibleHighProfileLevel4_1,
72             TS_END
73         } TSType;
74
75         // Return the string as written in the official DICOM dict from
76         // a custom enum type
77     };
78
79 }
80
81
82
83
84
85
86
87
88
89
90
91
92
93

```

```

94 static const char* GetTSString(TSType ts);
95 static TSType GetTSType(const char *str);
96
97 NegotiatedType GetNegociatedType() const;
98
102 SwapCode GetSwapCode() const;
103
104 bool IsValid()const { return TSField != TS_END; }
105
106 operator TSType ()const { return TSField; }
107
108 // FIXME: ImplicitVRLittleEndian used to be the default, but nowadays
109 // this is rather the ExplicitVRLittleEndian instead...should be change the default ?
110 TransferSyntax(TSType type = ImplicitVRLittleEndian):TSField(type) {}
111
112 // return if dataset is encoded or not (Deflate Explicit VR)
113 bool IsEncoded() const;
114
115 bool IsImplicit() const;
116 bool IsExplicit() const;
117
118 bool IsEncapsulated() const;
119
121 bool IsLossy() const;
123 bool IsLossless() const;
125 bool CanStoreLossy() const;
126
127 const char *GetString()const { return TransferSyntax::GetTSString(TSField); }
128
129 friend std::ostream &operator<<(std::ostream &os, const TransferSyntax &ts);
130 private:
131 // DO NOT EXPOSE the following. Internal details of TransferSyntax
132 bool IsImplicit(TSType ts) const;
133 bool IsExplicit(TSType ts) const;
134 bool IsLittleEndian(TSType ts) const;
135 bool IsBigEndian(TSType ts) const;
136
137 TSType TSField;
138 };
139 //-----
140 inline std::ostream &operator<<(std::ostream &_os, const TransferSyntax &ts)
141 {
142 _os << TransferSyntax::GetTSString(ts);
143 return _os;
144 }
145 }
146
147 } // end namespace gdcm
148
149 #endif //GDCMTRANSFERSYNTAX_H

```

## 11.181 gdcmUNExplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmUNExplicitDataElement.hxx"

```

Include dependency graph for gdcmUNExplicitDataElement.h:

### Classes

- class [gdcm::UNExplicitDataElement](#)  
Class to read/write a [DataElement](#) as *UNExplicit Data Element*.

### Namespaces

- namespace [gdcm](#)



## 11.182 gdcmUNExplicitDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUNEXPLICITDATAELEMENT_H
15 #define GDCMUNEXPLICITDATAELEMENT_H
16
17 #include "gdcmDataElement.h"
18
19 namespace gdcm
20 {
21 // Data Element (UNExplicit)
22 class GDCM_EXPORT UNExplicitDataElement : public DataElement
23 {
24 public:
25     VL GetLength() const;
26
27     template <typename TSwap>
28     std::istream &Read(std::istream &is);
29
30     template <typename TSwap>
31     std::istream &ReadPreValue(std::istream &is);
32
33     template <typename TSwap>
34     std::istream &ReadValue(std::istream &is, bool readvalues = true);
35
36     template <typename TSwap>
37     std::istream &ReadWithLength(std::istream &is, VL &length);
38
39     // PURPOSELY do not provide an implementation for writing !
40     //template <typename TSwap>
41     //const std::ostream &Write(std::ostream &os) const;
42 };
43
44 } // end namespace gdcm
45
46 #include "gdcmUNExplicitDataElement.txx"
47
48 #endif //GDCMUNEXPLICITDATAELEMENT_H

```

## 11.183 gdcmUNExplicitImplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmUNExplicitImplicitDataElement.txx"

```

Include dependency graph for gdcmUNExplicitImplicitDataElement.h:

### Classes

- class [gdcm::UNExplicitImplicitDataElement](#)  
Class to read/write a [DataElement](#) as *ExplicitImplicit Data Element*.

### Namespaces

- namespace [gdcm](#)

## 11.184 gdcmUNExplicitImplicitDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUNEXPLICITIMPLICITDATAELEMENT_H
15 #define GDCMUNEXPLICITIMPLICITDATAELEMENT_H
16
17 #include "gdcmDataElement.h"
18
19 namespace gdcm
20 {
21 // Data Element (ExplicitImplicit)
22 class GDCM_EXPORT UNExplicitImplicitDataElement : public DataElement
23 {
24 public:
25     VL GetLength() const;
26
27     template <typename TSwap>
28     std::istream &Read(std::istream &is);
29
30     template <typename TSwap>
31     std::istream &ReadPreValue(std::istream &is);
32
33     template <typename TSwap>
34     std::istream &ReadValue(std::istream &is);
35
36     // PURPOSELY do not provide an implementation for writing !
37     //template <typename TSwap>
38     //const std::ostream &Write(std::ostream &os) const;
39 };
40
41 } // end namespace gdcm
42
43 #include "gdcmUNExplicitImplicitDataElement.txx"
44
45 #endif //GDCMUNEXPLICITIMPLICITDATAELEMENT_H

```

## 11.185 gdcmValue.h File Reference

```

#include "gdcmObject.h"
#include "gdcmValue.txx"

```

Include dependency graph for gdcmValue.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Value](#)  
Class to represent the value of a Data [Element](#).

### Namespaces

- namespace [gdcm](#)

## 11.186 gdcmValue.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVALUE_H
15 #define GDCMVALUE_H
16
17 #include "gdcmObject.h"
18
19 namespace gdcm { class VL; }
20 namespace gdcm_ns
21 {
22     #if !defined(SWIGPYTHON) && !defined(SWIGSHARP) && !defined(SWIGJAVA) && !defined(SWIGPHP)
23     using namespace gdcm;
24     #endif
25     class GDCM_EXPORT Value : public Object
26     {
27     public:
28         Value() = default;
29         ~Value() override = default;
30
31         virtual VL GetLength() const = 0;
32         virtual void SetLength(VL l) = 0;
33
34         virtual void Clear() = 0;
35
36         virtual bool operator==(const Value &val) const = 0;
37
38     protected:
39         friend class DataElement;
40         virtual void SetLengthOnly(VL l);
41     };
42 } // end namespace gdcm_ns
43
44 #include "gdcmValue.txx"
45
46 #endif //GDCMVALUE_H

```

## 11.187 gdcmValueIO.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmValueIO.txx"
```

Include dependency graph for gdcmValueIO.h:

### Classes

- class [gdcm::ValueIO< TDE, TSwap, TType >](#)

*Class to dispatch template calls.*

### Namespaces

- namespace [gdcm](#)

## 11.188 gdcmValueIO.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVALUEIO_H
15 #define GDCMVALUEIO_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm_ns
20 {
21     template <typename TDE, typename TSwap, typename TType=uint8_t>
22     class /*GDCM_EXPORT*/ ValueIO
23     {
24     public:
25         static std::istream &Read(std::istream &is, Value& v, bool readvalues);
26
27         static const std::ostream &Write(std::ostream &os, const Value& v);
28     };
29
30 } // end namespace gdcm_ns
31
32 #include "gdcmValueIO.txx"
33
34 #endif //GDCMVALUEIO_H

```

## 11.189 gdcmVL.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>

```

Include dependency graph for gdcmVL.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::VL](#)  
*Value Length.*

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const VL &val)

## 11.190 gdcmVL.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVL_H
15 #define GDCMVL_H
16
17 #include "gdcmTypes.h"
18
19 #include <iostream>
20
21 namespace gdcm
22 {
23
24     class GDCM_EXPORT VL
25     {
26     public:
27         typedef uint32_t Type;
28         VL(uint32_t vl = 0) : ValueLength(vl) { }
29
30         // FIXME: ugly
31         static uint32_t GetVL32Max() { return 0xFFFFFFFF; }
32         static uint16_t GetVL16Max() { return 0xFFFF; }
33
34         bool IsUndefined()const {
35             return ValueLength == 0xFFFFFFFF;
36         }
37         void SetToUndefined() {
38             ValueLength = 0xFFFFFFFF;
39         }
40
41         bool IsOdd()const {
42             return !IsUndefined() && ValueLength % 2;
43         }
44
45         VL& operator+=(VL const &vl) {
46             ValueLength += vl.ValueLength;
47             return *this;
48         }
49         VL& operator++() {
50             ++ValueLength;
51             return *this;
52         }
53         VL operator++(int) {
54             uint32_t tmp(ValueLength);
55             ++ValueLength;
56             return tmp;
57         }
58
59         operator uint32_t ()const { return ValueLength; }
60
61         VL GetLength()const {
62             // VL cannot know it's length...well in implicit yes...
63             // TODO: need to check we cannot call this function from an Explicit element
64             return 4;
65         }
66
67         friend std::ostream& operator<<(std::ostream& os, const VL& vl);
68
69         // PURPOSELY not implemented (could not differentiate 16bits vs 32bits VL)
70         //friend std::istream& operator>>(std::istream& is, VL& n);
71
72         template <typename TSwap>
73         std::istream &Read(std::istream &is)
74         {
75             is.read((char*)(&ValueLength), sizeof(uint32_t));
76             TSwap::SwapArray(&ValueLength,1);
77         }
78     };
79
80 }

```

```

84     return is;
85 }
86
87 template <typename TSwap>
88 std::istream &Read16(std::istream &is)
89 {
90     uint16_t copy;
91     is.read((char*)&copy, sizeof(uint16_t));
92     TSwap::SwapArray(&copy,1);
93     ValueLength = copy;
94     assert( ValueLength <= 65535 /*UINT16_MAX*/ ); // ?? doh !
95     return is;
96 }
97
98 template <typename TSwap>
99 const std::ostream &Write(std::ostream &os) const
100 {
101     uint32_t copy = ValueLength;
102     if( IsOdd() )
103     {
104         ++copy;
105     }
106     TSwap::SwapArray(&copy,1);
107     return os.write((char*)&copy, sizeof(uint32_t));
108 }
109
110 template <typename TSwap>
111 const std::ostream &Write16(std::ostream &os) const
112 {
113     assert( ValueLength <= 65535 /*UINT16_MAX*/ );
114     uint16_t copy = (uint16_t)ValueLength;
115     if( IsOdd() )
116     {
117         ++copy;
118     }
119     TSwap::SwapArray(&copy,1);
120     return os.write((char*)&copy, sizeof(uint16_t));
121 }
122
123 private:
124     uint32_t ValueLength;
125 };
126 //-----
127 inline std::ostream& operator<<(std::ostream& os, const VL& val)
128 {
129     os << /*std::hex <<*/ val.ValueLength;
130     return os;
131 }
132
133 } // end namespace gdcm
134
135 #endif //GDCMVL_H

```

## 11.191 gdcmVM.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmVM.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::VM](#)

*Value Multiplicity Looking at the DICOMV3 dict only there is very few cases: 1 2 3 4 5 6 8 16 24 1-2 1-3 1-8 1-32 1-99 1-n 2-2n 2-n 3-3n 3-n.*

### Namespaces

- namespace [gdcm](#)

## Macros

- `#define TYPETOLENGTH(type, length)`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const VM &_val)`

### 11.191.1 Macro Definition Documentation

#### 11.191.1.1 TYPETOLENGTH

```
#define TYPETOLENGTH(
    type,
    length )
```

#### Value:

```
template<> struct VMToLength<VM::type> \
{ enum { Length = length }; };
```

## 11.192 gdcmVM.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVM_H
15 #define GDCMVM_H
16
17 #include "gdcmTypes.h"
18 #include <iostream>
19
20 namespace gdcm
21 {
22
23     class GDCM_EXPORT VM
24     {
25     public:
26         typedef enum {
27             VM0 = 0, // aka the invalid VM
28             VM1 = 1,
29             VM2 = 2,
30             VM3 = 4,
31             VM4 = 8,
32             VM5 = 16,
33             VM6 = 32,
```

```

78     VM8 = 64,
79     VM9 = 128,
80     VM10 = 256,
81     VM12 = 512, //1024,
82     VM16 = 1024, //2048,
83     VM18 = 2048, //4096,
84     VM24 = 4096, //8192,
85     VM28 = 8192, //16384,
86     VM32 = 16384, //32768,
87     VM35 = 32768, //65536,
88     VM99 = 65536, //131072,
89     VM256 = 131072, //262144,
90     VM1_2 = VM1 | VM2,
91     VM1_3 = VM1 | VM2 | VM3,
92     VM1_4 = VM1 | VM2 | VM3 | VM4,
93     VM1_5 = VM1 | VM2 | VM3 | VM4 | VM5,
94     VM1_8 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8,
95 // The following need some work:
96     VM1_32 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32,
97     VM1_99 = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99,
98     VM1_n = VM1 | VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
99     VM2_2n = VM2 | VM4 | VM6 | VM8 | VM16 | VM24 | VM32 | VM99 | VM256,
100    VM2_n = VM2 | VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
101    VM3_4 = VM3 | VM4,
102    VM3_3n = VM3 | VM6 | VM9 | VM24 | VM99 | VM256,
103    VM3_n = VM3 | VM4 | VM5 | VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
104    VM4_4n = VM4 | VM16 | VM24 | VM32 | VM256,
105    VM6_6n = VM6 | VM12 | VM18 | VM24 | VM99 | VM256,
106    VM6_n = VM6 | VM8 | VM9 | VM16 | VM24 | VM32 | VM99 | VM256,
107    VM7_7n,
108    VM30_30n,
109    VM47_47n,
110    VM_END = VM1_n + 1 // Custom tag to count number of entry
111 } VMType;
112
113 static const char* GetVMString(VMType vm);
114 static VMType GetVMType(const char *vm);
115
116 static bool IsValid(int vm1, VMType vm2);
117 //bool IsValid() { return VMField != VM0 && VMField < VM_END; }
118
119 bool Compatible(VM const &vm) const;
120
121 static VMType GetVMTypeFromLength(size_t length, unsigned int size);
122 static size_t GetNumberOfElementsFromArray(const char *array, size_t length);
123
124 VM(VMType type = VM0):VMField(type) {}
125 operator VMType ()const { return VMField; }
126 unsigned int GetLength() const;
127
128 friend std::ostream &operator<<(std::ostream &os, const VM &vm);
129 protected:
130     static unsigned int GetIndex(VMType vm);
131
132 private:
133     VMType VMField;
134 };
135 //-----
136 inline std::ostream& operator<<(std::ostream& _os, const VM &_val)
137 {
138     assert( VM::GetVMString(_val) );
139     _os << VM::GetVMString(_val);
140     return _os;
141 }
142
143 //template <int TVM> struct LengthToVM;
144 //template <> struct LengthToVM<1>
145 //{ enum { TVM = VM::VM1 }; };
146
147 template<int T> struct VMToLength;
148 #define TYPETOLENGTH(type,length) \
149 template<> struct VMToLength<VM::type> \
150 { enum { Length = length }; };
151 // TODO: Could be generated from XML file
152 //TYPETOLENGTH(VM0,1)
153 TYPETOLENGTH(VM1,1)
154 TYPETOLENGTH(VM2,2)
155 TYPETOLENGTH(VM3,3)
156 TYPETOLENGTH(VM4,4)
157 TYPETOLENGTH(VM5,5)
158 TYPETOLENGTH(VM6,6)

```



```

167 TYPETOLENGTH (VM8, 8)
168 TYPETOLENGTH (VM9, 9)
169 TYPETOLENGTH (VM10, 10)
170 TYPETOLENGTH (VM12, 12)
171 TYPETOLENGTH (VM16, 16)
172 TYPETOLENGTH (VM18, 18)
173 TYPETOLENGTH (VM24, 24)
174 TYPETOLENGTH (VM28, 28)
175 TYPETOLENGTH (VM32, 32)
176 TYPETOLENGTH (VM35, 35)
177 TYPETOLENGTH (VM99, 99)
178 TYPETOLENGTH (VM256, 256)
179 //TYPETOLENGTH (VM1_2, 2)
180 //TYPETOLENGTH (VM1_3, 3)
181 //TYPETOLENGTH (VM1_8, 8)
182 //TYPETOLENGTH (VM1_32, 32)
183 //TYPETOLENGTH (VM1_99, 99)
184 //TYPETOLENGTH (VM1_n,
185 //TYPETOLENGTH (VM2_2n,
186 //TYPETOLENGTH (VM2_n,
187 //TYPETOLENGTH (VM3_3n,
188 //TYPETOLENGTH (VM3_n,
189
190 } // end namespace gdcm
191
192 #endif //GDCMVM_H

```

## 11.193 gdcmVR.h File Reference

```

#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "gdcmString.h"
#include <iostream>
#include <fstream>
#include <assert.h>

```

Include dependency graph for gdcmVR.h: This graph shows which files directly or indirectly include this file:

### Classes

- struct [gdcm::UI](#)
- class [gdcm::VR](#)  
*VR class.*

### Namespaces

- namespace [gdcm](#)

### Macros

- #define [TYPETOENCODING](#)(type, rep, rtype)
- #define [VRTypeTemplateCase](#)(type)

## Typedefs

- typedef String<'\', 16 > [gdcm::AECComp](#)
- typedef String<'\', 64 > [gdcm::ASComp](#)
- typedef String<'\', 16 > [gdcm::CSComp](#)
- typedef String<'\', 64 > [gdcm::DAComp](#)
- typedef String<'\', 64 > [gdcm::DTComp](#)
- typedef String<'\', 64 > [gdcm::LOComp](#)
- typedef String<'\', 64 > [gdcm::LTComp](#)
- typedef String<'\', 64 > [gdcm::PNComp](#)
- typedef String<'\', 64 > [gdcm::SHComp](#)
- typedef String<'\', 64 > [gdcm::STComp](#)
- typedef String<'\', 16 > [gdcm::TMComp](#)
- typedef String<'\', 4294967294 > [gdcm::UCComp](#)
- typedef String<'\', 64, 0 > [gdcm::UIComp](#)
- typedef String<'\', 4294967294 > [gdcm::URComp](#)
- typedef String<'\', 64 > [gdcm::UTComp](#)

## Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &\_os, const UI &\_val)
- std::ostream & [gdcm::operator<<](#) (std::ostream &\_os, const VR &val)
- [gdcm::TYPETOENCODING](#) (SQ, VRBINARY, unsigned char) TYPETOENCODING(UN

## Variables

- [gdcm::VRBINARY](#)

## 11.193.1 Macro Definition Documentation

### 11.193.1.1 TYPETOENCODING

```
#define TYPETOENCODING(
    type,
    rep,
    rtype )
```

#### Value:

```
template<> struct VRToEncoding<VR::type> \
{ enum:long long { Mode = VR::rep }; }; \
template<> struct VRToType<VR::type> \
{ typedef rtype Type; };
```

## 11.193.1.2 VRTypeTemplateCase

```
#define VRTypeTemplateCase(
    type )
```

**Value:**

```
case VR::type: \
    return sizeof ( VRToType<VR::type>::Type );
```

## 11.194 gdcmVR.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVR_H
15 #define GDCMVR_H
16
17 #include "gdcmTag.h"
18 #include "gdcmTrace.h"
19 #include "gdcmString.h"
20
21 #include <iostream>
22 #include <fstream>
23 #include <assert.h>
24
25 //these defines are here to ensure compilation on sunos gcc
26 #if defined (CS)
27 # undef CS
28 #endif
29 #if defined (DS)
30 # undef DS
31 #endif
32 #if defined (SS)
33 # undef SS
34 #endif
35
36
37 namespace gdcm
38 {
39
40 class GDCM_EXPORT VR
41 {
42 public:
43     enum VRType : long long {
44         // Warning: Do not write if ( vr & VR::INVALID ) but if ( vr == VR::INVALID )
45         INVALID = 0, // For Item/(Seq) Item Delimitation Item
46         AE = 1,
47         AS = 2,
48         AT = 4,
49         CS = 8,
50         DA = 16,
51         DS = 32,
52         DT = 64,
53         FD = 128,
54         FL = 256,
55         IS = 512,
56         LO = 1024,
57         LT = 2048,
58         OB = 4096,
59         OD = 134217728, // 2^27
60         OF = 8192,
```

```

75     OL = 268435456, // 2^28
76     OV = 2147483648, // 2^31
77     OW = 16384,
78     PN = 32768,
79     SH = 65536,
80     SL = 131072,
81     SQ = 262144,
82     SS = 524288,
83     ST = 1048576,
84     SV = 4294967296, // 2^32
85     TM = 2097152,
86     UC = 536870912, // 2^29
87     UI = 4194304,
88     UL = 8388608,
89     UN = 16777216,
90     UR = 1073741824, // 2^30
91     US = 33554432,
92     UT = 67108864,
93     UV = 8589934592, // 2^33
94     OB_OW = OB | OW,
95     US_SS = US | SS,
96     US_SS_OW = US | SS | OW,
97     US_OW = US | OW,
98     // The following do not have a VRString equivalent (ie cannot be found in PS 3.6)
99     VL16 = AE | AS | AT | CS | DA | DS | DT | FD | FL | IS | LO | LT | PN | SH | SL | SS | ST | TM | UI | UL
100    | US, // if( VR & VL16 ) => VR has its VL coded over 16bits
101    VL32 = OB | OW | OD | OF | OL | OV | SQ | SV | UC | UN | UR | UT | UV, // if( VR & VL32 ) => VR has its
    VL coded over 32bits
102    VRSCII = AE | AS | CS | DA | DS | DT | IS | LO | LT | PN | SH | ST | TM | UC | UI | UR | UT,
103    VRBINARY = AT | FL | FD | OB | OD | OF | OL | OV | OW | SL | SQ | SS | SV | UL | UN | US | UV, // FIXME:
    UN ?
104    // PS 3.5:
105    // Data Elements with a VR of SQ, OD, OF, OL, OW, OB or UN shall always have a Value Multiplicity of
    one.
106    // GDCM is adding a couple more: AS, LT, ST, UT
107    VR_VM1 = AS | LT | ST | UT | SQ | OF | OL | OV | OD | OW | OB | UN, // All those VR have a VM1
108    VRALL = VRSCII | VRBINARY,
109    VR_END = UV+1 // Invalid VR, need to be max(VRType)+1
110 };
111 static const char *GetVRString(VRType vr);
112
113 // This function will only look at the very first two chars nothing else
114 static VRType GetTypeFromFile(const char *vr);
115
116 // You need to make sure end of string is \0
117 static VRType GetType(const char *vr);
118 static const char *GetVRStringFromFile(VRType vr);
119
120 static bool IsValid(const char *vr);
121 // Check if vrl is valid against vr2,
122 // Typically vrl is read from the file and vr2 is taken from the dict
123 static bool IsValid(const char *vrl, VRType vr2);
124 //static bool IsValid(const VRType &vrl, const VRType &vr2);
125 // Find out if the string read is byte swapped
126 static bool IsSwap(const char *vr);
127
128 // Size read on disk
129 // FIXME: int ?
130 int GetLength()const {
131     return VR::GetLength(VRField);
132 }
133 unsigned int GetSizeof() const;
134 static uint32_t GetLength(VRType vr) {
135     //if( vr == VR::INVALID ) return 4;
136     if( vr & VL32 )
137     {
138         return 4;
139     }
140     else
141         return 2;
142 }
143
144 // Some use of template metaprograming with ugly macro
145 static bool IsBinary(VRType vr);
146 static bool IsASCII(VRType vr);
147 // TODO: REMOVE ME
148 static bool CanDisplay(VRType vr);
149 // TODO: REMOVE ME
150 static bool IsBinary2(VRType vr);
151 // TODO: REMOVE ME

```

```

152 static bool IsASCII2(VRType vr);
153
154 VR(VRType vr = INVALID):VRField(vr) { }
155 //VR(VR const &vr):VRField(vr.VRField) { }
156 std::istream &Read(std::istream &is)
157 {
158     char vr[2];
159     is.read(vr, 2);
160     VRField = GetVRTypeFromFile(vr);
161     assert( VRField != VR::VR_END );
162     if( VRField == VR::INVALID )
163     {
164         // \0\2 Data/TherapysGDCM120Bug.dcm
165         // \0\0
166         Data/MR_Philips_Intera_PrivateSequenceExplicitVR_in_SQ_2001_e05f_item_wrong_lgt_use_NOSHADOWSEQ.dcm
167         // \0\4 Data/BugGDCM2_UndefItemWrongVL.dcm
168         // \44\0 Data/gdcm-MR-PHILIPS-16-Multi-Seq.dcm
169         // \0\20 Data/ExplicitVRforPublicElementsImplicitVRforShadowElements.dcm
170         // \0\3 Data/DMCPACS_ExplicitImplicit_BogusIOP.dcm
171         // \0\4 Data/THERALYS-12-MONO2-Uncompressed-Even_Length_Tag.dcm
172         // \0\4 Data/PrivateGEImplicitVRBigEndianTransferSyntax16Bits.dcm
173         // \0\4 Data/GE_DLX-8-MONO2-PrivateSyntax.dcm
174         throw Exception( "INVALID VR" );
175     }
176     if( VRField & VL32 )
177     {
178         #if 0
179             // For some reason this seems slower on my linux box...
180             is.seekg(2, std::ios::cur );
181         #else
182             char dum[2];
183             is.read(dum, 2);
184             if( !(dum[0] == 0 && dum[1] == 0 ) )
185             {
186                 // JDDICOM_Sample4.dcm
187                 gdcmDebugMacro( "32bits VR contains non zero bytes. Skipped" );
188             }
189         #endif
190     }
191     return is;
192 }
193
194 const std::ostream &Write(std::ostream &os) const
195 {
196     VRType vrfield = VRField;
197     gdcmAssertAlwaysMacro( !IsDual() );
198     if( vrfield == VR::INVALID )
199     {
200         //vrfield = VR::UN;
201     }
202     const char *vr = GetVRString(vrfield);
203     //assert( strlen( vr ) == 2 );
204     assert( vr[0] && vr[1] && vr[2] == 0 );
205     os.write(vr, 2);
206     // See PS 3.5, Data Element Structure With Explicit VR
207     if( vrfield & VL32 )
208     {
209         const char dum[2] = {0, 0};
210         os.write(dum,2);
211     }
212     return os;
213 }
214
215 friend std::ostream &operator<<(std::ostream &os, const VR &vr);
216
217 operator VRType ()const { return VRField; }
218
219 unsigned int GetSize() const;
220
221 bool Compatible(VR const &vr) const;
222
223 bool IsVRFile() const;
224
225 bool IsDual() const;
226
227 private:
228     // Internal function that map a VRType to an index in the VRStrings table
229     static unsigned int GetIndex(VRType vr);
230     VRType VRField;
231 };
232
233 //-----
234 inline std::ostream &operator<<(std::ostream &_os, const VR &val)

```

```

232 {
233     //_os « VR::GetVRStringFromFile(val.VRField);
234     _os « VR::GetVRString(val.VRField);
235     return _os;
236 }
237
238 // Apparently SWIG is not happy with something, somewhere below...
239 #ifndef SWIG
240
241 // Tells whether VR Type is ASCII or Binary
242 template<long long T> struct VRToEncoding;
243 // Convert from VR Type to real underlying type
244 template<long long T> struct VRToType;
245 #define TYPETOENCODING(type,rep, rtype) \
246 template<> struct VRToEncoding<VR::type> \
247 { enum:long long { Mode = VR::rep }; }; \
248 template<> struct VRToType<VR::type> \
249 { typedef rtype Type; };
250
251
252 // Do not use me
253 struct UI { char Internal[64+1];
254     friend std::ostream& operator<<(std::ostream &_os, const UI &_val);
255 };
256 inline std::ostream& operator<<(std::ostream &_os, const UI &_val)
257 {
258     _os << _val.Internal;
259     return _os;
260 }
261
262 typedef String<'\\',16> AECComp;
263 typedef String<'\\',64> ASCComp;
264 typedef String<'\\',16> CSCComp;
265 typedef String<'\\',64> DACComp;
266 typedef String<'\\',64> DTCComp;
267 typedef String<'\\',64> LOCComp;
268 typedef String<'\\',64> LTCComp;
269 typedef String<'\\',64> PNCComp;
270 typedef String<'\\',64> SHComp;
271 typedef String<'\\',64> STComp;
272 typedef String<'\\',4294967294> UCCComp;
273 typedef String<'\\',4294967294> URComp;
274 typedef String<'\\',16> TMCComp;
275 typedef String<'\\',64,0> UICComp;
276 typedef String<'\\',64> UTCComp;
277
278
279 // TODO: Could be generated from XML file
280 TYPETOENCODING(AE,VRASCII ,AECComp)
281 TYPETOENCODING(AS,VRASCII ,ASCComp)
282 TYPETOENCODING(AT,VRBINARY,Tag)
283 TYPETOENCODING(CS,VRASCII ,CSCComp)
284 TYPETOENCODING(DA,VRASCII ,DACComp)
285 TYPETOENCODING(DS,VRASCII ,double)
286 TYPETOENCODING(DT,VRASCII ,DTCComp)
287 TYPETOENCODING(FL,VRBINARY,float)
288 TYPETOENCODING(FD,VRBINARY,double)
289 TYPETOENCODING(IS,VRASCII ,int32_t)
290 TYPETOENCODING(LO,VRASCII ,LOCComp)
291 TYPETOENCODING(LT,VRASCII ,LTCComp)
292 TYPETOENCODING(OB,VRBINARY,uint8_t)
293 TYPETOENCODING(OD,VRBINARY,double)
294 TYPETOENCODING(OF,VRBINARY,float)
295 TYPETOENCODING(OL,VRBINARY,uint32_t)
296 TYPETOENCODING(OV,VRBINARY,uint64_t)
297 TYPETOENCODING(OW,VRBINARY,uint16_t)
298 TYPETOENCODING(PN,VRASCII ,PNCComp)
299 TYPETOENCODING(SH,VRASCII ,SHComp)
300 TYPETOENCODING(SL,VRBINARY,int32_t)
301 TYPETOENCODING(SQ,VRBINARY,unsigned char) // FIXME
302 TYPETOENCODING(SS,VRBINARY,int16_t)
303 TYPETOENCODING(ST,VRASCII ,STComp)
304 TYPETOENCODING(SV,VRBINARY,int64_t)
305 TYPETOENCODING(TM,VRASCII ,TMCComp)
306 TYPETOENCODING(UC,VRASCII ,UCCComp)
307 TYPETOENCODING(UI,VRASCII ,UICComp)
308 TYPETOENCODING(UL,VRBINARY,uint32_t)
309 TYPETOENCODING(UN,VRBINARY,uint8_t) // FIXME ?
310 TYPETOENCODING(UR,VRASCII ,URComp)
311 TYPETOENCODING(US,VRBINARY,uint16_t)
312 TYPETOENCODING(UT,VRASCII ,UTCComp)

```

```

313 TYPETOENCODING(UV, VRBINARY, uint64_t)
314
315 #define VRTypeTemplateCase(type) \
316 case VR::type: \
317 return sizeof ( VRToType<VR::type>::Type );
318
319 inline unsigned int VR::GetSize() const
320 {
321     switch (VRField)
322     {
323         VRTypeTemplateCase(AE)
324         VRTypeTemplateCase(AS)
325         VRTypeTemplateCase(AT)
326         VRTypeTemplateCase(CS)
327         VRTypeTemplateCase(DA)
328         VRTypeTemplateCase(DS)
329         VRTypeTemplateCase(DT)
330         VRTypeTemplateCase(FL)
331         VRTypeTemplateCase(FD)
332         VRTypeTemplateCase(IS)
333         VRTypeTemplateCase(LO)
334         VRTypeTemplateCase(LT)
335         VRTypeTemplateCase(OB)
336         VRTypeTemplateCase(OD)
337         VRTypeTemplateCase(OF)
338         VRTypeTemplateCase(OL)
339         VRTypeTemplateCase(OV)
340         VRTypeTemplateCase(OW)
341         VRTypeTemplateCase(PN)
342         VRTypeTemplateCase(SH)
343         VRTypeTemplateCase(SL)
344         VRTypeTemplateCase(SQ)
345         VRTypeTemplateCase(SS)
346         VRTypeTemplateCase(ST)
347         VRTypeTemplateCase(SV)
348         VRTypeTemplateCase(TM)
349         VRTypeTemplateCase(UC)
350         VRTypeTemplateCase(UI)
351         VRTypeTemplateCase(UL)
352         VRTypeTemplateCase(UN)
353         VRTypeTemplateCase(UR)
354         VRTypeTemplateCase(US)
355         VRTypeTemplateCase(UT)
356         VRTypeTemplateCase(UV)
357         case VR::US_SS:
358             return 2;
359
360         case VR::INVALID:
361         case VR::OB_OW:
362         case VR::US_SS_OW:
363         case VR::US_OW:
364         case VR::VL16:
365         case VR::VL32:
366         case VR::VRASCII:
367         case VR::VRBINARY:
368         case VR::VR_VM1:
369         case VR::VRALL:
370         case VR::VR_END:
371         default:
372             assert( 0 && "should not" );
373     }
374     return 0;
375 }
376 #endif // SWIG
377
378
379 } // end namespace gdcm
380
381 #endif //GDCMVR_H

```

## 11.195 gdcmVR16ExplicitDataElement.h File Reference

```

#include "gdcmDataElement.h"
#include "gdcmVR16ExplicitDataElement.txx"

```

Include dependency graph for gdcmVR16ExplicitDataElement.h:

## Classes

- class [gdcm::VR16ExplicitDataElement](#)  
Class to read/write a [DataElement](#) as Explicit Data [Element](#).

## Namespaces

- namespace [gdcm](#)

## 11.196 gdcmVR16ExplicitDataElement.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVR16EXPLICITDATAELEMENT_H
15 #define GDCMVR16EXPLICITDATAELEMENT_H
16
17 #include "gdcmDataElement.h"
18
19 namespace gdcm
20 {
21     // Data Element (Explicit)
22     class GDCM_EXPORT VR16ExplicitDataElement : public DataElement
23     {
24     public:
25         VL GetLength() const;
26
27         template <typename TSwap>
28         std::istream &Read(std::istream &is);
29
30         template <typename TSwap>
31         std::istream &ReadPreValue(std::istream &is);
32
33         template <typename TSwap>
34         std::istream &ReadValue(std::istream &is, bool readvalues = true);
35
36         template <typename TSwap>
37         std::istream &ReadWithLength(std::istream &is, VL &length);
38
39         // PURPOSELY do not provide an implementation for writing !
40         //template <typename TSwap>
41         //const std::ostream &Write(std::ostream &os) const;
42     };
43
44 } // end namespace gdcm
45
46 #include "gdcmVR16ExplicitDataElement.txx"
47
48 #endif //GDCMVR16EXPLICITDATAELEMENT_H

```

## 11.197 gdcmWriter.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmWriter.h: This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Writer](#)  
*Writer ala DOM (Document Object Model)*

## Namespaces

- namespace [gdcm](#)

## 11.198 gdcmWriter.h

[Go to the documentation of this file.](#)

```

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2
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMWRITER_H
16 #define GDCMWRITER_H
17
18 #include "gdcmFile.h"
19
20 namespace gdcm
21 {
22
23 class FileMetaInformation;
24 class GDCM_EXPORT Writer
25 {
26 public:
27     Writer();
28     virtual ~Writer();
29
30     virtual bool Write(); // Execute()
31
32     void SetFileName(const char *filename_native);
33
34     void SetStream(std::ostream &output_stream) {
35         Stream = &output_stream;
36     }
37
38     void SetFile(const File& f) { F = f; }
39     File &GetFile() { return *F; }
40
41     void SetCheckFileMetaInformation(bool b) { CheckFileMetaInformation = b; }
42     void CheckFileMetaInformationOff() { CheckFileMetaInformation = false; }
43     void CheckFileMetaInformationOn() { CheckFileMetaInformation = true; }
44
45 protected:
46     void SetWriteDataSetOnly(bool b) { WriteDataSetOnly = b; }
47
48 protected:
49     friend class StreamImageWriter;
50     //this function is added for the StreamImageWriter, which needs to write
51     //up to the pixel data and then stops right before writing the pixel data.
52     //after that, for the raw codec at least, zeros are written for the length of the data
53     std::ostream* GetStreamPtr()const { return Stream; }
54
55 protected:
56     std::ostream *Stream;
57     std::ofstream *Ofstream;
58
59 }
60
61 #endif

```

```

87  bool GetCheckFileMetaInformation() const { return CheckFileMetaInformation; }
88
89 private:
90  SmartPointer<File> F;
91  bool CheckFileMetaInformation;
92  bool WriteDataSetOnly;
93 };
94
95 } // end namespace gdcM
96
97 #endif //GDCMWRITER_H

```

## 11.199 gdcMDefinedTerms.h File Reference

```
#include "gdcMTypes.h"
```

Include dependency graph for gdcMDefinedTerms.h:

### Classes

- class [gdcM::DefinedTerms](#)

*Defined Terms are used when the specified explicit Values may be extended by implementors to include additional new Values. These new Values shall be specified in the Conformance Statement (see PS 3.2) and shall not have the same meaning as currently defined Values in this standard. A Data [Element](#) with Defined Terms that does not contain a [Value](#) equivalent to one of the Values currently specified in this standard shall not be considered to have an invalid value. Note: Interpretation [Type](#) ID (4008,0210) is an example of a Data [Element](#) having Defined Terms. It is defined to have a [Value](#) that may be one of the set of standard Values; REPORT or AMENDMENT (see PS 3.3). Because this Data [Element](#) has Defined Terms other Interpretation [Type](#) IDs may be defined by the implementor.*

### Namespaces

- namespace [gdcM](#)

## 11.200 gdcMDefinedTerms.h

[Go to the documentation of this file.](#)

```

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2
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDEFINEDTERMS_H
15 #define GDCMDEFINEDTERMS_H
16
17 #include "gdcMTypes.h"
18
19 namespace gdcM
20 {
21     class GDCM_EXPORT DefinedTerms
22     {
23     public:
24         DefinedTerms() = default;
25     private:
26     };
27
28 } // end namespace gdcM
29
30 #endif //GDCMDEFINEDTERMS_H

```

## 11.201 gdcmDefs.h File Reference

```
#include "gdcmModules.h"
#include "gdcmMacros.h"
#include "gdcmIODs.h"
#include <string>
```

Include dependency graph for gdcmDefs.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Defs](#)

*FIXME I do not like the name 'Defs'.*

### Namespaces

- namespace [gdcm](#)

## 11.202 gdcmDefs.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDEFS_H
15 #define GDCMDEFS_H
16
17 #include "gdcmModules.h"
18 #include "gdcmMacros.h"
19 #include "gdcmIODs.h"
20
21 #include <string>
22
23 namespace gdcm
24 {
25     class DataSet;
26     class File;
27     class MediaStorage;
28     class GDCM_EXPORT Defs
29     {
30     public:
31         Defs();
32         ~Defs();
33         Defs &operator=(const Defs &val) = delete;
34         Defs(const Defs &val) = delete;
35
36         const Modules &GetModules()const { return Part3Modules; }
37         Modules &GetModules() { return Part3Modules; }
38
39         const Macros &GetMacros()const { return Part3Macros; }
40         Macros &GetMacros() { return Part3Macros; }
41
42         const IODs &GetIODs()const { return Part3IODs; }
43     };
44 }
```

```

49  IODs & GetIODs() { return Part3IODs; }
50
51  bool IsEmpty()const { return GetModules().IsEmpty(); }
52
53  bool Verify(const File& file) const;
54
55  // \deprecated DO NOT USE
56  bool Verify(const DataSet& ds) const;
57
58  Type GetTypeFromTag(const File& file, const Tag& tag) const;
59
60  static const char *GetIODNameFromMediaStorage(MediaStorage const &ms);
61
62  const IOD& GetIODFromFile(const File& file) const;
63
64 protected:
65     friend class Global;
66     void LoadDefaults();
67     void LoadFromFile(const char *filename);
68
69 private:
70     // Part 3 stuff:
71     Macros Part3Macros;
72     Modules Part3Modules;
73     IODs Part3IODs;
74
75 };
76
77
78 } // end namespace gdcm
79
80 #endif //GDCMDEFS_H

```

## 11.203 gdcmEnumeratedValues.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmEnumeratedValues.h:

### Classes

- class [gdcm::EnumeratedValues](#)

*Element.* A Data [Element](#) with Enumerated Values that does not have a [Value](#) equivalent to one of the Values specified in this standard has an invalid value within the scope of a specific Information Object/SOP Class definition. Note:

### Namespaces

- namespace [gdcm](#)

## 11.204 gdcmEnumeratedValues.h

[Go to the documentation of this file.](#)

```

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2
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8

```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMENUMERATEDVALUES_H
15 #define GDCMENUMERATEDVALUES_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT EnumeratedValues
22     {
23     public:
24         EnumeratedValues() = default;
25     private:
26     };
27
28 } // end namespace gdcm
29
30 #endif //GDCMENUMERATEDVALUES_H

```

## 11.205 gdcmIOD.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmIODEntry.h"
#include <vector>

```

Include dependency graph for gdcmIOD.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::IOD](#)  
*Class for representing a IOD.*

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &\_os, const IOD &\_val)

## 11.206 gdcmIOD.h

[Go to the documentation of this file.](#)

```

1  /*=====
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIOD_H
15 #define GDCMIOD_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTag.h"
19 #include "gdcmIODEntry.h"
20
21 #include <vector>
22
23 namespace gdcm
24 {
25 class DataSet;
26 class Defs;
27
28 class GDCM_EXPORT IOD
29 {
30 public:
31     typedef std::vector<IODEntry> MapIODEntry;
32     typedef MapIODEntry::size_type SizeType;
33
34     IOD() = default;
35     friend std::ostream& operator<<(std::ostream& _os, const IOD &_val);
36
37     void Clear() { IODInternal.clear(); }
38
39     void AddIODEntry(const IODEntry &iode)
40     {
41         IODInternal.push_back(iode);
42     }
43
44     SizeType GetNumberOfIODs()const {
45         return IODInternal.size();
46     }
47
48     const IODEntry& GetIODEntry(SizeType idx)const
49     {
50         return IODInternal[idx];
51     }
52
53     Type GetTypeFromTag(const Defs &defs, const Tag& tag) const;
54 private:
55     //IOD &operator=(const IOD &_val); // purposely not implemented
56     //IOD(const IOD &_val); // purposely not implemented
57     MapIODEntry IODInternal;
58 };
59
60 //-----
61 inline std::ostream& operator<<(std::ostream& _os, const IOD &_val)
62 {
63     IOD::MapIODEntry::const_iterator it = _val.IODInternal.begin();
64     for(; it != _val.IODInternal.end(); ++it)
65     {
66         _os << *it << '\n';
67     }
68     return _os;
69 }
70
71 } // end namespace gdcm
72
73 #endif //GDCMIOD_H

```

## 11.207 gdcmIODEntry.h File Reference

```
#include "gdcmUsage.h"
#include "gdcmType.h"
#include <string>
```

Include dependency graph for gdcmIODEntry.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::IODEntry](#)  
Class for representing a *IODEntry*.

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const IODEntry &_val)`

## 11.208 gdcmIODEntry.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIODENTRY_H
15 #define GDCMIODENTRY_H
16
17 #include "gdcmUsage.h"
18 #include "gdcmType.h"
19
20 #include <string>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT IODEntry
25     {
26     public:
27         IODEntry(const char *name = "", const char *ref = "", const char *usag =
            ""):Name(name),Ref(ref),usage(usag) {
28         }
29         friend std::ostream& operator<<(std::ostream& _os, const IODEntry &_val);
30
31         void SetIE(const char *ie) { IE = ie; }
32         const char *GetIE()const { return IE.c_str(); }
33
34         void SetName(const char *name) { Name = name; }
```

```

62  const char *GetName()const { return Name.c_str(); }
63
64  void SetRef(const char *ref) { Ref = ref; }
65  const char *GetRef()const { return Ref.c_str(); }
66
67  void SetUsage(const char *usag) { usage = usag; }
68  const char *GetUsage()const { return usage.c_str(); }
69  Usage::UsageType GetUsageType() const;
70
71 private:
72  std::string IE;
73
74  std::string Name;
75
76  std::string Ref;
77
78  std::string usage;
79 };
80 //-----
81 inline std::ostream& operator<<(std::ostream& _os, const IODEntry &_val)
82 {
83  _os << _val.IE << "\t" << _val.Name << "\t" << _val.Ref << "\t" << _val.usage;
84  return _os;
85 }
86
87 } // end namespace gdcmm
88
89 #endif //GDCMIODENTRY_H

```

## 11.209 gdcmlIODs.h File Reference

```

#include "gdcmmTypes.h"
#include "gdcmmIOD.h"
#include <map>

```

Include dependency graph for gdcmlIODs.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcmm::IODs](#)  
*Class for representing a IODs.*

### Namespaces

- namespace [gdcmm](#)

### Functions

- [std::ostream & gdcmm::operator<<](#) (std::ostream &\_os, const IODs &\_val)



## 11.210 gdcmIODs.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIODS_H
15 #define GDCMIODS_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmIOD.h"
19
20 #include <map>
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT IODs
26 {
27 public:
28     typedef std::string IODName;
29     typedef std::map<IODName, IOD> IODMapType;
30
31     IODs() = default;
32     friend std::ostream& operator<<(std::ostream& _os, const IODs &_val);
33
34     void Clear() { IODsInternal.clear(); }
35
36     void AddIOD(const char *name, const IOD & module)
37     {
38         IODsInternal.insert(
39             IODMapType::value_type(name, module));
40     }
41
42     const IOD &GetIOD(const char *name) const
43     {
44         //return IODsInternal[name];
45         IODMapType::const_iterator it = IODsInternal.find( name );
46         assert( it != IODsInternal.end() );
47         assert( it->first == name );
48         return it->second;
49     }
50
51     typedef IODMapType::const_iterator IODMapTypeConstIterator;
52     IODMapTypeConstIterator Begin() const { return IODsInternal.begin(); }
53     IODMapTypeConstIterator End() const { return IODsInternal.end(); }
54
55 private:
56     IODMapType IODsInternal;
57 };
58
59 //-----
60 inline std::ostream& operator<<(std::ostream& _os, const IODs &_val)
61 {
62     IODs::IODMapType::const_iterator it = _val.IODsInternal.begin();
63     for(; it != _val.IODsInternal.end(); ++it)
64     {
65         const std::string &name = it->first;
66         const IOD &m = it->second;
67         _os << name << " " << m << '\n';
68     }
69
70     return _os;
71 }
72
73 } // end namespace gdcm
74
75 #endif //GDCMIODS_H

```

## 11.211 gdcmMacro.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmMacroEntry.h"
#include <map>
#include <vector>
```

Include dependency graph for gdcmMacro.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Macro](#)  
*Class for representing a [Macro](#).*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Macro &_val)`

## 11.212 gdcmMacro.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMACRO_H
15 #define GDCMMACRO_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTag.h"
19 #include "gdcmMacroEntry.h"
20
21 #include <map>
22 #include <vector>
23
24 namespace gdcm
25 {
26
27 class DataSet;
28 class Usage;
29 class GDCM_EXPORT Macro
30 {
31 public:
32     typedef std::map<Tag, MacroEntry> MapModuleEntry;
```

```

40  typedef std::vector<std::string> ArrayIncludeMacrosType;
41
42  //typedef MapModuleEntry::const_iterator ConstIterator;
43  //typedef MapModuleEntry::iterator Iterator;
44  //ConstIterator Begin() const { return ModuleInternal.begin(); }
45  //Iterator Begin() { return ModuleInternal.begin(); }
46  //ConstIterator End() const { return ModuleInternal.end(); }
47  //Iterator End() { return ModuleInternal.end(); }
48
49  Macro() = default;
50  friend std::ostream& operator<<(std::ostream& _os, const Macro& _val);
51
52  void Clear() { ModuleInternal.clear(); }
53
54  void AddMacroEntry(const Tag& tag, const MacroEntry & module)
55  {
56      ModuleInternal.insert(
57          MapModuleEntry::value_type(tag, module));
58  }
59
60  bool FindMacroEntry(const Tag &tag) const;
61  const MacroEntry& GetMacroEntry(const Tag &tag) const;
62
63  void SetName( const char *name) { Name = name; }
64  const char *GetName()const { return Name.c_str(); }
65
66  // Verify will print on std::cerr for error
67  // Upon success will return true, false otherwise
68  bool Verify(const DataSet& ds, Usage const & usage) const;
69
70 private:
71  //Module &operator=(const Module &_val); // purposely not implemented
72  //Module(const Module &_val); // purposely not implemented
73
74  MapModuleEntry ModuleInternal;
75  std::string Name;
76 };
77
78 //-----
79 inline std::ostream& operator<<(std::ostream& _os, const Macro &_val)
80 {
81     _os << _val.Name << '\n';
82     Macro::MapModuleEntry::const_iterator it = _val.ModuleInternal.begin();
83     for(; it != _val.ModuleInternal.end(); ++it)
84     {
85         const Tag &t = it->first;
86         const MacroEntry &de = it->second;
87         _os << t << " " << de << '\n';
88     }
89     return _os;
90 }
91
92 // end namespace gdcmm
93
94 #endif //GDCMMACRO_H

```

## 11.213 gdcmmacroEntry.h File Reference

#include "gdcmmoduleEntry.h"

Include dependency graph for gdcmmacroEntry.h: This graph shows which files directly or indirectly include this file:

### Macros

- #define [GDCMMACROENTRY\\_H](#)

### 11.213.1 Macro Definition Documentation

### 11.213.1.1 GDCMMACROENTRY\_H

```
#define GDCMMACROENTRY_H
```

## 11.214 gdcMacroEntry.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #if 0
15 #ifndef GDCMMACROENTRY_H
16 #define GDCMMACROENTRY_H
17
18 #include "gdcTypes.h"
19 #include "gdcType.h"
20
21 #include <string>
22
23 namespace gdcm
24 {
25     class GDCM_EXPORT MacroEntry
26     {
27     public:
28         MacroEntry(const char *name = "", const char *type = "3", const char *description =
29             ""):Name(name),Type(type),DescriptionField(description) {
30             DataElementType = Type::GetTypeType(type);
31         }
32         virtual ~MacroEntry() {} // important
33         friend std::ostream& operator<<(std::ostream& _os, const MacroEntry &_val);
34
35         void SetName(const char *name) { Name = name; }
36         const char *GetName()const { return Name.c_str(); }
37
38         void SetType(const Type &type) { DataElementType = type; }
39         const Type &GetType()const { return DataElementType; }
40
41         /*
42         * WARNING: 'Description' is currently a std::string, but it might change in the future
43         * do not expect it to remain the same, and always use the ModuleEntry::Description typedef
44         * instead.
45         */
46         typedef std::string Description;
47         void SetDescription(const char *d) { DescriptionField = d; }
48         const Description & GetDescription()const { return DescriptionField; }
49
50     protected:
51         // PS 3.3 repeats the name of an attribute, but often contains typos
52         // for now we will not use this info, but instead access the DataDict instead
53         std::string Name;
54
55         // An attribute, encoded as a Data Element, may or may not be required in a
56         // Data Set, depending on that Attribute's Data Element Type.
57         Type DataElementType;
58
59         // TODO: for now contains the raw description (with enumerated values, defined terms...)
60         Description DescriptionField;
61     };
62
63     -----
64     inline std::ostream& operator<<(std::ostream& _os, const MacroEntry &_val)
65     {
66         _os << _val.Name << "\t" << _val.DataElementType << "\t" << _val.DescriptionField;
67         return _os;
68     }
```

```

71 }
72
73
74 } // end namespace gdcm
75
76 #endif //GDCMMODULEENTRY_H
77 #endif
78
79 #ifndef GDCMMACROENTRY_H
80 #define GDCMMACROENTRY_H
81 #include "gdcmModuleEntry.h"
82 #endif

```

## 11.215 gdcmMacros.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmMacro.h"
#include <map>

```

Include dependency graph for gdcmMacros.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Macros](#)  
Class for representing a *Modules*.

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Macros &_val)`

## 11.216 gdcmMacros.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMACROS_H
15 #define GDCMMACROS_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmMacro.h"

```

```

19
20 #include <map>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT Macros
25     {
26     public:
27         typedef std::map<std::string, Macro> ModuleMapType;
28
29         Macros() = default;
30         friend std::ostream& operator<<(std::ostream& _os, const Macros& _val);
31
32         void Clear() { ModulesInternal.clear(); }
33
34         // A Module is inserted based on it's ref
35         void AddMacro(const char *ref, const Macro & module )
36         {
37             assert( ref && *ref );
38             assert( ModulesInternal.find( ref ) == ModulesInternal.end() );
39             ModulesInternal.insert(
40                 ModuleMapType::value_type(ref, module));
41         }
42         const Macro &GetMacro(const char *name) const
43         {
44             assert( name && *name );
45             ModuleMapType::const_iterator it = ModulesInternal.find( name );
46             assert( it != ModulesInternal.end() );
47             assert( it->first == name );
48             return it->second;
49         }
50
51         bool IsEmpty() const { return ModulesInternal.empty(); }
52
53     private:
54         ModuleMapType ModulesInternal;
55     };
56
57     //-----
58     inline std::ostream& operator<<(std::ostream& _os, const Macros &_val)
59     {
60         Macros::ModuleMapType::const_iterator it = _val.ModulesInternal.begin();
61         for(; it != _val.ModulesInternal.end(); ++it)
62         {
63             const std::string &name = it->first;
64             const Macro &m = it->second;
65             _os << name << " " << m << '\n';
66         }
67
68         return _os;
69     }
70
71 } // end namespace gdcm
72 #endif //GDCMMODULES_H

```

## 11.217 gdcmModule.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmTag.h"
#include "gdcmModuleEntry.h"
#include <map>
#include <vector>

```

Include dependency graph for gdcmModule.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Module](#)  
Class for representing a *Module*.

## Namespaces

- namespace `gdcm`

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Module &_val)`

## 11.218 gdcmModule.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMODULE_H
15 #define GDCMMODULE_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTag.h"
19 #include "gdcmModuleEntry.h"
20
21 #include <map>
22 #include <vector>
23
24 namespace gdcm
25 {
26
27 class DataSet;
28 class Usage;
29 class Macros;
30 class GDCM_EXPORT Module
31 {
32 public:
33     typedef std::map<Tag, ModuleEntry> MapModuleEntry;
34     typedef std::vector<std::string> ArrayIncludeMacrosType;
35
36     //typedef MapModuleEntry::const_iterator ConstIterator;
37     //typedef MapModuleEntry::iterator Iterator;
38     //ConstIterator Begin() const { return ModuleInternal.begin(); }
39     //Iterator Begin() { return ModuleInternal.begin(); }
40     //ConstIterator End() const { return ModuleInternal.end(); }
41     //Iterator End() { return ModuleInternal.end(); }
42
43     Module() = default;
44     friend std::ostream& operator<<(std::ostream& _os, const Module &_val);
45
46     void Clear() { ModuleInternal.clear(); }
47
48     void AddModuleEntry(const Tag& tag, const ModuleEntry & module)
49     {
50         ModuleInternal.insert(
51             MapModuleEntry::value_type(tag, module));
52     }
53
54     void AddMacro(const char *include)
55     {
56         ArrayIncludeMacros.push_back( include );
57     }
58
59     bool FindModuleEntryInMacros(Macros const &macros, const Tag &tag) const;

```

```

70  const ModuleEntry& GetModuleEntryInMacros(Macros const &macros, const Tag &tag) const;
71
72  void SetName( const char *name) { Name = name; }
73  const char *GetName()const { return Name.c_str(); }
74
75  // Verify will print on std::cerr for error
76  // Upon success will return true, false otherwise
77  bool Verify(const DataSet& ds, Usage const & usage) const;
78
79 private:
80  //Module &operator=(const Module &_val); // purposely not implemented
81  //Module(const Module &_val); // purposely not implemented
82
83  MapModuleEntry ModuleInternal;
84  std::string Name;
85  ArrayIncludeMacrosType ArrayIncludeMacros;
86 };
87 //-----
88 inline std::ostream& operator<<(std::ostream& _os, const Module &_val)
89 {
90  _os << _val.Name << '\n';
91  Module::MapModuleEntry::const_iterator it = _val.ModuleInternal.begin();
92  for(;it != _val.ModuleInternal.end(); ++it)
93  {
94      const Tag &t = it->first;
95      const ModuleEntry &de = it->second;
96      _os << t << " " << de << '\n';
97  }
98
99  return _os;
100 }
101
102 } // end namespace gdcm
103
104 #endif //GDCMMODULE_H

```

## 11.219 gdcmModuleEntry.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmType.h"
#include <string>

```

Include dependency graph for gdcmModuleEntry.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::ModuleEntry](#)  
Class for representing a [ModuleEntry](#).

### Namespaces

- namespace [gdcm](#)

### Typedefs

- typedef ModuleEntry [gdcm::MacroEntry](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &\_os, const ModuleEntry &\_val)



## 11.220 gdcmModuleEntry.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMODULEENTRY_H
15 #define GDCMMODULEENTRY_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmType.h"
19
20 #include <string>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT ModuleEntry
25     {
26     public:
27         ModuleEntry(const char *name = "", const char *type = "3", const char *description =
            ""):Name(name)/*,Type(type)*/,DescriptionField(description) {
28             DataElementType = Type::GetTypeType(type);
29         }
30         virtual ~ModuleEntry() = default; // important
31         friend std::ostream& operator<<(std::ostream& _os, const ModuleEntry &_val);
32
33         void SetName(const char *name) { Name = name; }
34         const char *GetName()const { return Name.c_str(); }
35
36         void SetType(const Type &type) { DataElementType = type; }
37         const Type &GetType()const { return DataElementType; }
38
39         /*
40         * WARNING: 'Description' is currently a std::string, but it might change in the future
41         * do not expect it to remain the same, and always use the ModuleEntry::Description typedef
42         * instead.
43         */
44         typedef std::string Description;
45         void SetDescription(const char *d) { DescriptionField = d; }
46         const Description & GetDescription()const { return DescriptionField; }
47
48     protected:
49         // PS 3.3 repeats the name of an attribute, but often contains typos
50         // for now we will not use this info, but instead access the DataDict instead
51         std::string Name;
52
53         // An attribute, encoded as a Data Element, may or may not be required in a
54         // Data Set, depending on that Attribute's Data Element Type.
55         Type DataElementType;
56
57         // TODO: for now contains the raw description (with enumerated values, defined terms...)
58         Description DescriptionField;
59     };
60
61     //-----
62     inline std::ostream& operator<<(std::ostream& _os, const ModuleEntry &_val)
63     {
64         _os << _val.Name << "\t" << _val.DataElementType << "\t" << _val.DescriptionField;
65         return _os;
66     }
67
68     typedef ModuleEntry MacroEntry;
69 } // end namespace gdcm
70
71 #endif //GDCMMODULEENTRY_H

```

## 11.221 gdcmModules.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmModule.h"
#include <map>
```

Include dependency graph for gdcmModules.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Modules](#)  
Class for representing a *Modules*.

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Modules &_val)`

## 11.222 gdcmModules.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMODULES_H
15 #define GDCMMODULES_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmModule.h"
19
20 #include <map>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT Modules
25     {
26     public:
27         typedef std::map<std::string, Module> ModuleMapType;
28
29         Modules() = default;
30         friend std::ostream& operator<<(std::ostream& _os, const Modules &_val);
31
32         void Clear() { ModulesInternal.clear(); }
33
34         // A Module is inserted based on it's ref
35         void AddModule(const char *ref, const Module & module )
36     }
```

```

41     {
42         assert( ref && *ref );
43         assert( ModulesInternal.find( ref ) == ModulesInternal.end() );
44         ModulesInternal.insert(
45             ModuleMapType::value_type( ref, module ) );
46     }
47     const Module &GetModule( const char *name ) const
48 {
49     assert( name && *name );
50     ModuleMapType::const_iterator it = ModulesInternal.find( name );
51     assert( it != ModulesInternal.end() );
52     assert( it->first == name );
53     return it->second;
54 }
55
56 bool IsEmpty() const { return ModulesInternal.empty(); }
57
58 private:
59     ModuleMapType ModulesInternal;
60 };
61 //-----
62 inline std::ostream& operator<<(std::ostream& _os, const Modules &_val)
63 {
64     Modules::ModuleMapType::const_iterator it = _val.ModulesInternal.begin();
65     for(; it != _val.ModulesInternal.end(); ++it)
66     {
67         const std::string &name = it->first;
68         const Module &m = it->second;
69         _os << name << " " << m << '\n';
70     }
71     return _os;
72 }
73
74
75
76
77 } // end namespace gdcn
78
79 #endif //GDCNMODULES_H

```

## 11.223 gdcnNestedModuleEntries.h File Reference

```
#include "gdcnModuleEntry.h"
```

```
#include <vector>
```

Include dependency graph for gdcnNestedModuleEntries.h:

### Classes

- class [gdcn::NestedModuleEntries](#)  
Class for representing a *NestedModuleEntries*.

### Namespaces

- namespace [gdcn](#)

### Typedefs

- typedef NestedModuleEntries [gdcn::NestedMacroEntries](#)

## Functions

- `std::ostream & gdcmm::operator<< (std::ostream &_os, const NestedModuleEntries &_val)`

## 11.224 gdcmmNestedModuleEntries.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMNESTEDMODULEENTRIES_H
15 #define GDCMMNESTEDMODULEENTRIES_H
16
17 #include "gdcmmModuleEntry.h"
18 #include <vector>
19
20 namespace gdcmm
21 {
22     class GDCMM_EXPORT NestedModuleEntries : public ModuleEntry
23     {
24     public:
25         NestedModuleEntries(const char *name = "", const char *type = "3", const char *description =
26             ""):ModuleEntry(name,type,description) { }
27         friend std::ostream& operator<<(std::ostream& _os, const NestedModuleEntries &_val);
28
29         typedef std::vector<ModuleEntry>::size_type SizeType;
30         SizeType GetNumberOfModuleEntries() { return ModuleEntriesList.size(); }
31
32         const ModuleEntry &GetModuleEntry(SizeType idx)const { return ModuleEntriesList[idx]; }
33         ModuleEntry &GetModuleEntry(SizeType idx) { return ModuleEntriesList[idx]; }
34
35         void AddModuleEntry(const ModuleEntry &me) { ModuleEntriesList.push_back( me ); }
36
37     private:
38         std::vector<ModuleEntry> ModuleEntriesList;
39     };
40
41 //-----
42 inline std::ostream& operator<<(std::ostream& _os, const NestedModuleEntries &_val)
43 {
44     _os << "Nested:" << _val.Name << "\t" << _val.DataElementType << "\t" << _val.DescriptionField;
45     return _os;
46 }
47
48 typedef NestedModuleEntries NestedMacroEntries;
49
50 } // end namespace gdcmm
51
52 #endif //GDCMMNESTEDMODULEENTRIES_H

```

## 11.225 gdcmmPatient.h File Reference

```

#include "gdcmmTypes.h"
#include "gdcmmStudy.h"
Include dependency graph for gdcmmPatient.h:

```

## Classes

- class [gdcm::Patient](#)

*See PS 3.3 - 2007 DICOM MODEL OF THE REAL-WORLD, p 54.*

## Namespaces

- namespace [gdcm](#)

## 11.226 gdcmPatient.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPATIENT_H
15 #define GDCMPATIENT_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmStudy.h"
19
20 namespace gdcm
21 {
22     class GDCM_EXPORT Patient
23     {
24     public:
25         Patient() = default;
26
27     private:
28         std::vector<Study> StudyList;
29     };
30
31 } // end namespace gdcm
32
33 #endif //GDCMPATIENT_H

```

## 11.227 gdcmSeries.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmSeries.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::Series](#)  
[Series.](#)

## Namespaces

- namespace [gdcm](#)

## 11.228 gdcmSeries.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSERIES_H
15 #define GDCMSERIES_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT Series
22     {
23     public:
24         Series() = default;
25     private:
26         // Image, Waveform...
27     };
28 } // end namespace gdcm
29
30 #endif //GDCMSERIES_H

```

## 11.229 gdcmStudy.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmSeries.h"
#include <vector>

```

Include dependency graph for gdcmStudy.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::Study](#)  
*Study.*

## Namespaces

- namespace [gdcm](#)

## 11.230 gdcmStudy.h

[Go to the documentation of this file.](#)

```
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSTUDY_H
15 #define GDCMSTUDY_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmSeries.h"
19
20 #include <vector>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT Study
25     {
26     public:
27         Study() = default;
28     private:
29         std::vector<Series> SeriesList;
30     };
31
32 } // end namespace gdcm
33
34 #endif //GDCMSTUDY_H
```

## 11.231 gdcmTable.h File Reference

```
#include "gdcmTableEntry.h"
```

```
#include "gdcmTag.h"
```

```
#include <map>
```

Include dependency graph for gdcmTable.h:

### Classes

- class [gdcm::Table](#)  
*Table.*

### Namespaces

- namespace [gdcm](#)

## 11.232 gdcmTable.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 #ifndef GDCMTABLE_H
15 #define GDCMTABLE_H
16
17 #include "gdcmTableEntry.h"
18 #include "gdcmTag.h"
19
20 #include <map>
21
22 namespace gdcm
23 {
24
25 class Table
26 {
27 public:
28     typedef std::map<Tag, TableEntry> MapTableEntry;
29     Table() = default;
30     ~Table() = default;
31     Table &operator=(const Table &_val) = delete;
32     Table(const Table &_val) = delete;
33
34     friend std::ostream& operator<<(std::ostream& _os, const Table &_val);
35
36     void InsertEntry(Tag const &tag, TableEntry const &te)
37     {
38         #ifndef NDEBUG
39         MapTableEntry::size_type s = TableInternal.size();
40         #endif
41         TableInternal.insert(
42             MapTableEntry::value_type(tag, te));
43         assert( s < TableInternal.size() );
44     }
45
46     const TableEntry &GetTableEntry(const Tag &tag) const
47     {
48         MapTableEntry::const_iterator it =
49             TableInternal.find(tag);
50         if (it == TableInternal.end())
51         {
52             assert( 0 && "Impossible" );
53             return GetTableEntry(Tag(0,0));
54         }
55         return it->second;
56     }
57
58     MapTableEntry TableInternal;
59 };
60
61 // end namespace gdcm
62 #endif //GDCMTABLE_H

```

## 11.233 gdcmTableEntry.h File Reference

```

#include "gdcmType.h"
#include <string>

```

Include dependency graph for gdcmTableEntry.h: This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::TableEntry](#)  
*TableEntry.*

## Namespaces

- namespace [gdcm](#)

## 11.234 gdcmTableEntry.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTABLEENTRY_H
15 #define GDCMTABLEENTRY_H
16
17 #include "gdcmType.h"
18
19 #include <string>
20
21 namespace gdcm
22 {
23
24 class TableEntry
25 {
26 public:
27     TableEntry(const char *attribute = nullptr,
28               Type const &type = Type(), const char *des = nullptr) :
29         Attribute(attribute ? attribute : ""), TypeField(type), Description(des ? des : "") {}
30     ~TableEntry() = default;
31
32 private:
33     std::string Attribute;
34     Type TypeField;
35     std::string Description;
36 };
37
38 } // end namespace gdcm
39
40 #endif //GDCMTABLEENTRY_H

```

## 11.235 gdcmTableReader.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmDefs.h"
#include <string>
#include <vector>
#include <map>

```

Include dependency graph for gdcmTableReader.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::TableReader](#)

*Class for representing a [TableReader](#).*

## Namespaces

- namespace [gdcm](#)

## 11.236 gdcmTableReader.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTABLEREADER_H
15 #define GDCMTABLEREADER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmDefs.h"
19 // #include "gdcmModule.h"
20 // #include "gdcmIOD.h"
21 // #include "gdcmIODs.h"
22 // #include "gdcmModules.h"
23
24 #include <string>
25 #include <vector>
26 #include <map>
27
28 namespace gdcm
29 {
30     class GDCM_EXPORT TableReader
31     {
32     public:
33         TableReader(Defs &defs):CurrentDefs(defs),ParsingModule(false),ParsingModuleEntry(false),
34             ParsingModuleEntryDescription(false),
35             ParsingMacro(false),
36             ParsingMacroEntry(false),
37             ParsingMacroEntryDescription(false),
38             ParsingIOD(false),
39             ParsingIODEntry(false),
40             Description() {}
41         virtual ~TableReader() = default;
42
43         // Set/Get filename
44         void SetFilename(const char *filename) { Filename = filename; }
45         const char *GetFilename() { return Filename.c_str(); }
46
47         int Read();
48
49     protected:
50         // You need to override those function in your subclasses:
51         virtual void StartElement(const char *name, const char **atts);
52         virtual void EndElement(const char *name);
53         virtual void CharacterDataHandler(const char *data, int length);
54
55         void HandleModuleEntry(const char **atts);
56         void HandleModule(const char **atts);
57         void HandleModuleEntryDescription(const char **atts);
58     };
59
60 #endif

```

```

62 void HandleMacroEntry(const char **atts);
63 void HandleMacro(const char **atts);
64 void HandleMacroEntryDescription(const char **atts);
65 void HandleModuleInclude(const char **atts);
66 void HandleIODEntry(const char **atts);
67 void HandleIOD(const char **atts);
68
69 //const Modules & GetModules() const { return CurrentModules; }
70 //const Macros & GetMacros() const { return CurrentMacros; }
71 //const IODs & GetIODs() const { return CurrentIODs; }
72 const Defs & GetDefs()const { return CurrentDefs; }
73
74 private:
75     std::string Filename;
76     Defs &CurrentDefs;
77     //Macros CurrentMacros;
78     //Modules CurrentModules;
79     //IODs CurrentIODs;
80     Macro CurrentMacro;
81     Module CurrentModule;
82     IOD CurrentIOD;
83     MacroEntry CurrentMacroEntry;
84     ModuleEntry CurrentModuleEntry;
85     IODEntry CurrentIODEntry;
86     std::string CurrentModuleName;
87     std::string CurrentModuleRef;
88     std::string CurrentMacroRef;
89     bool ParsingModule;
90     bool ParsingModuleEntry;
91     bool ParsingModuleEntryDescription;
92     bool ParsingMacro;
93     bool ParsingMacroEntry;
94     bool ParsingMacroEntryDescription;
95     bool ParsingIOD;
96     bool ParsingIODEntry;
97     Tag CurrentTag;
98     std::string Description;
99 };
100
101 } // end namespace gdcm
102
103 #endif //GDCMTABLEREADER_H

```

## 11.237 gdcmType.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>

```

Include dependency graph for gdcmType.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Type](#)  
*Type.*

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Type &val)`

## 11.238 gdcmType.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMTYPE_H
16 #define GDCMTYPE_H
17
18 #include "gdcmTypes.h"
19
20 #include <iostream>
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT Type
26 {
27 public:
28     typedef enum {
29         T1 = 0,
30         T1C,
31         T2,
32         T2C,
33         T3,
34         UNKNOWN
35     } TypeType;
36
37     Type(TypeType type = UNKNOWN) : TypeField(type) { }
38
39     operator TypeType ()const { return TypeField; }
40     friend std::ostream &operator<<(std::ostream &os, const Type &vr);
41
42     static const char *GetTypeString(TypeType type);
43     static TypeType GetTypeType(const char *type);
44
45 private:
46     TypeType TypeField;
47 };
48
49 //-----
50 inline std::ostream &operator<<(std::ostream &_os, const Type &val)
51 {
52     _os << Type::GetTypeString(val.TypeField);
53     return _os;
54 }
55
56 } // end namespace gdcm
57
58 #endif //GDCMTYPE_H

```

## 11.239 gdcmUsage.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>

```

Include dependency graph for gdcmUsage.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Usage](#)  
*Usage.*

## Namespaces

- namespace [gdcm](#)

## Functions

- `std::ostream & gdcm::operator<< (std::ostream &_os, const Usage &val)`

## 11.240 gdcmUsage.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUSAGE_H
15 #define GDCMUSAGE_H
16
17 #include "gdcmTypes.h"
18
19 #include <iostream>
20
21 namespace gdcm
22 {
23
24     class GDCM_EXPORT Usage
25     {
26     public:
27         typedef enum {
28             Mandatory, // (see A.1.3.1) , abbreviated M
29             Conditional, // (see A.1.3.2) , abbreviated C
30             UserOption, // (see A.1.3.3) , abbreviated U
31             Invalid
32         } UsageType;
33
34         Usage(UsageType type = Invalid) : UsageField(type) { }
35
36         operator UsageType ()const { return UsageField; }
37         friend std::ostream &operator<<(std::ostream &os, const Usage &vr);
38
39         static const char *GetUsageString(UsageType type);
40         static UsageType GetUsageType(const char *type);
41
42     private:
43         UsageType UsageField;
44     };
45
46     //-----
47     inline std::ostream &operator<<(std::ostream &_os, const Usage &val)
48     {
49         _os << Usage::GetUsageString(val.UsageField);
50         return _os;
51     }
52
53 } // end namespace gdcm
54
55 #endif //GDCMUSAGE_H

```

## 11.241 gdcmXMLDictReader.h File Reference

```
#include "gdcmTableReader.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmTag.h"
```

Include dependency graph for gdcmXMLDictReader.h:

### Classes

- class [gdcm::XMLDictReader](#)  
*Class for representing a [XMLDictReader](#).*

### Namespaces

- namespace [gdcm](#)

## 11.242 gdcmXMLDictReader.h

[Go to the documentation of this file.](#)

```
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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMXMLDICTREADER_H
15 #define GDCMXMLDICTREADER_H
16
17 #include "gdcmTableReader.h"
18 #include "gdcmDict.h"
19 #include "gdcmDictEntry.h"
20 #include "gdcmTag.h"
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT XMLDictReader : public TableReader
25     {
26     public:
27         XMLDictReader();
28         ~XMLDictReader() {}
29
30         void StartElement(const char *name, const char **atts);
31         void EndElement(const char *name);
32         void CharacterDataHandler(const char *data, int length);
33
34         const Dict & GetDict() { return DICOMDict; }
35
36     protected:
37         void HandleEntry(const char **atts);
38         void HandleDescription(const char **atts);
39
40     private:
41         Dict DICOMDict;
42         Tag CurrentTag;
```

```

48 DictEntry CurrentDE;
49 bool ParsingDescription;
50 std::string Description;
51 };
52
53 } // end namespace gdcm
54
55 #endif //GDCMXMLDICTREADER_H

```

## 11.243 gdcmXMLPrivateDictReader.h File Reference

```

#include "gdcmTableReader.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmTag.h"

```

Include dependency graph for gdcmXMLPrivateDictReader.h:

### Classes

- class [gdcm::XMLPrivateDictReader](#)  
Class for representing a *XMLPrivateDictReader*.

### Namespaces

- namespace [gdcm](#)

## 11.244 gdcmXMLPrivateDictReader.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMXMLPRIVATEDICTREADER_H
15 #define GDCMXMLPRIVATEDICTREADER_H
16
17 #include "gdcmTableReader.h"
18 #include "gdcmDict.h"
19 #include "gdcmDictEntry.h"
20 #include "gdcmTag.h"
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT XMLPrivateDictReader : public TableReader
26 {
27 public:
28     XMLPrivateDictReader();
29     ~XMLPrivateDictReader() {}
30
31 }
32
33
34

```

```

35 void StartElement(const char *name, const char **atts);
36 void EndElement(const char *name);
37 void CharacterDataHandler(const char *data, int length);
38
39 const PrivateDict & GetPrivateDict() { return PDict; }
40
41 protected:
42 void HandleEntry(const char **atts);
43 void HandleDescription(const char **atts);
44
45 private:
46 PrivateDict PDict;
47 PrivateTag CurrentTag;
48 DictEntry CurrentDE;
49 bool ParsingDescription;
50 std::string Description;
51 };
52
53 } // end namespace gdcm
54
55 #endif //GDCMXMLPRIVATEDICTREADER_H

```

## 11.245 gdcmAnonymizeEvent.h File Reference

```

#include "gdcmEvent.h"
#include "gdcmTag.h"

```

Include dependency graph for gdcmAnonymizeEvent.h: This graph shows which files directly or indirectly include this file:

### Classes

- class `gdcm::AnonymizeEvent`  
*AnonymizeEvent.*

### Namespaces

- namespace `gdcm`

## 11.246 gdcmAnonymizeEvent.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMANONYMIZEEVENT_H
15 #define GDCMANONYMIZEEVENT_H
16
17 #include "gdcmEvent.h"

```



```

18 #include "gdcmTag.h"
19
20 namespace gdcm
21 {
22
29 class AnonymizeEvent : public AnyEvent
30 {
31 public:
32     typedef AnonymizeEvent Self;
33     typedef AnyEvent Superclass;
34     AnonymizeEvent(Tag const &tag = 0):m_Tag(tag) {}
35     ~AnonymizeEvent() override = default;
36     AnonymizeEvent(const Self&s) : AnyEvent(s){};
37     void operator=(const Self&) = delete;
38
39     const char * GetEventName()const override { return "AnonymizeEvent"; }
40     bool CheckEvent(const ::gdcm::Event* e)const override
41     { return (dynamic_cast<const Self*>(e) == nullptr ? false : true) ; }
42     ::gdcm::Event* MakeObject()const override
43     { return new Self; }
44
45     void SetTag(const Tag& t) { m_Tag = t; }
46     Tag const & GetTag()const { return m_Tag; }
47 private:
48     Tag m_Tag;
49 };
50
51
52 } // end namespace gdcm
53
54 #endif //GDCMANONYMIZEEVENT_H

```

## 11.247 gdcmAnonymizer.h File Reference

```

#include "gdcmFile.h"
#include "gdcmSubject.h"
#include "gdcmEvent.h"
#include "gdcmSmartPointer.h"
#include <map>

```

Include dependency graph for gdcmAnonymizer.h:

### Classes

- class [gdcm::Anonymizer](#)  
*Anonymizer.*

### Namespaces

- namespace [gdcm](#)

## 11.248 gdcmAnonymizer.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4

```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMANONYMIZER_H
15 #define GDCMANONYMIZER_H
16
17 #include "gdcmFile.h"
18 #include "gdcmSubject.h"
19 #include "gdcmEvent.h"
20 #include "gdcmSmartPointer.h"
21
22 #include <map>
23
24 namespace gdcm
25 {
26 class TagPath;
27 class IOD;
28 class CryptographicMessageSyntax;
29
30 class GDCM_EXPORT Anonymizer : public Subject
31 {
32 public:
33     Anonymizer():F(new File),CMS(nullptr) {}
34     ~Anonymizer() override;
35
36     bool Empty( Tag const &t );
37
38     bool Empty( PrivateTag const &pt );
39
40     bool Clear( Tag const &t );
41     bool Clear( PrivateTag const &pt );
42
43     bool Remove( Tag const &t );
44
45     bool Remove( PrivateTag const &pt );
46
47     bool Replace( Tag const &t, const char *value );
48     bool Replace( PrivateTag const &t, const char *value );
49
50     bool Replace( Tag const &t, const char *value, VL const &vl );
51     bool Replace( PrivateTag const &t, const char *value, VL const &vl );
52
53     bool RemovePrivateTags();
54
55     bool RemoveGroupLength();
56
57     bool RemoveRetired();
58
59     void SetFile(const File& f) { F = f; }
60     //const File &GetFile() const { return *F; }
61     File &GetFile() { return *F; }
62
63     bool BasicApplicationLevelConfidentialityProfile(bool deidentify = true);
64
65     void SetCryptographicMessageSyntax( CryptographicMessageSyntax *cms );
66     const CryptographicMessageSyntax *GetCryptographicMessageSyntax() const;
67
68     static SmartPointer<Anonymizer> New() { return new Anonymizer; }
69
70     static std::vector<Tag> GetBasicApplicationLevelConfidentialityProfileAttributes();
71
72     static void ClearInternalUIDs();
73
74 protected:
75     // Internal function used to either empty a tag or set it's value to a dummy value (Type 1 vs Type 2)
76     bool BALCPPProtect(DataSet &ds, Tag const &tag, const IOD &ioid);
77     bool CanEmptyTag(Tag const &tag, const IOD &ioid) const;
78     void RecurseDataSet( DataSet &ds );
79
80 private:
81     bool BasicApplicationLevelConfidentialityProfile1();
82     bool BasicApplicationLevelConfidentialityProfile2();
83     bool CheckIfSequenceContainsAttributeToAnonymize(File const &file, SequenceOfItems* sqi) const;
84
85 private:

```

```

162 // I would prefer to have a smart pointer to DataSet but DataSet does not derive from Object...
163 SmartPointer<File> F;
164 CryptographicMessageSyntax *CMS;
165
166 typedef std::pair< Tag, std::string > TagValueKey;
167 typedef std::map< TagValueKey, std::string > DummyMapNonUIDTags;
168 typedef std::map< std::string, std::string > DummyMapUIDTags;
169 static DummyMapNonUIDTags dummyMapNonUIDTags;
170 static DummyMapUIDTags dummyMapUIDTags;
171 };
172
173 } // end namespace gdcm
174
175 #endif //GDCMANONYMIZER_H

```

## 11.249 gdcmApplicationEntity.h File Reference

```

#include "gdcmTypes.h"
#include <vector>
#include <stdlib.h>

```

Include dependency graph for gdcmApplicationEntity.h:

### Classes

- class [gdcm::ApplicationEntity](#)  
*ApplicationEntity.*

### Namespaces

- namespace [gdcm](#)

## 11.250 gdcmApplicationEntity.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMAPPLICATIONENTITY_H
15 #define GDCMAPPLICATIONENTITY_H
16
17 #include "gdcmTypes.h"
18 #include <vector>
19 #include <stdlib.h> // abort
20
21 namespace gdcm
22 {
23
24     class GDCM_EXPORT ApplicationEntity

```

```

36 {
37 public:
38     static const unsigned int MaxNumberOfComponents = 1;
39     static const unsigned int MaxLength = 16;
40     std::string Internal;
41     static const char Separator = ' ';
42     static const char Padding = ' ';
43     //static const char Excluded[5] = { '\\', /* 5CH */, '\n' /* LF */, '\f', /* FF */, '\r' /* CR */, 0x1b /*
44         ESC */};
45     bool IsValid()const {
46         return true;
47     }
48     void Squeeze() {
49         // trim leading and trailing white spaces
50     }
51     void SetBlob(const std::vector<char>& v) {
52         (void)v;
53         assert(0); //TODO
54     }
55     void Print(std::ostream &os)const {
56         (void)os;
57         assert(0); //TODO
58     }
59 };
60
61 } // end namespace gdcm
62
63 #endif //GDCMAPPLICATIONENTITY_H

```

## 11.251 gdcmAudioCodec.h File Reference

#include "gdcmCodec.h"

Include dependency graph for gdcmAudioCodec.h:

### Classes

- class [gdcm::AudioCodec](#)  
*AudioCodec.*

### Namespaces

- namespace [gdcm](#)

## 11.252 gdcmAudioCodec.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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11 PURPOSE. See the above copyright notice for more information.
12

```

```

13 =====*/
14 #ifndef GDCMAUDIOCODEC_H
15 #define GDCMAUDIOCODEC_H
16
17 #include "gdcmCodec.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT AudioCodec : public Codec
23 {
24 public:
25     AudioCodec();
26     ~AudioCodec() override;
27     bool CanCode(TransferSyntax const &)const override { return false; }
28     bool CanDecode(TransferSyntax const &)const override { return false; }
29     bool Decode(DataElement const &is, DataElement &os) override;
30 };
31
32 } // end namespace gdcm
33
34 #endif //GDCMAUDIOCODEC_H

```

## 11.253 gdcmBitmap.h File Reference

```

#include "gdcmObject.h"
#include "gdcmCurve.h"
#include "gdcmDataElement.h"
#include "gdcmLookupTable.h"
#include "gdcmOverlay.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmPixelFormat.h"
#include "gdcmSmartPointer.h"
#include "gdcmTransferSyntax.h"
#include <vector>

```

Include dependency graph for gdcmBitmap.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Bitmap](#)  
*Bitmap class.*

### Namespaces

- namespace [gdcm](#)

## 11.254 gdcmBitmap.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBITMAP_H
15 #define GDCMBITMAP_H
16
17 #include "gdcmObject.h"
18 #include "gdcmCurve.h"
19 #include "gdcmDataElement.h"
20 // #include "gdcmIconImage.h"
21 #include "gdcmLookupTable.h"
22 #include "gdcmOverlay.h"
23 #include "gdcmPhotometricInterpretation.h"
24 #include "gdcmPixelFormat.h"
25 #include "gdcmSmartPointer.h"
26 #include "gdcmTransferSyntax.h"
27
28 #include <vector>
29
30 namespace gdcm
31 {
32
33 class GDCM_EXPORT Bitmap : public Object
34 {
35 public:
36     Bitmap();
37     ~Bitmap() override;
38     void Print(std::ostream &) const override;
39
40     virtual bool AreOverlaysInPixelData()const { return false; }
41     virtual bool UnusedBitsPresentInPixelData()const { return false; }
42
43     unsigned int GetNumberOfDimensions() const;
44     void SetNumberOfDimensions(unsigned int dim);
45
46     unsigned int GetPlanarConfiguration() const;
47     void SetPlanarConfiguration(unsigned int pc);
48
49     bool GetNeedByteSwap()const
50     {
51         return NeedByteSwap;
52     }
53     void SetNeedByteSwap(bool b)
54     {
55         NeedByteSwap = b;
56     }
57
58     void SetTransferSyntax(TransferSyntax const &ts) {
59         TS = ts;
60     }
61     const TransferSyntax &GetTransferSyntax()const {
62         return TS;
63     }
64     bool IsTransferSyntaxCompatible( TransferSyntax const &ts ) const;
65     void SetDataElement(DataElement const &de) {
66         PixelData = de;
67     }
68     const DataElement& GetDataElement()const { return PixelData; }
69     DataElement& GetDataElement() { return PixelData; }
70
71     void SetLUT(LookupTable const &lut)
72     {
73         LUT = SmartPointer<LookupTable>( const_cast<LookupTable*>(&lut) );
74     }
75     const LookupTable &GetLUT()const
76     {
77         return *LUT;
78     }
79     LookupTable &GetLUT()
80     {
81         return *LUT;
82     }
83
84     const unsigned int *GetDimensions() const;
85     unsigned int GetDimension(unsigned int idx) const;
86
87
88
89
90
91
92
93
94
95
96
97
98
99

```

```

100 void SetColumns(unsigned int col) { SetDimension(0,col); }
101 unsigned int GetColumns()const { return GetDimension(0); }
102 void SetRows(unsigned int rows) { SetDimension(1,rows); }
103 unsigned int GetRows()const { return GetDimension(1); }
104 void SetDimensions(const unsigned int dims[3]);
105 void SetDimension(unsigned int idx, unsigned int dim);
107 const PixelFormat &GetPixelFormat()const
108 {
109     return PF;
110 }
111 PixelFormat &GetPixelFormat()
112 {
113     return PF;
114 }
115 void SetPixelFormat(PixelFormat const &pf)
116 {
117     PF = pf;
118     PF.Validate();
119 }
120
122 const PhotometricInterpretation &GetPhotometricInterpretation() const;
123 void SetPhotometricInterpretation(PhotometricInterpretation const &pi);
124
125 bool IsEmpty()const { return Dimensions.empty(); }
126 void Clear();
127
131 unsigned long GetBufferLength() const;
132
134 bool GetBuffer(char *buffer) const;
135
137 bool IsLossy() const;
138
140 void SetLossyFlag(bool f) { LossyFlag = f; }
141
142 protected:
143 bool TryRAWCodec(char *buffer, bool &lossyflag) const;
144 bool TryJPEGCodec(char *buffer, bool &lossyflag) const;
145 bool TryPVRGCodec(char *buffer, bool &lossyflag) const;
146 bool TryKAKADUCodec(char *buffer, bool &lossyflag) const;
147 bool TryJPEGLSCodec(char *buffer, bool &lossyflag) const;
148 bool TryJPEG2000Codec(char *buffer, bool &lossyflag) const;
149 bool TryRLECodec(char *buffer, bool &lossyflag) const;
150
151 bool TryJPEGCodec2(std::ostream &os) const;
152 bool TryJPEG2000Codec2(std::ostream &os) const;
153
154 bool GetBuffer2(std::ostream &os) const;
155
156 friend class PixmapReader;
157 friend class ImageChangeTransferSyntax;
158 // Function to compute the lossy flag based only on the image buffer.
159 // Watch out that image can be lossy but in implicit little endian format...
160 bool ComputeLossyFlag();
161
162 //private:
163 protected:
164 unsigned int PlanarConfiguration;
165 unsigned int NumberOfDimensions;
166 TransferSyntax TS;
167 PixelFormat PF; // SamplesPerPixel, BitsAllocated, BitsStored, HighBit, PixelRepresentation
168 PhotometricInterpretation PI;
169 // Mind dump: unsigned int is required here, since we are reading (0028,0008) Number Of Frames
170 // which is VR::IS, so I cannot simply assumed that unsigned short is enough... :(
171 std::vector<unsigned int> Dimensions; // Col/Row
172 DataElement PixelData; // copied from 7fe0,0010
173
174 typedef SmartPointer<LookupTable> LUTPtr;
175 LUTPtr LUT;
176 // I believe the following 3 ivars can be derived from TS ...
177 bool NeedByteSwap; // FIXME: remove me
178 bool LossyFlag;
179
180 private:
181 bool GetBufferInternal(char *buffer, bool &lossyflag) const;
182 };
183
184 } // end namespace gdcm
185
186 #endif //GDCMBITMAP_H

```

## 11.255 gdcmBitmapToBitmapFilter.h File Reference

```
#include "gdcmBitmap.h"
```

Include dependency graph for gdcmBitmapToBitmapFilter.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::BitmapToBitmapFilter](#)  
*BitmapToBitmapFilter* class.

### Namespaces

- namespace [gdcm](#)

## 11.256 gdcmBitmapToBitmapFilter.h

[Go to the documentation of this file.](#)

```
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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMBITMAPTOBITMAPFILTER_H
15 #define GDCMBITMAPTOBITMAPFILTER_H
16
17 #include "gdcmBitmap.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT BitmapToBitmapFilter
23     {
24     public:
25         BitmapToBitmapFilter();
26         ~BitmapToBitmapFilter() = default;
27
28         void SetInput(const Bitmap& image);
29
30         const Bitmap &GetOutput() const { return *Output; }
31
32         // SWIG/Java hack:
33         const Bitmap &GetOutputAsBitmap() const;
34
35     protected:
36         SmartPointer<Bitmap> Input;
37         SmartPointer<Bitmap> Output;
38     };
39
40 } // end namespace gdcm
41
42 #endif //GDCMBITMAPTOBITMAPFILTER_H
```



## 11.257 gdcmCleaner.h File Reference

```
#include "gdcmDPath.h"
#include "gdcmFile.h"
#include "gdcmSmartPointer.h"
#include "gdcmSubject.h"
Include dependency graph for gdcmCleaner.h:
```

### Classes

- class [gdcm::Cleaner](#)  
*Cleaner.*

### Namespaces

- namespace [gdcm](#)

## 11.258 gdcmCleaner.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCLEANER_H
15 #define GDCMCLEANER_H
16
17 #include "gdcmDPath.h"
18 #include "gdcmFile.h"
19 #include "gdcmSmartPointer.h"
20 #include "gdcmSubject.h"
21
22 namespace gdcm {
23 class GDCM_EXPORT Cleaner : public Subject {
24 public:
25     Cleaner();
26     ~Cleaner() override;
27
28     bool Empty(Tag const &t);
29     bool Empty(PrivateTag const &pt);
30     bool Empty(DPath const &dpath);
31     bool Empty(VR const &vr);
32
33     bool Remove(Tag const &t);
34     bool Remove(PrivateTag const &pt);
35     bool Remove(DPath const &dpath);
36     bool Remove(VR const &vr);
37
38     bool Scrub(Tag const &t);
39     bool Scrub(PrivateTag const &pt);
40     bool Scrub(DPath const &dpath);
41     bool Scrub(VR const &vr);
42
43 };
44
45 }
```

```

52  bool Preserve(DPath const &dpath);
53
56  void RemoveAllMissingPrivateCreator(bool remove);
57
60  bool RemoveMissingPrivateCreator(Tag const &t);
61
63  void RemoveAllGroupLength(bool remove);
64
66  void RemoveAllIllegal(bool remove);
67
69  bool Clean();
70
72  void SetFile(const File &f) { F = f; }
73  // const File &GetFile() const { return *F; }
74  File &GetFile() { return *F; }
75
77  static SmartPointer<Cleaner> New() { return new Cleaner; }
78
79 private:
80  // I would prefer to have a smart pointer to DataSet but DataSet does not
81  // derive from Object...
82  SmartPointer<File> F;
83  struct impl;
84  // PIMPL idiom
85  impl *pimpl;
86 };
87
88 } // end namespace gdcm
89
90 #endif // GDCMCLEANER_H

```

## 11.259 gdcmCodec.h File Reference

```

#include "gdcmCoder.h"
#include "gdcmDecoder.h"

```

Include dependency graph for gdcmCodec.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Codec](#)  
*Codec class.*

### Namespaces

- namespace [gdcm](#)

## 11.260 gdcmCodec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR

```

```

11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCODEC_H
15 #define GDCMCODEC_H
16
17 #include "gdcmCoder.h"
18 #include "gdcmDecoder.h"
19
20 namespace gdcm
21 {
22
26 class GDCM_EXPORT Codec : public Coder, public Decoder
27 {
28 };
29
30 } // end namespace gdcm
31
32 #endif //GDCMCODEC_H

```

## 11.261 gdcmCoder.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmDataElement.h"

```

Include dependency graph for gdcmCoder.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Coder](#)  
*Coder.*

### Namespaces

- namespace [gdcm](#)

## 11.262 gdcmCoder.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program: GDCM (Grassroots DICOM). A DICOM library
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCODER_H
15 #define GDCMCODER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmDataElement.h" // FIXME
19
20 namespace gdcm
21 {

```

```

22
23 class TransferSyntax;
24 class DataElement;
25 class GDCM_EXPORT Coder
26 {
27 public:
28     virtual ~Coder() = default;
29
30     virtual bool CanCode(TransferSyntax const &) const = 0;
31
32     // Note: in / out are reserved keyword in C#. Change to in_ / out_
33
34     virtual bool Code(DataElement const &in_, DataElement &out_) { (void)in_; (void)out_; return false; }
35 protected:
36     virtual bool InternalCode(const char *bv, unsigned long len, std::ostream &os) {
37         (void)bv; (void)os; (void)len; return false; }
38 };
39
40 } // end namespace gdcmm
41
42 #endif //GDCM_CODER_H

```

## 11.263 gdcmmConstCharWrapper.h File Reference

### Classes

- class [gdcmm::ConstCharWrapper](#)

*Do not use me.*

### Namespaces

- namespace [gdcmm](#)

## 11.264 gdcmmConstCharWrapper.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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7  See Copyright.txt or http://gdcmm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCM_CONSTCHARWRAPPER_H
15 #define GDCM_CONSTCHARWRAPPER_H
16
17 namespace gdcmm
18 {
19
20 #error
21
22 /*
23 * This class is a pure hack. Its only goal is to work around a bad bug in :
24 * $ swig -version
25 * SWIG Version 1.3.31
26 *
27 * See

```

```

28 * -
29 *   http://sourceforge.net/mailarchive/forum.php?thread_name=bf0c3b3f0802290552y5163989t76572b80a044ce28%40mail.gmail.com&forum=
30 *   As a side note there is also a problem with const reference to enum type:
31 * -
32 *   http://sourceforge.net/mailarchive/forum.php?thread_name=bf0c3b3f0802290552y5163989t76572b80a044ce28%40mail.gmail.com&forum=
33 *   And to keep track of an issue with swig here is the last one:
34 *
35 * -
36 *   http://sourceforge.net/mailarchive/forum.php?thread_name=bf0c3b3f0802290552y5163989t76572b80a044ce28%40mail.gmail.com&forum=
37 */
38
42 class ConstCharWrapper
43 {
44 public:
45   ConstCharWrapper(const char *i=0):Internal(i) {}
46   operator const char * () const { return Internal; }
47 private:
48   const char *Internal;
49 };
50
51 } // end namespace gdcm
52
53 #endif //GDCMCONSTCHARWRAPPER_H

```

## 11.265 gdcmCurve.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmObject.h"
#include <vector>

```

Include dependency graph for gdcmCurve.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Curve](#)  
*Curve class to handle element 50xx,3000 Curve Data.*

### Namespaces

- namespace [gdcm](#)

## 11.266 gdcmCurve.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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11 PURPOSE. See the above copyright notice for more information.
12

```

```

13 =====*/
14 #ifndef GDCMCURVE_H
15 #define GDCMCURVE_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmObject.h"
19
20 #include <vector>
21
22 namespace gdcm
23 {
24
25 class CurveInternal;
26 class ByteValue;
27 class DataSet;
28 class DataElement;
29
30 class GDCM_EXPORT Curve : public Object
31 {
32 public:
33     Curve();
34     ~Curve() override;
35     void Print(std::ostream &) const override;
36
37     void GetAsPoints(float *array) const;
38
39     static unsigned int GetNumberOfCurves(DataSet const & ds);
40
41     // Update curve data from dataelement de:
42     void Update(const DataElement & de);
43
44     void SetGroup(unsigned short group);
45     unsigned short GetGroup() const;
46     void SetDimensions(unsigned short dimensions);
47     unsigned short GetDimensions() const;
48     void SetNumberOfPoints(unsigned short numberofpoints);
49     unsigned short GetNumberOfPoints() const;
50     void SetTypeOfData(const char *typeofdata);
51     const char *GetTypeOfData() const;
52     // See PS 3.3 - 2004 - C.10.2.1.1 Type of data
53     const char *GetTypeOfDataDescription() const;
54     void SetCurveDescription(const char *curvedescription);
55     void SetDataValueRepresentation(unsigned short datavaluerepresentation);
56     unsigned short GetDataValueRepresentation() const;
57     void SetCurveDataDescriptor(const uint16_t * values, size_t num);
58     std::vector<unsigned short> const &GetCurveDataDescriptor() const;
59     void SetCoordinateStartValue( unsigned short v );
60     void SetCoordinateStepValue( unsigned short v );
61
62     void SetCurve(const char *array, unsigned int length);
63
64     bool IsEmpty() const;
65
66     void Decode(std::istream &is, std::ostream &os);
67
68     Curve(Curve const &ov);
69 private:
70     double ComputeValueFromStartAndStep(unsigned int idx) const;
71     CurveInternal *Internal;
72 };
73
74 } // end namespace gdcm
75
76 #endif //GDCMCURVE_H

```

## 11.267 gdcmDataSetHelper.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmVR.h"
```

Include dependency graph for gdcmDataSetHelper.h:

### Classes

- class [gdcm::DataSetHelper](#)

*DataSetHelper* (internal class, not intended for user level)

## Namespaces

- namespace `gdcm`

## 11.268 gdcmDataSetHelper.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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4
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDATASETHELPER_H
15 #define GDCMDATASETHELPER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmVR.h"
19
20 namespace gdcm
21 {
22   class DataSet;
23   class File;
24   class Tag;
25   class SequenceOfItems;
26
27   class GDCM_EXPORT DataSetHelper
28   {
29   public:
30     static VR ComputeVR(File const & file, DataSet const &ds, const Tag& tag);
31
32     //static SequenceOfItems* ComputeSQFromByteValue(File const & file, DataSet const &ds, const Tag &tag);
33   protected:
34   };
35 } // end namespace gdcm
36
37 #endif // GDCMDATASETHELPER_H

```

## 11.269 gdcmDecoder.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmDataElement.h"

```

Include dependency graph for `gdcmDecoder.h`: This graph shows which files directly or indirectly include this file:

## Classes

- class `gdcm::Decoder`  
*Decoder.*

## Namespaces

- namespace [gdcm](#)

## 11.270 gdcmDecoder.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMDECODER_H
16 #define GDCMDECODER_H
17
18 #include "gdcmTypes.h"
19 #include "gdcmDataElement.h" // FIXME
20
21 namespace gdcm
22 {
23
24 class TransferSyntax;
25 class DataElement;
26 class GDCM_EXPORT Decoder
27 {
28 public:
29     virtual ~Decoder() = default;
30
31     virtual bool CanDecode(TransferSyntax const &) const = 0;
32
33     virtual bool Decode(DataElement const &, DataElement &) { return false; }
34 protected:
35     virtual bool DecodeByStreams(std::istream &, std::ostream &) { return false; }
36 };
37
38 } // end namespace gdcm
39
40 #endif //GDCMDECODER_H

```

## 11.271 gdcmDeltaEncodingCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for `gdcmDeltaEncodingCodec.h`:

## Classes

- class [gdcm::DeltaEncodingCodec](#)  
*DeltaEncodingCodec* compression used by some private vendor.

## Namespaces

- namespace [gdcm](#)



## 11.272 gdcmDeltaEncodingCodec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDELTAENCODINGCODEC_H
15 #define GDCMDELTAENCODINGCODEC_H
16
17 #include "gdcmImageCodec.h"
18 #error do not use
19
20 namespace gdcm
21 {
22
23 class DeltaEncodingCodec : public ImageCodec
24 {
25 public:
26     DeltaEncodingCodec();
27     ~DeltaEncodingCodec();
28     bool CanDecode(TransferSyntax const &ts);
29     bool Decode(DataElement const &is, DataElement &os);
30 protected:
31     bool Decode(std::istream &is, std::ostream &os);
32 };
33
34 } // end namespace gdcm
35
36 #endif //GDCMDELTAENCODINGCODEC_H

```

## 11.273 gdcmDICOMDIR.h File Reference

```

#include <utility>
#include "gdcmFileSet.h"

```

Include dependency graph for gdcmDICOMDIR.h:

### Classes

- class [gdcm::DICOMDIR](#)  
*DICOMDIR* class.

### Namespaces

- namespace [gdcm](#)

## 11.274 gdcmDICOMDIR.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDICOMDIR_H
15 #define GDCMDICOMDIR_H
16
17 #include <utility>
18 #include "gdcmFileSet.h"
19
20 namespace gdcm
21 {
22
23   class GDCM_EXPORT DICOMDIR
24   {
25   public:
26     DICOMDIR() = default;
27     DICOMDIR(FileSet fs) : _FS(std::move(std::move(fs))) {}
28
29   private:
30     FileSet _FS;
31     //13 sept 2010 mmr-- added the underscore to FS to compile under Sunos gcc
32   };
33
34 } // end namespace gdcm
35
36 #endif //GDCMDICOMDIR_H

```

## 11.275 gdcmDICOMDIRGenerator.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include <utility>

```

Include dependency graph for gdcmDICOMDIRGenerator.h:

### Classes

- class [gdcm::DICOMDIRGenerator](#)  
*DICOMDIRGenerator* class.

### Namespaces

- namespace [gdcm](#)

## 11.276 gdcmDICOMDIRGenerator.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDICOMDIRGENERATOR_H
15 #define GDCMDICOMDIRGENERATOR_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmTag.h"
19 #include <utility> // std::pair
20
21 namespace gdcm
22 {
23     class File;
24     class Scanner;
25     class SequenceOfItems;
26     class VL;
27     class DICOMDIRGeneratorInternal;
28
29     class GDCM_EXPORT DICOMDIRGenerator
30     {
31     public:
32         typedef Directory::FilenameType  FilenameType;
33         typedef Directory::FilenameType  FilenameType;
34         DICOMDIRGenerator();
35         ~DICOMDIRGenerator();
36
37         void SetFilenames( FilenameType const & fns );
38
39         void SetRootDirectory( FilenameType const & root );
40
41         void SetDescriptor( const char *d );
42
43         bool Generate();
44
45         void SetFile(const File& f);
46         File &GetFile();
47
48     protected:
49         Scanner &GetScanner();
50         bool AddPatientDirectoryRecord();
51         bool AddStudyDirectoryRecord();
52         bool AddSeriesDirectoryRecord();
53         bool AddImageDirectoryRecord();
54
55     private:
56         const char *ComputeFileID(const char *);
57         bool TraverseDirectoryRecords(VL start );
58         bool ComputeDirectoryRecordsOffset(const SequenceOfItems *sqi, VL start);
59         size_t FindNextDirectoryRecord( size_t item1, const char *directorytype );
60         SequenceOfItems *GetDirectoryRecordSequence();
61         size_t FindLowerLevelDirectoryRecord( size_t item1, const char *directorytype );
62         typedef std::pair< std::string, Tag> MyPair;
63         MyPair GetReferenceValueForDirectoryType(size_t item);
64         bool SeriesBelongToStudy(const char *seriesuid, const char *studyuid);
65         bool ImageBelongToSeries(const char *sopuid, const char *seriesuid, Tag const &t1, Tag const &t2);
66         bool ImageBelongToSameSeries(const char *sopuid, const char *seriesuid, Tag const &t);
67
68         DICOMDIRGeneratorInternal * Internals;
69     };
70 } // end namespace gdcm
71
72 #endif //GDCMDICOMDIRGENERATOR_H

```

## 11.277 gdcmDictPrinter.h File Reference

```
#include "gdcmPrinter.h"
```

Include dependency graph for gdcmDictPrinter.h:

### Classes

- class [gdcm::DictPrinter](#)  
*DictPrinter class.*

### Namespaces

- namespace [gdcm](#)

## 11.278 gdcmDictPrinter.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDICTPRINTER_H
15 #define GDCMDICTPRINTER_H
16
17 #include "gdcmPrinter.h"
18
19 namespace gdcm
20 {
21
22 // It's a sink there is no output
23 class GDCM_EXPORT DictPrinter : public Printer
24 {
25 public:
26     DictPrinter();
27     ~DictPrinter();
28
29     void Print(std::ostream& os);
30
31 protected:
32     void PrintDataElement2(std::ostream& os, const DataSet &ds, const DataElement &ide);
33     void PrintDataSet2(std::ostream& os, const DataSet &ds);
34 };
35
36 } // end namespace gdcm
37
38 #endif //GDCMDICTPRINTER_H
```

## 11.279 gdcmDirectionCosines.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDirectionCosines.h:

## Classes

- class [gdcm::DirectionCosines](#)  
*class to handle [DirectionCosines](#)*

## Namespaces

- namespace [gdcm](#)

## 11.280 gdcmDirectionCosines.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDIRECTIONCOSINES_H
15 #define GDCMDIRECTIONCOSINES_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT DirectionCosines
23     {
24     public:
25         DirectionCosines();
26         DirectionCosines(const double dircos[6]);
27         // Cannot get the following signature to be wrapped with swig...
28         //DirectionCosines(const double *dircos = 0 );
29         ~DirectionCosines();
30
31         void Print(std::ostream &) const;
32
33         void Cross(double z[3]) const;
34
35         double Dot() const;
36
37         static double Dot(const double x[3], const double y[3]);
38
39         void Normalize();
40
41         static void Normalize(double v[3]);
42
43         operator const double* () const { return Values; }
44
45         bool IsValid() const;
46
47         bool SetFromString(const char *str);
48
49         double CrossDot(DirectionCosines const &dc) const;
50
51         double ComputeDistAlongNormal(const double ipp[3]) const;
52
53     private:
54         double Values[6];
55     };
56
57 } // end namespace gdcm
58
59 #endif //GDCMDIRECTIONCOSINES_H

```

## 11.281 gdcmDirectoryHelper.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmDataSet.h"
Include dependency graph for gdcmDirectoryHelper.h:
```

### Classes

- class `gdcm::DirectoryHelper`  
*DirectoryHelper.*

### Namespaces

- namespace `gdcm`

## 11.282 gdcmDirectoryHelper.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #include "gdcmDirectory.h"
16 #include "gdcmDataSet.h"
17
18 namespace gdcm
19 {
20
21 class GDCM_EXPORT DirectoryHelper
22 {
23 public:
24     //returns all series UUIDs in a given directory that match a particular SOP Instance UID
25     static Directory::FileNamesType GetSeriesUUIDsBySOPClassUID(const std::string& inDirectory,
26         const std::string& inSOPClassUID);
27
28     //specific implementations of the SOPClassUID grabber, so you don't have to
29     //remember the SOP Class UUIDs of CT or MR images.
30     static Directory::FileNamesType GetCTImageSeriesUUIDs(const std::string& inDirectory);
31     static Directory::FileNamesType GetMRImageSeriesUUIDs(const std::string& inDirectory);
32     static Directory::FileNamesType GetRTStructSeriesUUIDs(const std::string& inDirectory);
33
34     //given a directory and a series UID, provide all filenames with that series UID.
35     static Directory::FileNamesType GetFilenamesFromSeriesUUIDs(const std::string& inDirectory,
36         const std::string& inSeriesUID);
37
38     //given a series UID, load all the images associated with that series UID
39     //these images will be IPP sorted, so that they can be used for gathering all
40     //the necessary information for generating an RTStruct
41     //this function should be called by the writer once, if the writer's dataset
42     //vector is empty. Make sure to have a new writer for new rtstructs.
43     static std::vector<DataSet> LoadImageFromFiles(const std::string& inDirectory,
44         const std::string& inSeriesUID);
45
46 }
```

```

60 //When writing RTStructs, each contour will have z position defined.
61 //use that z position to determine the SOPInstanceUID for that plane.
62 static std::string RetrieveSOPInstanceUIDFromZPosition(double inZPos,
63     const std::vector<DataSet>& inDS);
64
65 //When writing RTStructs, the frame of reference is done by planes to start with
66 static std::string RetrieveSOPInstanceUIDFromIndex(int inIndex,
67     const std::vector<DataSet>& inDS);
68
69 //each plane needs to know the SOPClassUID, and that won't change from image to image
70 //so, retrieve this once at the start of writing.
71 static std::string GetSOPClassUID(const std::vector<DataSet>& inDS);
72
73 //retrieve the frame of reference from the set of datasets
74 static std::string GetFrameOfReference(const std::vector<DataSet>& inDS);
75
76 //both the image and polydata readers use these functions to get std::strings
77 static std::string GetStringValueFromTag(const Tag& t, const DataSet& ds);
78 };
79
80 }

```

## 11.283 gdcmDPath.h File Reference

```

#include "gdcmTag.h"
#include <string>

```

Include dependency graph for gdcmDPath.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::DPath](#)  
*class to handle a DICOM path While supp 118 did introduced a notion of XPath for XML Native model this convention is too XML-centric. Instead prefer DCMTK style notation <https://groups.google.com/g/comp.protocols.dicom/c/IyIH0IOBMPA>*

### Namespaces

- namespace [gdcm](#)

### Functions

- std::ostream & [gdcm::operator<<](#) (std::ostream &os, const DPath &val)

## 11.284 gdcmDPath.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8

```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDPATH_H
15 #define GDCMDPATH_H
16
17 #include "gdcmTag.h"
18 #include <string>
19
20 namespace gdcm {
21
22     class GDCM_EXPORT DPath {
23     friend std::ostream &operator<<(std::ostream &_os, const DPath &_val);
24
25     public:
26         DPath();
27         ~DPath();
28         void Print(std::ostream &) const;
29         bool operator<(const DPath &rhs) const;
30
31         bool ConstructFromString(const char *path);
32
33         bool Match(DPath const &other) const;
34
35         static bool IsValid(const char *path);
36
37     private:
38         std::string Path;
39     };
40
41     inline std::ostream &operator<<(std::ostream &os, const DPath &val) {
42         os << val.Path;
43         return os;
44     }
45
46 } // end namespace gdcm
47
48 #endif // GDCMDPATH_H

```

## 11.285 gdcmDumper.h File Reference

#include "gdcmPrinter.h"

Include dependency graph for gdcmDumper.h:

### Classes

- class [gdcm::Dumper](#)  
*Codec class.*

### Namespaces

- namespace [gdcm](#)



## 11.286 gdcmDumper.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDUMPER_H
15 #define GDCMDUMPER_H
16
17 #include "gdcmPrinter.h"
18
19 namespace gdcm
20 {
21
22 // It's a sink there is no output
23 class GDCM_EXPORT Dumper : public Printer
24 {
25 public:
26     Dumper() { PrintStyle = CONDENSED_STYLE; }
27     ~Dumper() = default;
28 };
29
30 } // end namespace gdcm
31
32 #endif //GDCMDUMPER_H

```

## 11.287 gdcmEmptyMaskGenerator.h File Reference

```
#include "gdcmSubject.h"
```

Include dependency graph for gdcmEmptyMaskGenerator.h:

### Classes

- class [gdcm::EmptyMaskGenerator](#)

*[EmptyMaskGenerator](#) Main class to generate a Empty Mask [Series](#) from an input [Series](#). This class takes an input folder and generates a series of DICOM files in the specified output directory. This class handles multiples DICOM [Series](#) within the same input directory.*

### Namespaces

- namespace [gdcm](#)

## 11.288 gdcmEmptyMaskGenerator.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMEMPTYMASKGENERATOR_H
15 #define GDCMEMPTYMASKGENERATOR_H
16
17 #include "gdcmSubject.h"
18
19 namespace gdcm {
20 class GDCM_EXPORT EmptyMaskGenerator
21 {
22 public:
23     EmptyMaskGenerator();
24     ~EmptyMaskGenerator();
25
26     enum SOPClassUIDMode {
27         UseOriginalSOPClassUID = 0, // default
28         UseGrayscaleSecondaryImageStorage
29     };
30
31     void SetSOPClassUIDMode( SOPClassUIDMode mode );
32
33     void SetInputDirectory( const char * dirname );
34
35     void SetOutputDirectory( const char * dirname );
36
37     bool Execute();
38
39 private:
40     struct impl;
41     // PIMPL idiom
42     impl* pimpl;
43 };
44 } // end namespace gdcm
45 #endif //GDCMEMPTYMASKGENERATOR_H

```

## 11.289 gdcmEncapsulatedDocument.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmEncapsulatedDocument.h:

### Classes

- class [gdcm::EncapsulatedDocument](#)  
*EncapsulatedDocument.*

### Namespaces

- namespace [gdcm](#)

## 11.290 gdcmEncapsulatedDocument.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMENCAPSULATEDDOCUMENT_H
15 #define GDCMENCAPSULATEDDOCUMENT_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
24 class GDCM_EXPORT EncapsulatedDocument
25 {
26 public:
27     EncapsulatedDocument() = default;
28
29 private:
30 };
31
32 } // end namespace gdcm
33
34 #endif //GDCMENCAPSULATEDDOCUMENT_H

```

## 11.291 gdcmEquipmentManufacturer.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmEquipmentManufacturer.h:

### Classes

- class [gdcm::EquipmentManufacturer](#)

### Namespaces

- namespace [gdcm](#)

## 11.292 gdcmEquipmentManufacturer.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMEQUIPMENTMANUFACTURER_H
15 #define GDCMEQUIPMENTMANUFACTURER_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm {
20
21 class DataSet;
22 class GDCM_EXPORT EquipmentManufacturer {
23 public:
24     typedef enum {
25         UNKNOWN = 0,
26         FUJI,
27         GEMS,
28         HITACHI,
29         KODAK,
30         MARCONI,
31         PMS,
32         SIEMENS,
33         TOSHIBA,
34         AGFA,
35         SAMSUNG,
36         UIH
37     } Type;
38
39     static Type Compute(DataSet const &ds);
40
41     static const char *TypeToString(Type type);
42
43 private:
44     static EquipmentManufacturer::Type GuessFromPrivateAttributes(
45         DataSet const &ds);
46 };
47
48 } // end namespace gdcm
49
50 #endif // GDCMEQUIPMENTMANUFACTURER_H

```

## 11.293 gdcmFiducials.h File Reference

#include "gdcmFile.h"

Include dependency graph for gdcmFiducials.h:

### Classes

- class [gdcm::Fiducials](#)  
*Fiducials.*

### Namespaces

- namespace [gdcm](#)

## 11.294 gdcmFiducials.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFIDUCIALS_H
15 #define GDCMFIDUCIALS_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT Fiducials
22     {
23     public:
24         Fiducials() = default;
25     private:
26     };
27 } // end namespace gdcm
28
29 #endif //GDCMFIDUCIALS_H
```

## 11.295 gdcmFileAnonymizer.h File Reference

```
#include "gdcmSubject.h"
#include "gdcmEvent.h"
#include "gdcmTag.h"
#include "gdcmVL.h"
```

Include dependency graph for gdcmFileAnonymizer.h:

### Classes

- class [gdcm::FileAnonymizer](#)  
*FileAnonymizer.*

### Namespaces

- namespace [gdcm](#)

## 11.296 gdcmFileAnonymizer.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILEANONYMIZER_H
15 #define GDCMFILEANONYMIZER_H
16
17 #include "gdcmSubject.h"
18 #include "gdcmEvent.h"
19 #include "gdcmTag.h"
20 #include "gdcmVL.h"
21
22 namespace gdcm
23 {
24 class FileAnonymizerInternals;
25
26 class GDCM_EXPORT FileAnonymizer : public Subject
27 {
28 public:
29     FileAnonymizer();
30     ~FileAnonymizer() override;
31
32     void Empty( Tag const &t );
33
34     void Remove( Tag const &t );
35
36     void Replace( Tag const &t, const char *value_str );
37
38     void Replace( Tag const &t, const char *value_data, VL const &vl );
39
40     void SetInputFileName(const char *filename_native);
41
42     void SetOutputFileName(const char *filename_native);
43
44     bool Write();
45
46 private:
47     bool ComputeEmptyTagPosition();
48     bool ComputeRemoveTagPosition();
49     bool ComputeReplaceTagPosition();
50     FileAnonymizerInternals *Internals;
51 };
52
53 } // end namespace gdcm
54
55 #endif //GDCMFILEANONYMIZER_H

```

## 11.297 gdcmFileChangeTransferSyntax.h File Reference

```
#include "gdcmSubject.h"
```

```
#include "gdcmSmartPointer.h"
```

Include dependency graph for gdcmFileChangeTransferSyntax.h:

### Classes

- class [gdcm::FileChangeTransferSyntax](#)  
*FileChangeTransferSyntax.*

## Namespaces

- namespace [gdcm](#)

## 11.298 gdcmFileChangeTransferSyntax.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILECHANGETRANSFERSYNTAX_H
15 #define GDCMFILECHANGETRANSFERSYNTAX_H
16
17 #include "gdcmSubject.h"
18 #include "gdcmSmartPointer.h"
19
20 namespace gdcm
21 {
22 class FileChangeTransferSyntaxInternals;
23 class ImageCodec;
24 class TransferSyntax;
25
26 class GDCM_EXPORT FileChangeTransferSyntax : public Subject
27 {
28 public:
29     FileChangeTransferSyntax();
30     ~FileChangeTransferSyntax() override;
31
32     void SetInputFileName(const char *filename_native);
33
34     void SetOutputFileName(const char *filename_native);
35
36     bool Change();
37
38     void SetTransferSyntax( TransferSyntax const & ts );
39
40     ImageCodec * GetCodec();
41
42     static SmartPointer<FileChangeTransferSyntax> New() { return new FileChangeTransferSyntax; }
43 private:
44     bool InitializeCopy();
45     bool UpdateCompressionLevel(double level);
46     FileChangeTransferSyntaxInternals *Internals;
47 };
48
49 } // end namespace gdcm
50
51 #endif //GDCMFILEANONYMIZER_H

```

## 11.299 gdcmFileDecompressLookupTable.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmFile.h"
#include "gdcmPixmap.h"

```

Include dependency graph for gdcmFileDecompressLookupTable.h:

## Classes

- class [gdcm::FileDecompressLookupTable](#)  
*FileDecompressLookupTable class.*

## Namespaces

- namespace [gdcm](#)

## 11.300 gdcmFileDecompressLookupTable.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILEDECOMPRESSLOOKUPTABLE_H
15 #define GDCMFILEDECOMPRESSLOOKUPTABLE_H
16
17 #include "gdcmSubject.h"
18 #include "gdcmFile.h"
19 #include "gdcmPixmap.h"
20
21 namespace gdcm
22 {
23
24 class DataElement;
25 class GDCM_EXPORT FileDecompressLookupTable : public Subject
26 {
27 public:
28     FileDecompressLookupTable() = default;
29     ~FileDecompressLookupTable() override = default;
30
31     bool Change();
32
33     void SetFile(const File& f) { F = f; }
34     File &GetFile() { return *F; }
35
36     const Pixmap& GetPixmap()const { return *PixelData; }
37     Pixmap& GetPixmap() { return *PixelData; }
38     void SetPixmap(Pixmap const &img) { PixelData = img; }
39
40 protected:
41
42 private:
43     SmartPointer<File> F;
44     SmartPointer<Pixmap> PixelData;
45 };
46
47 } // end namespace gdcm
48
49 #endif //GDCMFILEDECOMPRESSLOOKUPTABLE_H

```

## 11.301 gdcmFileDerivation.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmFileDerivation.h:



## Classes

- class [gdcm::FileDerivation](#)  
*FileDerivation* class.

## Namespaces

- namespace [gdcm](#)

## 11.302 gdcmFileDerivation.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILEDERIVATION_H
15 #define GDCMFILEDERIVATION_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
21
22 class FileDerivationInternals;
23 class DataSet;
24
25 class GDCM_EXPORT FileDerivation
26 {
27 public:
28     FileDerivation();
29     ~FileDerivation();
30
31     bool AddReference(const char *referencedsopclassuid, const char *referencedsopinstanceuid);
32
33     // CID 7202 Source Image Purposes of Reference
34     // { "DCM",121320,"Uncompressed predecessor"},
35
36     void SetPurposeOfReferenceCodeSequenceCodeValue(unsigned int codevalue);
37
38     // CID 7203 Image Derivation
39     // { "DCM",113040,"Lossy Compression" },
40
41     void SetDerivationCodeSequenceCodeValue(unsigned int codevalue);
42
43     void SetDerivationDescription( const char *dd );
44
45     void SetAppendDerivationHistory(bool b);
46
47     bool Derive();
48
49     void SetFile(const File& f) { F = f; }
50     File &GetFile() { return *F; }
51     const File &GetFile() const { return *F; }
52
53 protected:
54     bool AddDerivationDescription();
55     bool AddSourceImageSequence();
56     bool AddPurposeOfReferenceCodeSequence(DataSet &ds);
57 private:

```

```

85     SmartPointer<File> F;
86     FileDerivationInternals *Internals;
87 };
88
96 } // end namespace gdcm
97
98 #endif //GDCMFILEDERIVATION_H

```

## 11.303 gdcmFileExplicitFilter.h File Reference

#include "gdcmFile.h"

Include dependency graph for gdcmFileExplicitFilter.h:

### Classes

- class [gdcm::FileExplicitFilter](#)  
*FileExplicitFilter* class.

### Namespaces

- namespace [gdcm](#)

## 11.304 gdcmFileExplicitFilter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILEEXPLICITFILTER_H
15 #define GDCMFILEEXPLICITFILTER_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
21     class Dicts;
22
23     class GDCM_EXPORT FileExplicitFilter
24     {
25     public:
26         FileExplicitFilter():F(new
27             File),ChangePrivateTags(false),UseVRUN(true),RecomputeItemLength(false),RecomputeSequenceLength(false) {}
28         ~FileExplicitFilter() = default;
29
30         void SetChangePrivateTags(bool b) { ChangePrivateTags = b;}
31
32         void SetUseVRUN(bool b) { UseVRUN = b; }
33
34         void SetRecomputeItemLength(bool b);

```

```

52 void SetRecomputeSequenceLength(bool b);
53
55
57 bool Change();
58
60 void SetFile(const File& f) { F = f; }
61 File &GetFile() { return *F; }
62
63 protected:
64 bool ProcessDataSet(DataSet &ds, Dicts const &dicts);
65 bool ChangeFMI();
66
67 private:
68 SmartPointer<File> F;
69 bool ChangePrivateTags;
70 bool UseVRUN;
71 bool RecomputeItemLength;
72 bool RecomputeSequenceLength;
73 };
74
75
76 } // end namespace gdcm
77
78 #endif //GDCMFILEEXPLICITFILTER_H

```

## 11.305 gdcmFileStreamer.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmSmartPointer.h"
Include dependency graph for gdcmFileStreamer.h:

```

### Classes

- class [gdcm::FileStreamer](#)  
*FileStreamer.*

### Namespaces

- namespace [gdcm](#)

## 11.306 gdcmFileStreamer.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFILESTREAMER_H
15 #define GDCMFILESTREAMER_H
16

```

```

17 #include "gdcmSubject.h"
18 #include "gdcmSmartPointer.h"
19
20 namespace gdcm
21 {
22   class FileStreamerInternals;
23
24   class Tag;
25   class PrivateTag;
26
27   class GDCM_EXPORT FileStreamer : public Subject
28   {
29   public:
30     FileStreamer();
31     ~FileStreamer() override;
32
33     void SetTemplateFileName(const char *filename_native);
34
35     // Decide to check template or not (default: false)
36     void CheckTemplateFileName(bool check);
37
38     void SetOutputFileName(const char *filename_native);
39
40     bool CheckDataElement( const Tag & t );
41
42     bool StartDataElement( const Tag & t );
43     bool AppendToDataElement( const Tag & t, const char *array, size_t len );
44     bool StopDataElement( const Tag & t );
45     bool ReserveDataElement( size_t len );
46
47     bool StartGroupDataElement( const PrivateTag & pt, size_t maxsize = 0, uint8_t startoffset = 0 );
48     bool AppendToGroupDataElement( const PrivateTag & pt, const char *array, size_t len );
49     bool StopGroupDataElement( const PrivateTag & pt );
50     bool ReserveGroupDataElement( unsigned short ndataelement );
51
52     static SmartPointer<FileStreamer> New() { return new FileStreamer; }
53
54 private:
55     bool InitializeCopy();
56     FileStreamerInternals *Internals;
57 };
58 } // end namespace gdcm
59 #endif //GDCMFILESTREAMER_H

```

## 11.307 gdcmIconImage.h File Reference

#include "gdcmBitmap.h"

Include dependency graph for gdcmIconImage.h: This graph shows which files directly or indirectly include this file:

### Namespaces

- namespace [gdcm](#)

### Typedefs

- typedef Bitmap [gdcm::IconImage](#)

## 11.308 gdcmIcnImage.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMICONIMAGE_H
15 #define GDCMICONIMAGE_H
16
17 #if 0
18 #include "gdcmObject.h"
19 #include "gdcmDataElement.h"
20 #include "gdcmPhotometricInterpretation.h"
21 #include "gdcmPixelFormat.h"
22 #include "gdcmTransferSyntax.h"
23
24 #include <vector>
25
26 namespace gdcm
27 {
28
29 class GDCM_EXPORT IconImage : public Object
30 {
31 public:
32     IconImage();
33     ~IconImage();
34     void Print(std::ostream &)const {}
35
36     void SetTransferSyntax(TransferSyntax const &ts) {
37         TS = ts;
38     }
39     const TransferSyntax &GetTransferSyntax()const {
40         return TS;
41     }
42     void SetDataElement(DataElement const &de) {
43         PixelData = de;
44     }
45     const DataElement& GetDataElement()const { return PixelData; }
46
47     void SetColumns(unsigned int col) { SetDimension(0,col); }
48     void SetRows(unsigned int rows) { SetDimension(1,rows); }
49     void SetDimension(unsigned int idx, unsigned int dim);
50     int GetColumns()const { return Dimensions[0]; }
51     int GetRows()const { return Dimensions[1]; }
52     // Get/Set PixelFormat
53     const PixelFormat &GetPixelFormat()const
54     {
55         return PF;
56     }
57     void SetPixelFormat(PixelFormat const &pf)
58     {
59         PF = pf;
60     }
61
62     const PhotometricInterpretation &GetPhotometricInterpretation() const;
63     void SetPhotometricInterpretation(PhotometricInterpretation const &pi);
64
65     bool IsEmpty()const { return Dimensions.size() == 0; }
66     void Clear();
67
68     bool GetBuffer(char *buffer) const;
69
70 private:
71     TransferSyntax TS;
72     PixelFormat PF; // SamplesPerPixel, BitsAllocated, BitsStored, HighBit, PixelRepresentation
73     PhotometricInterpretation PI;
74     std::vector<unsigned int> Dimensions; // Col/Row
75     std::vector<double> Spacing; // PixelAspectRatio ?
76     DataElement PixelData; // copied from 7fe0,0010

```

```

81  static const unsigned int NumberOfDimensions = 2;
82  };
83
84  } // end namespace gdc
85  #endif
86  #include "gdcBitmap.h"
87
88  namespace gdc
89  {
90    //class GDCM_EXPORT IconImage : public QPixmap {};
91    typedef Bitmap IconImage;
92  }
93
94  #endif //GDCMICONIMAGE_H

```

## 11.309 gdcmlconImageFilter.h File Reference

```

#include "gdcFile.h"
#include "gdcIconImage.h"

```

Include dependency graph for gdcmlconImageFilter.h:

### Classes

- class `gdc::IconImageFilter`  
*IconImageFilter.*

### Namespaces

- namespace `gdc`

## 11.310 gdcmlconImageFilter.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMICONIMAGEFILTER_H
15 #define GDCMICONIMAGEFILTER_H
16
17 #include "gdcFile.h"
18 #include "gdcIconImage.h"
19
20 namespace gdc
21 {
22 class IconImageFilterInternals;
23
24 class GDCM_EXPORT IconImageFilter
25 {
26 public:

```

```

52  IconImageFilter();
53  ~IconImageFilter();
54
56  void SetFile(const File& f) { F = f; }
57  File &GetFile() { return *F; }
58  const File &GetFile()const { return *F; }
59
61  bool Extract();
62
64  unsigned int GetNumberOfIconImages() const;
65  IconImage& GetIconImage( unsigned int i ) const;
66
67 protected:
68  void ExtractIconImages();
69  void ExtractVeproIconImages();
70
71 private:
72  SmartPointer<File> F;
73  IconImageFilterInternals *Internals;
74 };
75
76 } // end namespace gdcml
77
78 #endif //GDCMICONIMAGEFILTER_H

```

## 11.311 gdcmlconImageGenerator.h File Reference

```

#include "gdcmlPixmap.h"
#include "gdcmlIconImage.h"

```

Include dependency graph for gdcmlconImageGenerator.h:

### Classes

- class [gdcml::IconImageGenerator](#)  
*IconImageGenerator.*

### Namespaces

- namespace [gdcml](#)

## 11.312 gdcmlconImageGenerator.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMICONIMAGEGENERATOR_H
15 #define GDCMICONIMAGEGENERATOR_H
16

```

```

17 #include "gdcmPixmap.h"
18 #include "gdcmIconImage.h"
19
20 namespace gdcm
21 {
22     class IconImageGeneratorInternals;
23     class GDCM_EXPORT IconImageGenerator
24     {
25     public:
26         IconImageGenerator();
27         ~IconImageGenerator();
28
29         void SetPixmap(const Pixmap& p) { P = p; }
30         Pixmap &GetPixmap() { return *P; }
31         const Pixmap &GetPixmap() const { return *P; }
32
33         void SetOutputDimensions(const unsigned int dims[2]);
34
35         void SetPixelMinMax(double min, double max);
36
37         void AutoPixelMinMax(bool b);
38
39         void ConvertRGBToPaletteColor(bool b);
40
41         void SetOutsideValuePixel(double v);
42
43         bool Generate();
44
45         const IconImage& GetIconImage() const { return *I; }
46
47     protected:
48
49     private:
50         void BuildLUT( Bitmap & bitmap, unsigned int maxcolor );
51
52         SmartPointer<Pixmap> P;
53         SmartPointer<IconImage> I;
54         IconImageGeneratorInternals *Internals;
55     };
56 } // end namespace gdcm
57 #endif //GDCMICONIMAGEGENERATOR_H

```

## 11.313 gdcmImage.h File Reference

```

#include "gdcmPixmap.h"
#include <vector>

```

Include dependency graph for gdcmImage.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Image](#)  
*Image*.

### Namespaces

- namespace [gdcm](#)



## 11.314 gdcmImage.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGE_H
15 #define GDCMIMAGE_H
16
17 #include "gdcmPixmap.h"
18
19 #include <vector>
20
21 namespace gdcm
22 {
23
24     class GDCM_EXPORT Image : public Pixmap
25     {
26     public:
27         Image () : Spacing(), SC(), Intercept(0), Slope(1) {
28             //DirectionCosines.resize(6);
29             Origin.resize( 3 /*NumberOfDimensions*/ ); // fill with 0
30             DirectionCosines.resize( 6 ); // fill with 0
31             DirectionCosines[0] = 1;
32             DirectionCosines[4] = 1;
33             Spacing.resize( 3 /*NumberOfDimensions*/, 1 ); // fill with 1
34         }
35         ~Image() override = default;
36
37         const double *GetSpacing() const;
38         double GetSpacing(unsigned int idx) const;
39         void SetSpacing(const double spacing[3]);
40         void SetSpacing(unsigned int idx, double spacing);
41
42         const double *GetOrigin() const;
43         double GetOrigin(unsigned int idx) const;
44         void SetOrigin(const float origin[3]);
45         void SetOrigin(const double origin[3]);
46         void SetOrigin(unsigned int idx, double ori);
47
48         const double *GetDirectionCosines() const;
49         double GetDirectionCosines(unsigned int idx) const;
50         void SetDirectionCosines(const float dircos[6]);
51         void SetDirectionCosines(const double dircos[6]);
52         void SetDirectionCosines(unsigned int idx, double dircos);
53
54         void Print(std::ostream &os) const override;
55
56         void SetIntercept(double intercept) { Intercept = intercept; }
57         double GetIntercept()const { return Intercept; }
58
59         void SetSlope(double slope) { Slope = slope; }
60         double GetSlope()const { return Slope; }
61
62     private:
63         std::vector<double> Spacing;
64         std::vector<double> Origin;
65         std::vector<double> DirectionCosines;
66
67         // I believe the following 3 ivars can be derived from TS ...
68         SwapCode SC;
69         double Intercept;
70         double Slope;
71     };
72
73 } // end namespace gdcm
74
75 #endif //GDCMIMAGE_H

```

## 11.315 gdcmImageApplyLookupTable.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageApplyLookupTable.h:

### Classes

- class `gdcm::ImageApplyLookupTable`  
*ImageApplyLookupTable* class.

### Namespaces

- namespace `gdcm`

## 11.316 gdcmImageApplyLookupTable.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGEAPPLYLOOKUPTABLE_H
15 #define GDCMIMAGEAPPLYLOOKUPTABLE_H
16
17 #include "gdcmImageToImageFilter.h"
18
19 namespace gdcm
20 {
21
22 class DataElement;
23
24 class GDCM_EXPORT ImageApplyLookupTable : public ImageToImageFilter
25 {
26 public:
27     ImageApplyLookupTable();
28     ~ImageApplyLookupTable();
29
30     bool Apply();
31
32     void SetRGB8(bool b);
33
34 protected:
35
36 private:
37     struct impl;
38     // PIMPL idiom
39     impl* pimpl;
40 };
41
42 } // end namespace gdcm
43
44 #endif //GDCMIMAGEAPPLYLOOKUPTABLE_H
```

## 11.317 gdcmImageChangePhotometricInterpretation.h File Reference

```
#include "gdcmImageToImageFilter.h"
#include "gdcmPhotometricInterpretation.h"
#include <limits>
Include dependency graph for gdcmImageChangePhotometricInterpretation.h:
```

### Classes

- class [gdcm::ImageChangePhotometricInterpretation](#)  
*ImageChangePhotometricInterpretation* class.

### Namespaces

- namespace [gdcm](#)

### Functions

- template<typename T >  
static T [gdcm::Clamp](#) (int v)
- template<typename T >  
static int [gdcm::Round](#) (T x)

## 11.318 gdcmImageChangePhotometricInterpretation.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGECHANGEPHOTOMETRICINTERPRETATION_H
15 #define GDCMIMAGECHANGEPHOTOMETRICINTERPRETATION_H
16
17 #include "gdcmImageToImageFilter.h"
18 #include "gdcmPhotometricInterpretation.h"
19 #include <limits>
20
21 namespace gdcm
22 {
23
24 class DataElement;
25 class GDCM_EXPORT ImageChangePhotometricInterpretation : public ImageToImageFilter
26 {
27 public:
28     ImageChangePhotometricInterpretation():PI() {}
29     ~ImageChangePhotometricInterpretation() = default;
30
31     void SetPhotometricInterpretation(PhotometricInterpretation const &pi) { PI = pi; }
```

```

37  const PhotometricInterpretation &GetPhotometricInterpretation()const { return PI; }
38
40  bool Change();
41
42  template <typename T>
43  static void RGB2YBR(T ybr[3], const T rgb[3], unsigned short storedbits = 8);
44  template <typename T>
45  static void YBR2RGB(T rgb[3], const T ybr[3], unsigned short storedbits = 8);
46
47  protected:
48  bool ChangeMonochrome();
49  bool ChangeYBR2RGB();
50  bool ChangeRGB2YBR();
51
52  private:
53  PhotometricInterpretation PI;
54  };
55
56  template <typename T>
57  static inline int Round(T x)
58  {
59  return (int) (x+0.5);
60  }
61
62  template <typename T>
63  static inline T Clamp(int v)
64  {
65  assert( std::numeric_limits<T>::min() == 0 );
66  return v < 0 ? 0 : (v > std::numeric_limits<T>::max() ? std::numeric_limits<T>::max() : v);
67  }
68
69  template <typename T>
70  void ImageChangePhotometricInterpretation::RGB2YBR(T ybr[3], const T rgb[3], unsigned short storedbits)
71  {
72  // Implementation details, since the equations from:
73  // http://dicom.nema.org/medical/dicom/current/output/chtml/part03/sect_C.7.6.3.html#sect_C.7.6.3.1.2
74  // are rounded to the 4th decimal precision, prefer the exact equation from the original document at:
75  // CCIR Recommendation 601-2, also found in T.871 (Section §7, page 4)
76  const double R = rgb[0];
77  const double G = rgb[1];
78  const double B = rgb[2];
79  assert( storedbits <= sizeof(T) * 8 );
80  const int halffullscale = 1 << (storedbits - 1);
81  const int Y = Round( 0.299 * R + 0.587 * G + 0.114 * B );
82  const int CB = Round((-0.299 * R - 0.587 * G + 0.886 * B)/1.772 + halffullscale);
83  const int CR = Round(( 0.701 * R - 0.587 * G - 0.114 * B)/1.402 + halffullscale);
84  ybr[0] = Clamp<T>(Y );
85  ybr[1] = Clamp<T>(CB);
86  ybr[2] = Clamp<T>(CR);
87  }
88
89  template <typename T>
90  void ImageChangePhotometricInterpretation::YBR2RGB(T rgb[3], const T ybr[3], unsigned short storedbits)
91  {
92  const double Y = ybr[0];
93  const double Cb = ybr[1];
94  const double Cr = ybr[2];
95  assert( storedbits <= sizeof(T) * 8 );
96  const int halffullscale = 1 << (storedbits - 1);
97  const int R = Round(Y + 1.402 * (Cr-halffullscale) );
98  const int G = Round(Y -( 0.114 * 1.772 * (Cb-halffullscale) + 0.299 * 1.402 * (Cr-halffullscale))/0.587);
99  const int B = Round(Y + 1.772 * (Cb-halffullscale) );
100  rgb[0] = Clamp<T>(R);
101  rgb[1] = Clamp<T>(G);
102  rgb[2] = Clamp<T>(B);
103  }
104 } // end namespace gdcm
105
106 #endif //GDCMIMAGECHANGEPHOTOMETRICINTERPRETATION_H

```

## 11.319 gdcmImageChangePlanarConfiguration.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageChangePlanarConfiguration.h:

## Classes

- class [gdcm::ImageChangePlanarConfiguration](#)  
*ImageChangePlanarConfiguration* class.

## Namespaces

- namespace [gdcm](#)

## 11.320 gdcmImageChangePlanarConfiguration.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGECHANGEPLANARCONFIGURATION_H
15 #define GDCMIMAGECHANGEPLANARCONFIGURATION_H
16
17 #include "gdcmImageToImageFilter.h"
18
19 namespace gdcm
20 {
21
22 class DataElement;
23
24 class GDCM_EXPORT ImageChangePlanarConfiguration : public ImageToImageFilter
25 {
26 public:
27     ImageChangePlanarConfiguration():PlanarConfiguration(0) {}
28     ~ImageChangePlanarConfiguration() = default;
29
30     void SetPlanarConfiguration(unsigned int pc) { PlanarConfiguration = pc; }
31     unsigned int GetPlanarConfiguration()const { return PlanarConfiguration; }
32
33     template <typename T>
34     static size_t RGBPlanesToRGBPixels(T *out, const T *r, const T *g, const T *b, size_t s);
35
36     template <typename T>
37     static size_t RGBPixelsToRGBPlanes(T *r, T *g, T *b, const T* rgb, size_t s);
38
39     bool Change();
40
41 protected:
42
43 private:
44     unsigned int PlanarConfiguration;
45 };
46
47 template <typename T>
48 size_t ImageChangePlanarConfiguration::RGBPlanesToRGBPixels(T *out, const T *r, const T *g, const T *b,
49     size_t s)
50 {
51     T *pout = out;
52     for(size_t i = 0; i < s; ++i )
53     {
54         *pout++ = *r++;
55         *pout++ = *g++;
56         *pout++ = *b++;
57     }
58 }
59
60
61
62
63
64
65
66
67
68

```

```

69  assert( (size_t)(pout - out) == 3 * s );
70  return pout - out;
71 }
72
73 template <typename T>
74 size_t ImageChangePlanarConfiguration::RGBPixelsToRGBPlanes(T *r, T *g, T *b, const T *rgb, size_t s)
75 {
76     const T *prgb = rgb;
77     for(size_t i = 0; i < s; ++i )
78     {
79         *r++ = *prgb++;
80         *g++ = *prgb++;
81         *b++ = *prgb++;
82     }
83     assert( (size_t)(prgb - rgb) == 3 * s );
84     return prgb - rgb;
85 }
86
87
88 } // end namespace gdcM
89
90 #endif //GDCMIMAGECHANGEPLANARCONFIGURATION_H

```

## 11.321 gdcmImageChangeTransferSyntax.h File Reference

```

#include "gdcmImageToImageFilter.h"
#include "gdcmTransferSyntax.h"

```

Include dependency graph for gdcmImageChangeTransferSyntax.h:

### Classes

- class [gdcm::ImageChangeTransferSyntax](#)  
*ImageChangeTransferSyntax* class.

### Namespaces

- namespace [gdcm](#)

## 11.322 gdcmImageChangeTransferSyntax.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGECHANGETRANSFERSYNTAX_H
15 #define GDCMIMAGECHANGETRANSFERSYNTAX_H
16
17 #include "gdcmImageToImageFilter.h"
18 #include "gdcmTransferSyntax.h"

```

```

19
20 namespace gdcm
21 {
22
23 class DataElement;
24 class ImageCodec;
25
26 class GDCM_EXPORT ImageChangeTransferSyntax : public ImageToImageFilter
27 {
28 public:
29
30     ImageChangeTransferSyntax():TS(TransferSyntax::TS_END),Force(false),CompressIconImage(false),UserCode(nullptr)
31     {}
32
33     ~ImageChangeTransferSyntax() = default;
34
35     void SetTransferSyntax(const TransferSyntax &ts) { TS = ts; }
36     const TransferSyntax &GetTransferSyntax()const { return TS; }
37
38     bool Change();
39
40     void SetCompressIconImage(bool b) { CompressIconImage = b; }
41
42     void SetForce( bool f ) { Force = f; }
43
44     void SetUserCode(ImageCodec *ic) { UserCodec = ic; }
45
46 protected:
47     bool TryJPEGCodec(const DataElement &pixelde, Bitmap const &input, Bitmap &output);
48     bool TryJPEG2000Codec(const DataElement &pixelde, Bitmap const &input, Bitmap &output);
49     bool TryJPEGLSCodec(const DataElement &pixelde, Bitmap const &input, Bitmap &output);
50     bool TryRAWCodec(const DataElement &pixelde, Bitmap const &input, Bitmap &output);
51     bool TryRLECodec(const DataElement &pixelde, Bitmap const &input, Bitmap &output);
52
53 private:
54     TransferSyntax TS;
55     bool Force;
56     bool CompressIconImage;
57
58     ImageCodec *UserCode;
59 };
60
61 } // end namespace gdcm
62
63 #endif //GDCMIMAGECHANGETRANSFERSYNTAX_H

```

## 11.323 gdcmImageCodec.h File Reference

```

#include "gdcmCodec.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmLookupTable.h"
#include "gdcmSmartPointer.h"
#include "gdcmPixelFormat.h"

```

Include dependency graph for gdcmImageCodec.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::ImageCodec](#)  
*ImageCodec.*

### Namespaces

- namespace [gdcm](#)

## 11.324 gdcmlImageCodec.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGECODEC_H
15 #define GDCMIMAGECODEC_H
16
17 #include "gdcmlCodec.h"
18 #include "gdcmlPhotometricInterpretation.h"
19 #include "gdcmlLookupTable.h"
20 #include "gdcmlSmartPointer.h"
21 #include "gdcmlPixelFormat.h"
22
23 namespace gdcml
24 {
25
26 class GDCM_EXPORT ImageCodec : public Codec
27 {
28     friend class ImageChangePhotometricInterpretation;
29 public:
30     ImageCodec();
31     ~ImageCodec() override;
32     bool CanCode(TransferSyntax const &)const override { return false; }
33     bool CanDecode(TransferSyntax const &)const override { return false; }
34     bool Decode(DataElement const &is_, DataElement &os) override;
35     bool IsLossy() const;
36     void SetLossyFlag(bool l);
37     bool GetLossyFlag() const;
38
39     virtual bool GetHeaderInfo(std::istream &is_, TransferSyntax &ts);
40
41     virtual ImageCodec * Clone() const = 0;
42
43 protected:
44     bool DecodeByStreams(std::istream &is_, std::ostream &os) override;
45     virtual bool IsValid(PhotometricInterpretation const &pi);
46 public:
47     unsigned int GetPlanarConfiguration()const
48     {
49         return PlanarConfiguration;
50     }
51     void SetPlanarConfiguration(unsigned int pc)
52     {
53         assert( pc == 0 || pc == 1 );
54         PlanarConfiguration = pc;
55     }
56
57     PixelFormat &GetPixelFormat()
58     {
59         return PF;
60     }
61     const PixelFormat &GetPixelFormat()const
62     {
63         return PF;
64     }
65     virtual void SetPixelFormat(PixelFormat const &pf)
66     {
67         PF = pf;
68     }
69     const PhotometricInterpretation &GetPhotometricInterpretation() const;
70     void SetPhotometricInterpretation(PhotometricInterpretation const &pi);
71
72     bool GetNeedByteSwap()const
73     {
74         return NeedByteSwap;
75     }
76 }

```



```

81 void SetNeedByteSwap(bool b)
82 {
83     NeedByteSwap = b;
84 }
85 void SetNeedOverlayCleanup(bool b)
86 {
87     NeedOverlayCleanup = b;
88 }
89 void SetLUT(LookupTable const &lut)
90 {
91     LUT = SmartPointer<LookupTable>( const_cast<LookupTable*>(&lut) );
92 }
93 const LookupTable &GetLUT()const
94 {
95     return *LUT;
96 }
97
98 void SetDimensions(const unsigned int d[3]);
99 void SetDimensions(const std::vector<unsigned int> &d);
100 const unsigned int *GetDimensions()const { return Dimensions; }
101 void SetNumberOfDimensions(unsigned int dim);
102 unsigned int GetNumberOfDimensions() const;
103
104 bool CleanupUnusedBits(char * data, size_t datalen);
105
106 protected:
107     // Streaming (write) API:
108     friend class FileChangeTransferSyntax;
109     virtual bool StartEncode( std::ostream & os );
110     virtual bool IsRowEncoder();
111     virtual bool IsFrameEncoder();
112     virtual bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen );
113     virtual bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen );
114     virtual bool StopEncode( std::ostream & os);
115
116 protected:
117     bool RequestPlanarConfiguration;
118     bool RequestPaddedCompositePixelCode;
119 private:
120     unsigned int PlanarConfiguration;
121     PhotometricInterpretation PI;
122     PixelFormat PF;
123     bool NeedByteSwap;
124     bool NeedOverlayCleanup;
125
126     typedef SmartPointer<LookupTable> LUTPtr;
127     LUTPtr LUT;
128     unsigned int Dimensions[3]; // FIXME
129     unsigned int NumberOfDimensions;
130     bool LossyFlag;
131
132     bool DoOverlayCleanup(std::istream &is_, std::ostream &os);
133     bool DoByteSwap(std::istream &is_, std::ostream &os);
134     bool DoYBR(std::istream &is_, std::ostream &os);
135     bool DoYBRFull422(std::istream &is_, std::ostream &os);
136     bool DoPlanarConfiguration(std::istream &is_, std::ostream &os);
137     bool DoSimpleCopy(std::istream &is_, std::ostream &os);
138     bool DoPaddedCompositePixelCode(std::istream &is_, std::ostream &os);
139     bool DoInvertMonochrome(std::istream &is_, std::ostream &os);
140
141     //template <typename T>
142     //bool DoInvertPlanarConfiguration(T *output, const T *input, uint32_t length);
143 };
144
145 } // end namespace gdcm
146
147 #endif //GDCMIMAGECODEC_H

```

## 11.325 gdcmImageConverter.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmImageConverter.h:

## Classes

- class [gdcm::ImageConverter](#)  
*Image Converter.*

## Namespaces

- namespace [gdcm](#)

## 11.326 gdcmImageConverter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMIMAGECONVERTER_H
16 #define GDCMIMAGECONVERTER_H
17
18 #include "gdcmTypes.h"
19
20 namespace gdcm
21 {
22
23 class Image;
24
25 class GDCM_EXPORT ImageConverter
26 {
27 public:
28     ImageConverter();
29     ~ImageConverter();
30
31     void SetInput(Image const &input);
32     const Image& GetOutput() const;
33
34     void Convert();
35
36 private:
37     Image *Input;
38     Image *Output;
39 };
40
41 } // end namespace gdcm
42
43 #endif //GDCMIMAGECONVERTER_H

```

## 11.327 gdcmImageFragmentSplitter.h File Reference

```
#include "gdcmImageToImageFilter.h"
```

Include dependency graph for gdcmImageFragmentSplitter.h:

## Classes

- class [gdcm::ImageFragmentSplitter](#)  
*ImageFragmentSplitter* class.

## Namespaces

- namespace [gdcm](#)

## 11.328 gdcmImageFragmentSplitter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGEFRAGMENTSPLITTER_H
15 #define GDCMIMAGEFRAGMENTSPLITTER_H
16
17 #include "gdcmImageToImageFilter.h"
18
19 namespace gdcm
20 {
21
22 class DataElement;
23
24 class GDCM_EXPORT ImageFragmentSplitter : public ImageToImageFilter
25 {
26 public:
27     ImageFragmentSplitter():FragmentSizeMax(0),Force(false) {}
28     ~ImageFragmentSplitter() = default;
29
30     bool Split();
31
32     void SetFragmentSizeMax(unsigned int fragsize);
33     unsigned int GetFragmentSizeMax()const { return FragmentSizeMax; }
34
35     void SetForce( bool f ) { Force = f; }
36
37 protected:
38
39 private:
40     unsigned int FragmentSizeMax;
41     bool Force;
42 };
43
44 } // end namespace gdcm
45
46 #endif //GDCMIMAGEFRAGMENTSPLITTER_H

```

## 11.329 gdcmImageHelper.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmTag.h"

```

```
#include <vector>
#include "gdcmPixelFormat.h"
#include "gdcmPhotometricInterpretation.h"
#include "gdcmSmartPointer.h"
#include "gdcmLookupTable.h"
```

Include dependency graph for gdcmImageHelper.h:

## Classes

- class [gdcm::ImageHelper](#)  
*ImageHelper* (internal class, not intended for user level)
- struct [gdcm::RealWorldValueMappingContent](#)

## Namespaces

- namespace [gdcm](#)

## 11.330 gdcmImageHelper.h

[Go to the documentation of this file.](#)

```
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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGEHELPER_H
15 #define GDCMIMAGEHELPER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTag.h"
19 #include <vector>
20 #include "gdcmPixelFormat.h"
21 #include "gdcmPhotometricInterpretation.h"
22 #include "gdcmSmartPointer.h"
23 #include "gdcmLookupTable.h"
24
25 namespace gdcm
26 {
27
28 class MediaStorage;
29 class DataSet;
30 class File;
31 class Image;
32 class Pixmap;
33 class ByteValue;
34
35 // minimal struct:
36 struct RealWorldValueMappingContent {
37     double RealWorldValueIntercept;
38     double RealWorldValueSlope;
39     // http://dicom.nema.org/MEDICAL/DICOM/2014c/output/chtml/part16/sect_CID_7181.html
40     std::string CodeValue;
41     std::string CodeMeaning;
42 };
43
```

```

59 class GDCM_EXPORT ImageHelper
60 {
61 public:
62     static void SetForceRescaleInterceptSlope(bool);
63     static bool GetForceRescaleInterceptSlope();
64
65     static void SetPMSRescaleInterceptSlope(bool);
66     static bool GetPMSRescaleInterceptSlope();
67
68     static void SetForcePixelSpacing(bool);
69     static bool GetForcePixelSpacing();
70
71     static std::vector<unsigned int> GetDimensionsValue(const File& f);
72     static void SetDimensionsValue(File& f, const Pixmap & img);
73
74     static PixelFormat GetPixelFormatValue(const File& f);
75
76     static std::vector<double> GetRescaleInterceptSlopeValue(File const & f);
77     static void SetRescaleInterceptSlopeValue(File & f, const Image & img);
78
79     // read only for now
80     static bool GetRealWorldValueMappingContent(File const & f, RealWorldValueMappingContent & rwvmc);
81
82     static std::vector<double> GetOriginValue(File const & f);
83     static void SetOriginValue(DataSet & ds, const Image & img);
84
85     static std::vector<double> GetDirectionCosinesValue(File const & f);
86     // FIXME: There is a major issue for image with multiple IOP (eg. Enhanced * Image Storage).
87     static void SetDirectionCosinesValue(DataSet & ds, const std::vector<double> & dircos);
88
89     static std::vector<double> GetSpacingValue(File const & f);
90     static void SetSpacingValue(DataSet & ds, const std::vector<double> & spacing);
91
92     static bool ComputeSpacingFromImagePositionPatient(const std::vector<double> & imageposition,
93                                                         std::vector<double> & spacing);
94
95     static bool GetDirectionCosinesFromDataSet(DataSet const & ds, std::vector<double> & dircos);
96
97     //functions to get more information from a file
98     //useful for the stream image reader, which fills in necessary image information
99     //distinctly from the reader-style data input
100     static PhotometricInterpretation GetPhotometricInterpretationValue(File const& f);
101     //returns the configuration of colors in a plane, either RGB RGB RGB or RRR GGG BBB
102     static unsigned int GetPlanarConfigurationValue(const File& f);
103
104     static SmartPointer<LookupTable> GetLUT(File const& f);
105
106     // Moved from PixmapReader to here. Generally used for photometric interpretation.
107     static const ByteValue* GetPointerFromElement(Tag const &tag, File const& f);
108
109     static MediaStorage ComputeMediaStorageFromModality(const char *modality,
110                                                         unsigned int dimension = 2, PixelFormat const & pf = PixelFormat(),
111                                                         PhotometricInterpretation const & pi = PhotometricInterpretation(),
112                                                         double rescaleintercept = 0, double rescaleslope = 1 );
113
114 protected:
115     static Tag GetSpacingTagFromMediaStorage(MediaStorage const &ms);
116     static Tag GetZSpacingTagFromMediaStorage(MediaStorage const &ms);
117
118 private:
119     static bool ForceRescaleInterceptSlope;
120     static bool PMSRescaleInterceptSlope;
121     static bool ForcePixelSpacing;
122 };
123
124 } // end namespace gdcm
125
126 #endif // GDCMIMAGEHELPER_H

```

## 11.331 gdcmImageReader.h File Reference

```
#include "gdcmPixmapReader.h"
```

```
#include "gdcmImage.h"
```

Include dependency graph for gdcmImageReader.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::ImageReader](#)  
*ImageReader.*

## Namespaces

- namespace [gdcm](#)

## 11.332 gdcmImageReader.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGEREADER_H
15 #define GDCMIMAGEREADER_H
16
17 #include "gdcmPixmapReader.h"
18 #include "gdcmImage.h"
19
20 namespace gdcm
21 {
22
23 class MediaStorage;
24 class GDCM_EXPORT ImageReader : public PixmapReader
25 {
26 public:
27     ImageReader();
28     ~ImageReader() override; //needs to be virtual to ensure lack of memory leaks
29
30     bool Read() override;
31
32     // Following methods are valid only after a call to 'Read'
33
34     const Image& GetImage() const;
35     Image& GetImage();
36     //void SetImage(Image const &img);
37
38 protected:
39     bool ReadImage(MediaStorage const &ms) override;
40     bool ReadACRNEMAImage() override;
41 };
42
43 } // end namespace gdcm
44
45 #endif //GDCMIMAGEREADER_H

```

## 11.333 gdcmImageRegionReader.h File Reference

```

#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmRegion.h"

```

Include dependency graph for gdcmImageRegionReader.h:

## Classes

- class [gdcm::ImageRegionReader](#)  
*ImageRegionReader.*

## Namespaces

- namespace [gdcm](#)

## 11.334 gdcmImageRegionReader.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGEEXTENTREADER_H
15 #define GDCMIMAGEEXTENTREADER_H
16
17 #include "gdcmImageReader.h"
18 #include "gdcmImage.h"
19 #include "gdcmRegion.h"
20
21 namespace gdcm
22 {
23
24 class ImageRegionReaderInternals;
25 class GDCM_EXPORT ImageRegionReader : public ImageReader
26 {
27 public:
28     ImageRegionReader();
29     ~ImageRegionReader() override;
30
31     void SetRegion(const Region & region);
32     const Region &GetRegion() const;
33
34     size_t ComputeBufferLength() const;
35
36     bool ReadInformation();
37
38     bool ReadIntoBuffer(char *inreadbuffer, size_t buflen);
39
40 protected:
41     bool Read() override;
42
43 private:
44     BoxRegion ComputeBoundingBox();
45     bool ReadRAWIntoBuffer(char *buffer, size_t buflen);
46     bool ReadRLEIntoBuffer(char *buffer, size_t buflen);
47     bool ReadJPEG2000IntoBuffer(char *buffer, size_t buflen);
48     bool ReadJPEGIntoBuffer(char *buffer, size_t buflen);
49     bool ReadJPEGLSIntoBuffer(char *buffer, size_t buflen);
50     ImageRegionReaderInternals *Internals;
51 };
52
53 } // end namespace gdcm
54
55 #endif //GDCMIMAGEEXTENTREADER_H

```

## 11.335 gdcmImageToImageFilter.h File Reference

```
#include "gdcmPixmapToPixmapFilter.h"
```

Include dependency graph for gdcmImageToImageFilter.h: This graph shows which files directly or indirectly include this file:

### Classes

- class `gdcm::ImageToImageFilter`  
*ImageToImageFilter* class.

### Namespaces

- namespace `gdcm`

## 11.336 gdcmImageToImageFilter.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGETOIMAGEFILTER_H
15 #define GDCMIMAGETOIMAGEFILTER_H
16
17 #include "gdcmPixmapToPixmapFilter.h"
18
19 namespace gdcm
20 {
21
22 class Image;
23 class GDCM_EXPORT ImageToImageFilter : public PixmapToPixmapFilter
24 {
25 public:
26     ImageToImageFilter();
27     ~ImageToImageFilter() = default;
28
29     Image &GetInput();
30
31     // NOTE: covariant return-type to preserve backward compatible API
32     const Image &GetOutput() const;
33
34 protected:
35 };
36
37 } // end namespace gdcm
38
39 #endif //GDCMIMAGETOIMAGEFILTER_H
```



## 11.337 gdcmImageWriter.h File Reference

```
#include "gdcmPixmapWriter.h"
#include "gdcmImage.h"
Include dependency graph for gdcmImageWriter.h:
```

### Classes

- class [gdcm::ImageWriter](#)  
*ImageWriter.*

### Namespaces

- namespace [gdcm](#)

## 11.338 gdcmImageWriter.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMAGEWRITER_H
15 #define GDCMIMAGEWRITER_H
16
17 #include "gdcmPixmapWriter.h"
18 #include "gdcmImage.h"
19
20 namespace gdcm
21 {
22
23 class Image;
24 class GDCM_EXPORT ImageWriter : public PixmapWriter
25 {
26 public:
27     ImageWriter();
28     ~ImageWriter() override;
29
30     const Image& GetImage()const override { return dynamic_cast<const Image*>(*PixelData); }
31     Image& GetImage()override { return dynamic_cast<Image*>(*PixelData); } // FIXME
32     //void SetImage(Image const &img);
33
34     bool Write() override; // Execute()
35
36     MediaStorage ComputeTargetMediaStorage();
37 protected:
38
39 private:
40 };
41
42 } // end namespace gdcm
43
44 #endif //GDCMIMAGEWRITER_H
```

## 11.339 gdcmIPPSorter.h File Reference

```
#include "gdcmSorter.h"
```

```
#include <vector>
```

```
#include <string>
```

Include dependency graph for gdcmIPPSorter.h:

### Classes

- class [gdcm::IPPSorter](#)  
*IPPSorter.*

### Namespaces

- namespace [gdcm](#)

## 11.340 gdcmIPPSorter.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
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8
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIPPSORTER_H
15 #define GDCMIPPSORTER_H
16
17 #include "gdcmSorter.h"
18
19 #include <vector>
20 #include <string>
21
22 namespace gdcm
23 {
24     class GDCM_EXPORT IPPSorter : public Sorter
25     {
26     public:
27         IPPSorter();
28
29         // FIXME: I do not like public virtual function...
30         bool Sort(std::vector<std::string> const & filenames) override;
31
32         void SetComputeZSpacing(bool b) { ComputeZSpacing = b; }
33         void SetZSpacingTolerance(double tol) { ZTolerance = tol; }
34         double GetZSpacingTolerance()const { return ZTolerance; }
35
36         void SetDirectionCosinesTolerance(double tol) { DirCosTolerance = tol; }
37         double GetDirectionCosinesTolerance()const { return DirCosTolerance; }
38
39         void SetDropDuplicatePositions(bool b) { DropDuplicatePositions = b; }
40
41         double GetZSpacing()const { return ZSpacing; }
42     protected:
```

```

97  bool ComputeZSpacing;
98  bool DropDuplicatePositions;
99  double ZSpacing;
100 double ZTolerance;
101 double DirCosTolerance;
102
103 private:
104     GDCM_LEGACY(bool ComputeSpacing(std::vector<std::string> const & filenames))
105 };
106
107
108 } // end namespace gdcm
109
110 #endif //GDCMIPPSORTER_H

```

## 11.341 gdcmJPEG12Codec.h File Reference

```
#include "gdcmJPEGCodec.h"
```

Include dependency graph for gdcmJPEG12Codec.h:

### Classes

- class [gdcm::JPEG12Codec](#)  
*Class to do JPEG 12bits (lossy & lossless)*

### Namespaces

- namespace [gdcm](#)

## 11.342 gdcmJPEG12Codec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJPEG12CODEC_H
15 #define GDCMJPEG12CODEC_H
16
17 #include "gdcmJPEGCodec.h"
18
19 namespace gdcm
20 {
21
22 class JPEGInternals_12BIT;
23 class ByteValue;
24 class JPEG12Codec : public JPEGCodec
25 {
26 public:
27     JPEG12Codec();

```

```

32  ~JPEG12Codec() override;
33
34  bool DecodeByStreams(std::istream &is, std::ostream &os) override;
35  bool InternalCode(const char *input, unsigned long len, std::ostream &os) override;
36
37  bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
38
39 protected:
40  bool IsStateSuspension() const override;
41  bool EncodeBuffer(std::ostream &os, const char *data, size_t datalen) override;
42
43 private:
44  JPEGInternals_12BIT *Internals;
45 };
46
47 } // end namespace gdcmm
48
49 #endif //GDCMJPEG12CODEC_H

```

## 11.343 gdcmmJPEG16Codec.h File Reference

```
#include "gdcmmJPEGCodec.h"
```

Include dependency graph for gdcmmJPEG16Codec.h:

### Classes

- class [gdcmm::JPEG16Codec](#)  
*Class to do JPEG 16bits (lossless)*

### Namespaces

- namespace [gdcmm](#)

## 11.344 gdcmmJPEG16Codec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJPEG16CODEC_H
15 #define GDCMJPEG16CODEC_H
16
17 #include "gdcmmJPEGCodec.h"
18
19 namespace gdcmm
20 {
21
22 class JPEGInternals_16BIT;
23 class ByteValue;

```

```

28 class JPEG16Codec : public JPEGCodec
29 {
30 public:
31     JPEG16Codec();
32     ~JPEG16Codec() override;
33
34     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
35     bool InternalCode(const char *input, unsigned long len, std::ostream &os) override;
36
37     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
38
39 protected:
40     bool IsStateSuspension() const override;
41     bool EncodeBuffer(std::ostream &os, const char *data, size_t datalen) override;
42
43 private:
44     JPEGInternals_16BIT *Internals;
45 };
46
47 } // end namespace gdcm
48
49 #endif //GDCMJPEG16CODEC_H

```

## 11.345 gdcmJPEG2000Codec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmJPEG2000Codec.h:

### Classes

- class [gdcm::JPEG2000Codec](#)  
*Class to do JPEG 2000.*

### Namespaces

- namespace [gdcm](#)

## 11.346 gdcmJPEG2000Codec.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJPEG2000CODEC_H
15 #define GDCMJPEG2000CODEC_H
16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm

```

```

20 {
21
22 class JPEG2000Internals;
23 class GDCM_EXPORT JPEG2000Codec : public ImageCodec
24 {
25     friend class ImageRegionReader;
26     friend class Bitmap;
27 public:
28     JPEG2000Codec();
29     ~JPEG2000Codec() override;
30
31     bool CanDecode(TransferSyntax const &ts) const override;
32     bool CanCode(TransferSyntax const &ts) const override;
33
34     bool Decode(DataElement const &is, DataElement &os) override;
35     bool Code(DataElement const &in, DataElement &out) override;
36
37     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
38     ImageCodec * Clone() const override;
39
40     // JPEG-2000 / OpenJPEG specific way of encoding lossy-ness
41     // ref: http://www.openjpeg.org/index.php?menu=doc#encoder
42     void SetRate(unsigned int idx, double rate);
43     double GetRate(unsigned int idx = 0) const;
44
45     void SetQuality(unsigned int idx, double q);
46     double GetQuality(unsigned int idx = 0) const;
47
48     void SetTileSize(unsigned int tx, unsigned int ty);
49
50     void SetNumberOfResolutions(unsigned int nres);
51
52     void SetNumberOfThreadsForDecompression(int nThreads);
53
54     void SetReversible(bool res);
55     void SetMCT(unsigned int mct);
56
57 protected:
58     bool DecodeExtent(
59         char *buffer,
60         unsigned int xmin, unsigned int xmax,
61         unsigned int ymin, unsigned int ymax,
62         unsigned int zmin, unsigned int zmax,
63         std::istream & is
64     );
65
66     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
67
68     bool StartEncode( std::ostream & ) override;
69     bool IsRowEncoder() override;
70     bool IsFrameEncoder() override;
71     bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
72     bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
73     bool StopEncode( std::ostream & ) override;
74
75 private:
76     std::pair<char *, size_t> DecodeByStreamsCommon(char *dummy_buffer, size_t buf_size);
77     bool CodeFrameIntoBuffer(char * outdata, size_t outlen, size_t & complen, const char * indata, size_t inlen
78     );
79     bool GetHeaderInfo(const char * dummy_buffer, size_t len, TransferSyntax &ts);
80     JPEG2000Internals *Internals;
81 };
82
83 // end namespace gdcm
84
85 #endif //GDCMJPEG2000CODEC_H

```

## 11.347 gdcmJPEG8Codec.h File Reference

#include "gdcmJPEGCodec.h"

Include dependency graph for gdcmJPEG8Codec.h:

## Classes

- class [gdcm::JPEG8Codec](#)  
*Class to do JPEG 8bits (lossy & lossless)*

## Namespaces

- namespace [gdcm](#)

## 11.348 gdcmJPEG8Codec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJPEG8CODEC_H
15 #define GDCMJPEG8CODEC_H
16
17 #include "gdcmJPEGCodec.h"
18
19 namespace gdcm
20 {
21
22 class JPEGInternals_8BIT;
23 class ByteValue;
24
25 class JPEG8Codec : public JPEGCodec
26 {
27 public:
28     JPEG8Codec();
29     ~JPEG8Codec() override;
30
31     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
32     bool InternalCode(const char *input, unsigned long len, std::ostream &os) override;
33
34     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
35
36 protected:
37     bool IsStateSuspension() const override;
38     bool EncodeBuffer(std::ostream &os, const char *data, size_t datalen) override;
39
40 private:
41     JPEGInternals_8BIT *Internals;
42 };
43
44 } // end namespace gdcm
45
46 #endif //GDCMJPEG8CODEC_H

```

## 11.349 gdcmJPEGCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmJPEGCodec.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::JPEGCodec](#)  
*JPEG codec.*

## Namespaces

- namespace [gdcm](#)

## 11.350 gdcmJPEGCodec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJPEGCODEC_H
15 #define GDCMJPEGCODEC_H
16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22 class PixelFormat;
23 class TransferSyntax;
24 class GDCM_EXPORT JPEGCodec : public ImageCodec
25 {
26 public:
27     JPEGCodec();
28     ~JPEGCodec() override;
29     bool CanDecode(TransferSyntax const &ts) const override;
30     bool CanCode(TransferSyntax const &ts) const override;
31     bool Decode(DataElement const &is, DataElement &os) override;
32     void SetPixelFormat(PixelFormat const &pf) override;
33
34     void ComputeOffsetTable(bool b);
35
36     bool Code(DataElement const &in, DataElement &out) override;
37
38     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
39     ImageCodec * Clone() const override;
40
41     //void SetReversible(bool res);
42
43     void SetQuality(double q);
44     double GetQuality() const;
45
46     void SetLossless(bool l);
47     bool GetLossless() const;
48
49     virtual bool EncodeBuffer(std::ostream &out,
50                               const char *inbuffer, size_t inlen);
51
52 protected:
53     bool DecodeExtent(
54         char *buffer,
55         unsigned int xmin, unsigned int xmax,
56         unsigned int ymin, unsigned int ymax,

```



```

76     unsigned int zmin, unsigned int zmax,
77     std::istream & is
78 );
79
80 bool DecodeByStreams(std::istream &is, std::ostream &os) override;
81 bool IsValid(PhotometricInterpretation const &pi) override;
82
83 bool StartEncode( std::ostream & ) override;
84 bool IsRowEncoder() override;
85 bool IsFrameEncoder() override;
86 bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
87 bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
88 bool StopEncode( std::ostream & ) override;
89
90 protected:
91     // Internal method called by SetPixelFormat
92     // Instantiate the right jpeg codec (8, 12 or 16)
93     void SetBitSample(int bit);
94
95     virtual bool IsStateSuspension() const;
96
97 protected:
98     int BitSample;
99     //bool Lossless;
100    int Quality;
101
102 private:
103     void SetupJPEGBitCodec(int bit);
104     JPEGCodec *Internal;
105 };
106
107 } // end namespace gdcm
108
109 #endif //GDCMJPEGCODEC_H

```

## 11.351 gdcmJPEGLSCodec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmJPEGLSCodec.h:

### Classes

- class [gdcm::JPEGLSCodec](#)  
*JPEG-LS.*

### Namespaces

- namespace [gdcm](#)

## 11.352 gdcmJPEGLSCodec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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```

```

8
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJPEGLSCODEC_H
15 #define GDCMJPEGLSCODEC_H
16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22 class JPEGLSInternals;
23 class GDCM_EXPORT JPEGLSCodec : public ImageCodec
24 {
25     friend class ImageRegionReader;
26 public:
27     JPEGLSCodec();
28     ~JPEGLSCodec() override;
29     bool CanDecode(TransferSyntax const &ts) const override;
30     bool CanCode(TransferSyntax const &ts) const override;
31
32     unsigned long GetBufferLength()const { return BufferLength; }
33     void SetBufferLength(unsigned long l) { BufferLength = l; }
34
35     bool Decode(DataElement const &is, DataElement &os) override;
36     bool Decode(DataElement const &in, char* outBuffer, size_t inBufferLength,
37                 uint32_t inXMin, uint32_t inXMax, uint32_t inYMin,
38                 uint32_t inYMax, uint32_t inZMin, uint32_t inZMax);
39     bool Code(DataElement const &in, DataElement &out) override;
40
41     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
42     ImageCodec * Clone() const override;
43
44     void SetLossless(bool l);
45     bool GetLossless() const;
46
47     /*
48     * test.acr can look pretty bad, even with a lossy error of 2. Explanation follows:
49     * I agree that the test image looks ugly. In this particular case I can
50     * explain though.
51     *
52     * The image is 8 bit, but it does not use the full 8 bit dynamic range. The
53     * black pixels have value 234 and the white 255. If you set allowed lossy
54     * error to 2, you allow an error of about 10% of the actual dynamic range.
55     * That is of course very visible.
56     */
57     void SetLossyError(int error);
58
59 protected:
60     bool DecodeExtent(
61         char *buffer,
62         unsigned int xmin, unsigned int xmax,
63         unsigned int ymin, unsigned int ymax,
64         unsigned int zmin, unsigned int zmax,
65         std::istream & is
66     );
67
68     bool StartEncode( std::ostream & ) override;
69     bool IsRowEncoder() override;
70     bool IsFrameEncoder() override;
71     bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
72     bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
73     bool StopEncode( std::ostream & ) override;
74
75 private:
76     bool DecodeByStreamsCommon(const char *buffer, size_t totalLen, std::vector<unsigned char> &rgbyteOut);
77     bool CodeFrameIntoBuffer(char * outdata, size_t outlen, size_t &complen, const char * indata, size_t inlen
78     );
79
80     unsigned long BufferLength;
81     int LossyError;
82 };
83
84 } // end namespace gdcm
85
86 #endif //GDCMJPEGLSCODEC_H

```

## 11.353 gdcmJSON.h File Reference

```
#include "gdcmFile.h"
#include "gdcmDataElement.h"
Include dependency graph for gdcmJSON.h:
```

### Classes

- class [gdcm::JSON](#)

### Namespaces

- namespace [gdcm](#)

## 11.354 gdcmJSON.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMJSON_H
15 #define GDCMJSON_H
16
17 /*
18 See Sup 166 (QIDO-RS)
19 http://www.dclunie.com/dicom-status/status.html#Supplement166
20 */
21
22 #include "gdcmFile.h"
23 #include "gdcmDataElement.h"
24
25 namespace gdcm
26 {
27
28 class JSONInternal;
29 class GDCM_EXPORT JSON
30 {
31 public:
32     JSON();
33     ~JSON();
34
35     bool GetPrettyPrint() const;
36     void SetPrettyPrint(bool onoff);
37     void PrettyPrintOn();
38     void PrettyPrintOff();
39
40     bool Code(DataSet const & in, std::ostream & os);
41     bool Decode(std::istream & is, DataSet & out);
42
43 private:
44     JSONInternal *Internals;
45 };
46
47 } // end namespace gdcm
48
49 #endif //GDCMXMLPRINTER_H
```

## 11.355 gdcmKAKADUCodec.h File Reference

```
#include "gdcmImageCodec.h"
```

Include dependency graph for gdcmKAKADUCodec.h:

### Classes

- class [gdcm::KAKADUCodec](#)  
*KAKADUCodec.*

### Namespaces

- namespace [gdcm](#)

## 11.356 gdcmKAKADUCodec.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMKAKADUCODEC_H
15 #define GDCMKAKADUCODEC_H
16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22     class KAKADUCodec : public ImageCodec
23     {
24     public:
25         KAKADUCodec();
26         ~KAKADUCodec() override;
27         bool CanDecode(TransferSyntax const &ts) const override;
28         bool CanCode(TransferSyntax const &ts) const override;
29
30         bool Decode(DataElement const &is, DataElement &os) override;
31         bool Code(DataElement const &in, DataElement &out) override;
32
33         ImageCodec * Clone() const override;
34     private:
35     };
36
37 } // end namespace gdcm
38
39 #endif //GDCMKAKADUCODEC_H
```

## 11.357 gdcmLookupTable.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmObject.h"
#include <stdlib.h>
```

Include dependency graph for gdcmLookupTable.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::LookupTable](#)  
*LookupTable* class.

### Namespaces

- namespace [gdcm](#)

## 11.358 gdcmLookupTable.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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4
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMLOOKUPTABLE_H
16 #define GDCMLOOKUPTABLE_H
17
18 #include "gdcmTypes.h"
19 #include "gdcmObject.h"
20 #include <stdlib.h>
21
22 namespace gdcm
23 {
24
25 class LookupTableInternal;
26 class GDCM_EXPORT LookupTable : public Object
27 {
28 public:
29     typedef enum {
30         RED = 0,    // Keep RED == 0
31         GREEN,
32         BLUE,
33         GRAY,
34         UNKNOWN
35     } LookupTableType;
36
37     LookupTable();
38     ~LookupTable() override;
39     void Print(std::ostream &) const override;
40
41     void Allocate( unsigned short bitsample = 8 );
42     //TODO: check to see if length should be unsigned short, unsigned int, or whatever
43     void InitializeLUT(LookupTableType type, unsigned short length,
```

```

49     unsigned short subscript, unsigned short bitsize);
50     unsigned int GetLUTLength(LookupTableType type) const;
51     virtual void SetLUT(LookupTableType type, const unsigned char *array,
52         unsigned int length);
53     void GetLUT(LookupTableType type, unsigned char *array, unsigned int &length) const;
54     void GetLUTDescriptor(LookupTableType type, unsigned short &length,
55         unsigned short &subscript, unsigned short &bitsize) const;
56
57     void InitializeRedLUT(unsigned short length, unsigned short subscript,
58         unsigned short bitsize);
59     void SetRedLUT(const unsigned char *red, unsigned int length);
60     void InitializeGreenLUT(unsigned short length, unsigned short subscript,
61         unsigned short bitsize);
62     void SetGreenLUT(const unsigned char *green, unsigned int length);
63     void InitializeBlueLUT(unsigned short length, unsigned short subscript,
64         unsigned short bitsize);
65     void SetBlueLUT(const unsigned char *blue, unsigned int length);
66
67     void Clear();
68
69     void Decode(std::istream &is, std::ostream &os) const;
70
71     bool Decode(char *outputbuffer, size_t outlen, const char *inputbuffer, size_t inlen) const;
72
73     bool IsRGB8() const;
74
75     bool Decode8(char *outputbuffer, size_t outlen, const char *inputbuffer, size_t inlen) const;
76
77     LookupTable(LookupTable const &lut):Object(lut)
78     {
79         assert(0);
80     }
81
82     bool GetBufferAsRGBA(unsigned char *rgba) const;
83
84     const unsigned char *GetPointer() const;
85
86     bool WriteBufferAsRGBA(const unsigned char *rgba);
87
88     unsigned short GetBitSample()const { return BitSample; }
89
90     bool Initialized() const;
91
92 private:
93     void Encode(std::istream &is, std::ostream &os);
94
95 protected:
96     LookupTableInternal *Internal;
97     unsigned short BitSample; // refer to the pixel type (not the bit size of LUT)
98     bool IncompleteLUT:1;
99 };
100
101 } // end namespace gdcmm
102
103 #endif //GDCMLOOKUPTABLE_H

```

## 11.359 gdcmmEC\_MR3.h File Reference

#include "gdcmmPrivateTag.h"

Include dependency graph for gdcmmEC\_MR3.h:

### Classes

- class [gdcmm::MEC\\_MR3](#)  
Class for [MEC\\_MR3](#).

### Namespaces

- namespace [gdcmm](#)

## 11.360 gdcmMEC\_MR3.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMEC_MR3_H
15 #define GDCMMEC_MR3_H
16
17 #include "gdcmPrivateTag.h"
18
19 namespace gdcm {
20   class GDCM_EXPORT MEC_MR3 {
21   public:
22     static bool Print(const char *src, size_t srclen);
23
24     static const PrivateTag &GetPMTFInformationDataTag();
25
26     static const PrivateTag &GetCanonMECMR3Tag();
27
28     static const PrivateTag &GetToshibaMECMR3Tag();
29   };
30 } // end namespace gdcm
31
32 #endif // GDCMMEC_MR3_H

```

## 11.361 gdcmMeshPrimitive.h File Reference

```

#include <gdcmObject.h>
#include <gdcmDataElement.h>

```

Include dependency graph for gdcmMeshPrimitive.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::MeshPrimitive](#)  
*This class defines surface mesh primitives.*

### Namespaces

- namespace [gdcm](#)

## 11.362 gdcmMeshPrimitive.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMMESHPRIMITIVE_H
16 #define GDCMMESHPRIMITIVE_H
17
18 #include <gdcmObject.h>
19 #include <gdcmDataElement.h>
20
21 namespace gdcm
22 {
23
24     class GDCM_EXPORT MeshPrimitive : public Object
25     {
26     public:
27
28         typedef std::vector< DataElement > PrimitivesData;
29
30         typedef enum {
31             VERTEX = 0,
32             EDGE,
33             TRIANGLE,
34             TRIANGLE_STRIP,
35             TRIANGLE_FAN,
36             LINE,
37             FACET,
38             MPType_END
39         } MPType;
40
41         static const char * GetMPTypeString(const MPType type);
42
43         static MPType GetMPType(const char * type);
44
45         MeshPrimitive();
46
47         ~MeshPrimitive() override;
48
49         MPType GetPrimitiveType() const;
50         void SetPrimitiveType(const MPType type);
51
52         const DataElement & GetPrimitiveData() const;
53         DataElement & GetPrimitiveData();
54         void SetPrimitiveData(DataElement const & de);
55
56         const PrimitivesData & GetPrimitivesData() const;
57         PrimitivesData & GetPrimitivesData();
58         void SetPrimitivesData(PrimitivesData const & DEs);
59
60         const DataElement & GetPrimitiveData(const unsigned int idx) const;
61         DataElement & GetPrimitiveData(const unsigned int idx);
62         void SetPrimitiveData(const unsigned int idx, DataElement const & de);
63         void AddPrimitiveData(DataElement const & de);
64
65         unsigned int GetNumberOfPrimitivesData() const;
66
67     protected:
68
69         // Use to define tag where PrimitiveData will be put.
70         MPType PrimitiveType;
71
72         // PrimitiveData contains point index list.
73         // It shall have 1 or 1-n DataElement following PrimitiveType.
74         PrimitivesData PrimitiveData;
75     };
76
77
78
79
80
81
82
83
84
85
86 };
87

```



```

88 }
89
90 #endif // GDCMMESHPRIMITIVE_H

```

## 11.363 gdcmOrientation.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmOrientation.h:

### Classes

- class [gdcm::Orientation](#)  
class to handle *Orientation*

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const Orientation &o)

## 11.364 gdcmOrientation.h

[Go to the documentation of this file.](#)

```

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12
13 =====*/
14 #ifndef GDCMORIENTATION_H
15 #define GDCMORIENTATION_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT Orientation
23     {
24     public:
25         friend std::ostream& operator<<(std::ostream &os, const Orientation &o);
26         Orientation();
27         ~Orientation();
28         void Print(std::ostream &) const;
29     };
30
31
32
33
34

```

```

35  typedef enum {
36      UNKNOWN,
37      AXIAL,
38      CORONAL,
39      SAGITTAL,
40      OBLIQUE
41  } OrientationType;
42
43  static OrientationType GetType(const double dircos[6]);
44
45  static void SetObliquityThresholdCosineValue(double val);
46  static double GetObliquityThresholdCosineValue();
47
48  static const char *GetLabel(OrientationType type);
49
50  protected:
51  static char GetMajorAxisFromPatientRelativeDirectionCosine(double x, double y, double z);
52
53  private:
54  static double ObliquityThresholdCosineValue;
55  };
56
57  //-----
58  inline std::ostream& operator<<(std::ostream &os, const Orientation &o)
59  {
60      o.Print( os );
61      return os;
62  }
63
64  } // end namespace gdcm
65
66  #endif //GDCMORIENTATION_H

```

## 11.365 gdcmOverlay.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmObject.h"

```

Include dependency graph for gdcmOverlay.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Overlay](#)  
*Overlay class.*

### Namespaces

- namespace [gdcm](#)

## 11.366 gdcmOverlay.h

[Go to the documentation of this file.](#)

```

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```

```

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12
13 =====*/
14 #ifndef GDCMOVERLAY_H
15 #define GDCMOVERLAY_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmObject.h"
19
20 namespace gdcm
21 {
22
23 class OverlayInternal;
24 class ByteValue;
25 class DataSet;
26 class DataElement;
27
28 class GDCM_EXPORT Overlay : public Object
29 {
30 public:
31     Overlay();
32     ~Overlay() override;
33     void Print(std::ostream &) const override;
34
35     void Update(const DataElement & de);
36
37     void SetGroup(unsigned short group);
38     unsigned short GetGroup() const;
39     void SetRows(unsigned short rows);
40     unsigned short GetRows() const;
41     void SetColumns(unsigned short columns);
42     unsigned short GetColumns() const;
43     void SetNumberOfFrames(unsigned int numberofframes);
44     void SetDescription(const char* description);
45     const char *GetDescription() const;
46     typedef enum {
47         Invalid = 0,
48         Graphics = 1,
49         ROI = 2
50     } OverlayType;
51     void SetType(const char* type);
52     const char *GetType() const;
53     OverlayType GetTypeAsEnum() const;
54     static const char *GetOverlayTypeAsString(OverlayType ot);
55     static OverlayType GetOverlayTypeFromString(const char *);
56     void SetOrigin(const signed short origin[2]);
57     const signed short * GetOrigin() const;
58     void SetFrameOrigin(unsigned short frameorigin);
59     void SetBitsAllocated(unsigned short bitsallocated);
60     unsigned short GetBitsAllocated() const;
61     void SetBitPosition(unsigned short bitposition);
62     unsigned short GetBitPosition() const;
63
64     void SetOverlay(const char *array, size_t length);
65     bool GrabOverlayFromPixelData(DataSet const &ds);
66
67     const ByteValue &GetOverlayData() const;
68
69     bool IsEmpty() const;
70
71     bool IsZero() const;
72
73     bool IsInPixelData() const;
74
75     void IsInPixelData(bool b);
76
77     void Decompress(std::ostream &os) const;
78
79     size_t GetUnpackBufferLength() const;
80
81     bool GetUnpackBuffer(char *buffer, size_t len) const;
82
83     Overlay(Overlay const &ov);
84     Overlay &operator=(Overlay const &ov);
85
86 private:
87     OverlayInternal *Internal;
88 };
89
90 } // end namespace gdcm
91
92

```

```
135 #endif //GDCMOVERLAY_H
```

## 11.367 gdcmPDFCodec.h File Reference

```
#include "gdcmCodec.h"
```

Include dependency graph for gdcmPDFCodec.h:

### Classes

- class [gdcm::PDFCodec](#)  
*PDFCodec class.*

### Namespaces

- namespace [gdcm](#)

## 11.368 gdcmPDFCodec.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPDFCODEC_H
15 #define GDCMPDFCODEC_H
16
17 #include "gdcmCodec.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT PDFCodec : public Codec
23     {
24     public:
25         PDFCodec();
26         ~PDFCodec() override;
27         bool CanCode(TransferSyntax const &)const override { return false; }
28         bool CanDecode(TransferSyntax const &)const override { return false; }
29         bool Decode(DataElement const &is, DataElement &os) override;
30     };
31
32 } // end namespace gdcm
33
34 #endif //GDCMPDFCODEC_H
```

## 11.369 gdcmPersonName.h File Reference

```
#include "gdcmTypes.h"
#include <vector>
#include <algorithm>
#include <string.h>
Include dependency graph for gdcmPersonName.h:
```

### Classes

- class [gdcm::PersonName](#)  
*PersonName* class.

### Namespaces

- namespace [gdcm](#)

## 11.370 gdcmPersonName.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMPERSONNAME_H
16 #define GDCMPERSONNAME_H
17
18 #include "gdcmTypes.h"
19 #include <vector>
20 #include <algorithm> // std::min
21 #include <string.h> // strlen
22
23 namespace gdcm
24 {
25
26 class GDCM_EXPORT PersonName
27 {
28 public:
29     static const unsigned int MaxNumberOfComponents = 5;
30     static const unsigned int MaxLength = 64;
31     char Component[MaxNumberOfComponents][MaxLength+1];
32     static const char Separator = '^';
33     static const char Padding = ' ';
34
35     unsigned int GetNumberOfComponents() const {
36         unsigned int r = 0;
37         for(unsigned int i = 0; i < 5; ++i) {
38             if( *Component[i] != '\0' ) r = i;
39         }
40         return r+1;
41     }
42
43     unsigned int GetMaxLength() const { return MaxLength; };
44 }
```

```

46 void SetBlob(const std::vector<char>& v) {
47     (void)v;
48     //assert(0); //TODO
49 }
50 void SetComponents(const char *comp1 = "",
51     const char *comp2 = "",
52     const char *comp3 = "",
53     const char *comp4 = "",
54     const char *comp5 = "") {
55     const char *components[5] = { comp1, comp2, comp3, comp4, comp5 };
56     SetComponents( components );
57 }
58 void SetComponents(const char *components[]) {
59     if( components )
60         for(unsigned int i = 0; i < 5; ++i) {
61             if( components[i] && strlen(components[i]) < GetMaxLength() )
62                 strcpy(Component[i], components[i]);
63             assert( strlen(Component[i]) < GetMaxLength() );
64         }
65 }
66 void Print(std::ostream &os) const
67 {
68     //os << "Family Name Complex: " << Component[0] << std::endl;
69     //os << "Given Name Complex: " << Component[1] << std::endl;
70     //os << "Middle Name      : " << Component[2] << std::endl;
71     //os << "Name Suffix       : " << Component[3] << std::endl;
72     //os << "Name Prefix      : " << Component[4] << std::endl;
73     os << Component[0] << '\n';
74     os << Component[1] << '\n';
75     os << Component[2] << '\n';
76     os << Component[3] << '\n';
77     os << Component[4];
78 }
79 };
80
81 } // end namespace gdcm
82
83 #endif //GDCMPERSONNAME_H

```

## 11.371 gdcmPGXCodec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmPGXCodec.h:

### Classes

- class [gdcm::PGXCodec](#)  
Class to do PGX.

### Namespaces

- namespace [gdcm](#)

## 11.372 gdcmPGXCodec.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
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```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPGXCODEC_H
15 #define GDCMPGXCODEC_H
16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT PGXCodec : public ImageCodec
23 {
24 public:
25     PGXCodec();
26     ~PGXCodec() override;
27     bool CanDecode(TransferSyntax const &ts) const override;
28     bool CanCode(TransferSyntax const &ts) const override;
29
30     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
31     ImageCodec * Clone() const override;
32
33     bool Read(const char *filename, DataElement &out) const;
34     bool Write(const char *filename, const DataElement &out) const;
35 private:
36 };
37
38 } // end namespace gdcm
39
40 #endif //GDCMPGXCODEC_H

```

## 11.373 gdcmPhotometricInterpretation.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <iostream>
```

Include dependency graph for gdcmPhotometricInterpretation.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::PhotometricInterpretation](#)  
Class to represent an *PhotometricInterpretation*.

### Namespaces

- namespace [gdcm](#)

### Functions

- `std::ostream & gdcm::operator<< (std::ostream &os, const PhotometricInterpretation &val)`

## 11.374 gdcmPhotometricInterpretation.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMPHOTOMETRICINTERPRETATION_H
16 #define GDCMPHOTOMETRICINTERPRETATION_H
17
18 #include "gdcmTypes.h"
19 #include <iostream>
20
21 namespace gdcm
22 {
23
24 class TransferSyntax;
25
26 class GDCM_EXPORT PhotometricInterpretation
27 {
28 public:
29     typedef enum {
30         UNKNOWN = 0,
31         MONOCHROME1,
32         MONOCHROME2,
33         PALETTE_COLOR,
34         RGB,
35         HSV,
36         ARGB, // retired
37         CMYK,
38         YBR_FULL,
39         YBR_FULL_422,
40         YBR_PARTIAL_422,
41         YBR_PARTIAL_420,
42         YBR_ICT,
43         YBR_RCT,
44         // PALETTE_COLOR ?
45         // MONOCHROME = MONOCHROME1 | MONOCHROME2,
46         // COLOR = RGB | HSV | ARGB | CMYK | YBR_FULL | YBR_FULL_422 | YBR_PARTIAL_422 | YBR_PARTIAL_420 |
47         YBR_ICT | YBR_RCT,
48         PI_END // Helpful for internal implementation
49     } PType; // PhotometricInterpretationType
50
51     PhotometricInterpretation(PType pi = UNKNOWN):PIField(pi) {}
52
53     static const char *GetPIStr(PType pi);
54
55     const char *GetString() const;
56
57     // You need to make sure end of string is \0
58     static PType GetPType(const char *pi);
59
60     static bool IsRetired(PType pi);
61
62     bool IsLossy() const;
63     bool IsLossless() const;
64
65     unsigned short GetSamplesPerPixel() const;
66
67     // TODO
68     // not all PhotometricInterpretation are allowed for compressed Transfer
69     // syntax
70     // static bool IsAllowedForCompressedTS(PType pi);
71
72     friend std::ostream& operator<<(std::ostream& os, const PhotometricInterpretation& pi);
73
74     operator PType ()const { return PIField; }
75
76     PType GetType ()const { return PIField; }
77
78
79

```



```

80 // Will return whether current PhotometricInterpretation is the same Color Space as input:
81 // eg. RGB and YBR_RCT are
82 bool IsSameColorSpace( PhotometricInterpretation const &pi ) const;
83
84 //static PType GetEquivalent(TransferSyntax const &ts);
85
86 private:
87     PType PIField;
88 };
89 //-----
90 inline std::ostream& operator<<(std::ostream& os, const PhotometricInterpretation &val)
91 {
92     const char *s = PhotometricInterpretation::GetPIString(val.PIField);
93     os << (s ? s : "");
94     return os;
95 }
96
97
98 } // end namespace gdcm
99
100 #endif //GDCMPHOTOMETRICINTERPRETATION_H

```

## 11.375 gdcmPixelFormat.h File Reference

```

#include "gdcmTypes.h"
#include <iostream>
#include <assert.h>

```

Include dependency graph for gdcmPixelFormat.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::PixelFormat](#)  
*PixelFormat.*

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const PixelFormat &pf)

## 11.376 gdcmPixelFormat.h

[Go to the documentation of this file.](#)

```

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```

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12
13 =====*/
14
15 #ifndef GDCMPIXELFORMAT_H
16 #define GDCMPIXELFORMAT_H
17
18 #include "gdcmTypes.h"
19 #include <iostream>
20 #include <assert.h>
21
22 namespace gdcm
23 {
24
25 class TransferSyntax;
26
27 class GDCM_EXPORT PixelFormat
28 {
29     friend class Bitmap;
30     friend std::ostream& operator<<(std::ostream &_os, const PixelFormat &pf);
31 public:
32     // When adding a type please add its dual type (its unsigned counterpart)
33     typedef enum {
34         UINT8,
35         INT8,
36         UINT12,
37         INT12,
38         UINT16,
39         INT16,
40         UINT32, // For some DICOM files (RT or SC)
41         INT32,  // " "
42         UINT64, // Needed when input is 32bits + intercept/slope (incomplete support)
43         INT64,  // " "
44         FLOAT16, // sure why not...
45         FLOAT32, // good ol' 'float'
46         FLOAT64, // aka 'double'
47         SINGLEBIT, // bool / monochrome
48         UNKNOWN // aka BitsAllocated == 0 && PixelRepresentation == 0
49     } ScalarType;
50
51     // default ctor:
52     PixelFormat () : PixelFormat(1, 8, 8, 7, 0) {}
53
54     explicit PixelFormat (
55         unsigned short samplesperpixel,
56         unsigned short bitsallocated = 8,
57         unsigned short bitsstored = 8,
58         unsigned short highbit = 7,
59         unsigned short pixelrepresentation = 0 ) :
60         SamplesPerPixel(samplesperpixel),
61         BitsAllocated(bitsallocated),
62         BitsStored(bitsstored),
63         HighBit(highbit),
64         PixelRepresentation(pixelrepresentation) {}
65     // helper, for the common case
66     PixelFormat(ScalarType st);
67
68     // For transparency of use
69     operator ScalarType()const { return GetScalarType(); }
70
71     unsigned short GetSamplesPerPixel() const;
72     void SetSamplesPerPixel(unsigned short spp)
73     {
74         gdcmAssertMacro( spp <= 4 );
75         SamplesPerPixel = spp;
76         assert( SamplesPerPixel == 1 || SamplesPerPixel == 3 || SamplesPerPixel == 4 );
77     }
78
79     unsigned short GetBitsAllocated()const
80     {
81         return BitsAllocated;
82     }
83     void SetBitsAllocated(unsigned short ba)
84     {
85         if( ba )
86         {
87             switch( ba )
88             {
89                 /* some devices (FUJIFILM CR + MONO1) incorrectly set BitsAllocated/BitsStored
90                  * as bitmask instead of value. Do what they mean instead of what they say.

```

```

112 */
113     case 0xffff: ba = 16; break;
114     case 0x0fff: ba = 12; break;
115     case 0x00ff: ba = 8; break;
116 }
117 BitsAllocated = ba;
118 BitsStored = ba;
119 HighBit = (unsigned short)(ba - 1);
120 }
121 else // Make the PixelFormat as UNKNOWN
122 {
123     BitsAllocated = 0;
124     PixelRepresentation = 0;
125 }
126 }
127
128 unsigned short GetBitsStored() const
129 {
130     assert( BitsStored <= BitsAllocated );
131     return BitsStored;
132 }
133
134 void SetBitsStored(unsigned short bs)
135 {
136     switch( bs )
137     {
138         /* see SetBitsAllocated for explanation
139 */
140         case 0xffff: bs = 16; break;
141         case 0x0fff: bs = 12; break;
142         case 0x00ff: bs = 8; break;
143     }
144     if( bs <= BitsAllocated && bs )
145     {
146         BitsStored = bs;
147         SetHighBit( (unsigned short) (bs - 1) );
148     }
149 }
150
151 unsigned short GetHighBit() const
152 {
153     assert( HighBit < BitsStored );
154     return HighBit;
155 }
156
157 void SetHighBit(unsigned short hb)
158 {
159     switch( hb )
160     {
161         /* broken implementations that use bitmask for BitsAllocated/Stored
162 * nonetheless use (BitsStored-1) for HighBit. correct for this here.
163 */
164         case 0xffff: hb = 15; break;
165         case 0x0ffe: hb = 11; break;
166         case 0x00fe: hb = 7; break;
167     }
168     if( hb < BitsStored )
169         HighBit = hb;
170 }
171
172 unsigned short GetPixelRepresentation() const
173 {
174     return (unsigned short)(PixelRepresentation ? 1 : 0);
175 }
176
177 void SetPixelRepresentation(unsigned short pr)
178 {
179     PixelRepresentation = (unsigned short)(pr ? 1 : 0);
180 }
181
182 ScalarType GetScalarType() const;
183
184 void SetScalarType(ScalarType st);
185 const char *GetScalarTypeAsString() const;
186
187 uint8_t GetPixelSize() const;
188
189 void Print(std::ostream &os) const;
190
191 int64_t GetMin() const;
192
193 int64_t GetMax() const;
194
195 bool IsValid() const;

```

```

208
209 bool operator==(ScalarType st) const
210 {
211     return GetScalarType() == st;
212 }
213 bool operator!=(ScalarType st) const
214 {
215     return GetScalarType() != st;
216 }
217 bool operator==(const PixelFormat &pf) const
218 {
219     return
220         SamplesPerPixel == pf.SamplesPerPixel &&
221         BitsAllocated == pf.BitsAllocated &&
222         BitsStored == pf.BitsStored &&
223         HighBit == pf.HighBit &&
224         PixelRepresentation == pf.PixelRepresentation;
225 }
226 bool operator!=(const PixelFormat &pf) const
227 {
228     return
229         SamplesPerPixel != pf.SamplesPerPixel ||
230         BitsAllocated != pf.BitsAllocated ||
231         BitsStored != pf.BitsStored ||
232         HighBit != pf.HighBit ||
233         PixelRepresentation != pf.PixelRepresentation;
234 }
235
236 bool IsCompatible(const TransferSyntax & ts ) const;
237 protected:
238 bool Validate();
239
240 private:
241 // D 0028|0002 [US] [Samples per Pixel] [1]
242 unsigned short SamplesPerPixel;
243 // D 0028|0100 [US] [Bits Allocated] [8]
244 unsigned short BitsAllocated;
245 // D 0028|0101 [US] [Bits Stored] [8]
246 unsigned short BitsStored;
247 // D 0028|0102 [US] [High Bit] [7]
248 unsigned short HighBit;
249 // D 0028|0103 [US] [Pixel Representation] [0]
250 unsigned short PixelRepresentation;
251 };
252 //-----
253 inline std::ostream& operator<<(std::ostream &os, const PixelFormat &pf)
254 {
255     pf.Print( os );
256     return os;
257 }
258
259
260 } // end namespace gdcm
261
262 #endif //GDCMPIXELFORMAT_H

```

## 11.377 gdcmPixmap.h File Reference

```

#include "gdcmBitmap.h"
#include "gdcmCurve.h"
#include "gdcmIconImage.h"
#include "gdcmOverlay.h"

```

Include dependency graph for gdcmPixmap.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Pixmap](#)  
*Pixmap* class.

## Namespaces

- namespace [gdcm](#)

## 11.378 gdcmPixmap.h

[Go to the documentation of this file.](#)

```

1  /*****
2
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4
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11 PURPOSE.  See the above copyright notice for more information.
12
13 *****/
14 #ifndef GDCMPIXMAP_H
15 #define GDCMPIXMAP_H
16
17 #include "gdcmBitmap.h"
18 #include "gdcmCurve.h"
19 #include "gdcmIconImage.h"
20 #include "gdcmOverlay.h"
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT Pixmap : public Bitmap
26 {
27 public:
28     Pixmap();
29     ~Pixmap() override;
30     void Print(std::ostream &) const override;
31
32     bool AreOverlaysInPixelData() const override;
33     bool UnusedBitsPresentInPixelData() const override;
34
35     Curve& GetCurve(size_t i = 0) {
36         assert( i < Curves.size() );
37         return Curves[i];
38     }
39     const Curve& GetCurve(size_t i = 0) const {
40         assert( i < Curves.size() );
41         return Curves[i];
42     }
43     size_t GetNumberOfCurves() const { return Curves.size(); }
44     void SetNumberOfCurves(size_t n) { Curves.resize(n); }
45
46     Overlay& GetOverlay(size_t i = 0) {
47         assert( i < Overlays.size() );
48         return Overlays[i];
49     }
50     const Overlay& GetOverlay(size_t i = 0) const {
51         assert( i < Overlays.size() );
52         return Overlays[i];
53     }
54     size_t GetNumberOfOverlays() const { return Overlays.size(); }
55     void SetNumberOfOverlays(size_t n) { Overlays.resize(n); }
56     void RemoveOverlay(size_t i) {
57         assert( i < Overlays.size() );
58         Overlays.erase( Overlays.begin() + i );
59     }
60
61     const IconImage &GetIconImage() const { return *Icon; }
62     IconImage &GetIconImage() { return *Icon; }
63     void SetIconImage(IconImage const &ii) { Icon = ii; }
64
65 private:
66     protected:
67     std::vector<Overlay> Overlays;

```

```

80  std::vector<Curve>  Curves;
81  SmartPointer<IconImage> Icon;
82 };
83
84 } // end namespace gdcM
85
86 #endif //GDCMPIXMAP_H

```

## 11.379 gdcMPixmapReader.h File Reference

```

#include "gdcMReader.h"
#include "gdcMPixmap.h"

```

Include dependency graph for gdcMPixmapReader.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcM::PixmapReader](#)  
*PixmapReader.*

### Namespaces

- namespace [gdcM](#)

## 11.380 gdcMPixmapReader.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPIXMAPREADER_H
15 #define GDCMPIXMAPREADER_H
16
17 #include "gdcMReader.h"
18 #include "gdcMPixmap.h"
19
20 namespace gdcM
21 {
22
23 class ByteValue;
24 class MediaStorage;
25 class GDCM_EXPORT PixmapReader : public Reader
26 {
27 public:
28     PixmapReader();
29     ~PixmapReader() override; //needs to be virtual to ensure lack of memory leaks
30
31     bool Read() override;
32
33 };
34
35 }
36
37 #endif

```

```

52 // Following methods are valid only after a call to 'Read'
53
54 const Pixmap& GetPixmap() const;
55 Pixmap& GetPixmap();
56 //void SetPixamp(Pixmap const &pix);
57
58 protected:
59 bool ReadImageInternal(MediaStorage const &ms, bool handlepixeldata = true);
60 virtual bool ReadImage(MediaStorage const &ms);
61 virtual bool ReadACRNEMAIImage();
62
63 SmartPointer<Pixmap> PixelData;
64 };
65
66 } // end namespace gdcm
67
68 #endif //GDCMPIXMAPREADER_H

```

## 11.381 gdcmPixmapToPixmapFilter.h File Reference

#include "gdcmBitmapToBitmapFilter.h"

Include dependency graph for gdcmPixmapToPixmapFilter.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::PixmapToPixmapFilter](#)  
*PixmapToPixmapFilter* class.

### Namespaces

- namespace [gdcm](#)

## 11.382 gdcmPixmapToPixmapFilter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPIXMAPTOPIXMAPFILTER_H
15 #define GDCMPIXMAPTOPIXMAPFILTER_H
16
17 #include "gdcmBitmapToBitmapFilter.h"
18
19 namespace gdcm
20 {
21
22 class Pixmap;
23
24 class GDCM_EXPORT PixmapToPixmapFilter : public BitmapToBitmapFilter

```

```

28 {
29 public:
30     PixmapToPixmapFilter();
31     ~PixmapToPixmapFilter() = default;
32
33     Pixmap &GetInput();
34
35     const Pixmap &GetOutput() const;
36
37     // SWIG/Java hack:
38     const Pixmap &GetOutputAsPixmap() const;
39 };
40
41 // end namespace gdcm
42 #endif //GDCMPIXMAPTOPIXMAPFILTER_H

```

## 11.383 gdcmPixmapWriter.h File Reference

```

#include "gdcmWriter.h"
#include "gdcmPixmap.h"

```

Include dependency graph for gdcmPixmapWriter.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::PixmapWriter](#)  
*PixmapWriter.*

### Namespaces

- namespace [gdcm](#)

## 11.384 gdcmPixmapWriter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPIXMAPWRITER_H
15 #define GDCMPIXMAPWRITER_H
16
17 #include "gdcmWriter.h"
18 #include "gdcmPixmap.h"
19
20 namespace gdcm
21 {
22
23 class StreamImageWriter;
24 class Pixmap;

```



```

36 class GDCM_EXPORT PixmapWriter : public Writer
37 {
38 public:
39     PixmapWriter();
40     ~PixmapWriter() override;
41
42     const Pixmap& GetPixmap()const { return *PixelData; }
43     Pixmap& GetPixmap() { return *PixelData; } // FIXME
44     void SetPixmap(Pixmap const &img);
45
46     virtual const Pixmap& GetImage()const { return *PixelData; }
47     virtual Pixmap& GetImage() { return *PixelData; } // FIXME
48     virtual void SetImage(Pixmap const &img);
49
50     bool Write() override; // Execute()
51
52 protected:
53     void DoIconImage(DataSet & ds, Pixmap const & image);
54     bool PrepareWrite( MediaStorage const & refms );
55
56     SmartPointer<Pixmap> PixelData;
57 };
58 // end namespace gdcm
59 #endif //GDCMPIXMAPWRITER_H

```

## 11.385 gdcmPNMCodec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmPNMCodec.h:

### Classes

- class [gdcm::PNMCodec](#)  
*Class to do PNM.*

### Namespaces

- namespace [gdcm](#)

## 11.386 gdcmPNMCodec.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPNMCODEC_H
15 #define GDCMPNMCODEC_H

```

```

16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT PNMCodec : public ImageCodec
23 {
24 public:
25     PNMCodec();
26     ~PNMCodec() override;
27     bool CanDecode(TransferSyntax const &ts) const override;
28     bool CanCode(TransferSyntax const &ts) const override;
29
30     unsigned long GetBufferLength()const { return BufferLength; }
31     void SetBufferLength(unsigned long l) { BufferLength = l; }
32
33     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
34     ImageCodec * Clone() const override;
35
36     bool Read(const char *filename, DataElement &out) const;
37     bool Write(const char *filename, const DataElement &out) const;
38     //bool Write(const char *filename);
39 private:
40     unsigned long BufferLength;
41 };
42
43 } // end namespace gdcm
44
45 #endif //GDCMPNMCODEC_H

```

## 11.387 gdcmPrinter.h File Reference

```

#include "gdcmFile.h"
#include "gdcmDataElement.h"

```

Include dependency graph for gdcmPrinter.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Printer](#)  
*Printer class.*

### Namespaces

- namespace [gdcm](#)

## 11.388 gdcmPrinter.h

[Go to the documentation of this file.](#)

```

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```

```

11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPRINTER_H
15 #define GDCMPRINTER_H
16
17 // TODO Class to implement printing
18 // Since DICOM does printing ?
19 // Also I would like to encapsulate the IsCharacterPrintable thing
20 // (to avoid printing \0 and other weird characters)
21 // \todo I still need to implement skipping of group (shadow)
22 // need to implement longer field to read
23
24 /*
25 * Output:
26 * For ASCII:
27 * Typically will look like:
28 * [ORIGINAL\PRIMARY\OTHER]
29 * If a non printable character is found: RED and INVERSE is used:
30 * [
31 *
32 * when the VR is not found (file or dict), we check if we can print the output:
33 * on success ASCII mode is used, on failure the output is printed a series of bytes
34 *
35 * Special case when the data element is empty:
36 * INVERSE « (no value)
37 *
38 * retired public element are printed in red and underline
39 * unknown private element are printed in RED followed by 'UNKNOWN'
40 *
41 * Correct VR is printed in green just after the found VR
42 *
43 * length of data element is printed in bytes, followed by the VM, a green VM is appended
44 * if this is not compatible
45 */
46 #include "gdcMFile.h"
47 #include "gdcMDataElement.h"
48
49 namespace gdcM
50 {
51
52 class DataSet;
53 class DictEntry;
54 class Dicts;
55
56 // It's a sink there is no output
57 class GDCM_EXPORT Printer
58 {
59 public:
60     Printer();
61     ~Printer();
62
63     void SetFile(File const &f) { F = &f; }
64
65     void SetColor(bool c);
66
67     typedef enum {
68         VERBOSE_STYLE = 0, // GDCM Legacy VERBOSE one
69         CONDENSED_STYLE, //
70         // Ok I am missing voc here ...better naming would be nice
71         XML, //
72         CXX
73     } PrintStyles;
74
75     void SetStyle(PrintStyles ps) {
76         PrintStyle = ps;
77     }
78
79     PrintStyles GetPrintStyle() const {
80         return PrintStyle;
81     }
82
83     void Print(std::ostream& os);
84
85     void PrintDataSet(const DataSet &ds, std::ostream& os, const std::string &s = "");
86
87 protected:
88     VR PrintDataElement(std::ostream& os, const Dicts &dicts, const DataSet &ds, const DataElement &de,
89         std::ostream& out, std::string const &indent);
90     void PrintSQ(const SequenceOfItems *sqi, std::ostream& os, std::string const &indent);
91
92     PrintStyles PrintStyle;
93     const File *F;

```

```

100     VL MaxPrintLength;
101 };
102
103 } // end namespace gdcms
104
105 #endif //GDCMPRINTER_H

```

## 11.389 gdcmsPVRGCodec.h File Reference

#include "gdcmsImageCodec.h"

Include dependency graph for gdcmsPVRGCodec.h:

### Classes

- class [gdcms::PVRGCodec](#)  
*PVRGCodec.*

### Namespaces

- namespace [gdcms](#)

## 11.390 gdcmsPVRGCodec.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPVRGCODEC_H
15 #define GDCMPVRGCODEC_H
16
17 #include "gdcmsImageCodec.h"
18
19 namespace gdcms
20 {
21
22     class PVRGCodec : public ImageCodec
23     {
24     public:
25         PVRGCodec();
26         ~PVRGCodec() override;
27         bool CanDecode(TransferSyntax const &ts) const override;
28         bool CanCode(TransferSyntax const &ts) const override;
29
30         bool Decode(DataElement const &is, DataElement &os) override;
31         bool Code(DataElement const &in, DataElement &out) override;
32         void SetLossyFlag( bool l );
33
34         ImageCodec * Clone() const override;
35     private:
36     };
37
38 } // end namespace gdcms
39
40 #endif //GDCMPVRGCODEC_H

```

## 11.391 gdcmRAWCodec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmRAWCodec.h:

### Classes

- class [gdcm::RAWCodec](#)  
*RAWCodec* class.

### Namespaces

- namespace [gdcm](#)

## 11.392 gdcmRAWCodec.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMRAWCODEC_H
15 #define GDCMRAWCODEC_H
16
17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22 class RAWInternals;
23
24 class GDCM_EXPORT RAWCodec : public ImageCodec
25 {
26 public:
27     RAWCodec();
28     ~RAWCodec() override;
29     bool CanCode(TransferSyntax const &ts) const override;
30     bool CanDecode(TransferSyntax const &ts) const override;
31     bool Decode(DataElement const &is, DataElement &os) override;
32     bool Code(DataElement const &in, DataElement &out) override;
33
34     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
35     ImageCodec * Clone() const override;
36
37     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
38
39 protected:
40     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
41
42 private:
43     RAWInternals *Internals;
44 };
45
46 // end namespace gdcm
47
48 #endif // GDCMRAWCODEC_H

```

## 11.393 gdcmRescaler.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmPixelFormat.h"
```

Include dependency graph for gdcmRescaler.h:

### Classes

- class [gdcm::Rescaler](#)  
*Rescale class.*

### Namespaces

- namespace [gdcm](#)

## 11.394 gdcmRescaler.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMRESCALER_H
15 #define GDCMRESCALER_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmPixelFormat.h"
19
20 namespace gdcm
21 {
22
23     class GDCM_EXPORT Rescaler
24     {
25     public:
26         Rescaler(): Intercept(0), Slope(1), PF(PixelFormat::UNKNOWN), TargetScalarType(PixelFormat::UNKNOWN),
27             ScalarRangeMin(0), ScalarRangeMax(0), UseTargetPixelType(false) {}
28         ~Rescaler() = default;
29
30         bool Rescale(char *out, const char *in, size_t n);
31
32         bool InverseRescale(char *out, const char *in, size_t n);
33
34         void SetIntercept(double i) { Intercept = i; }
35         double GetIntercept() const { return Intercept; }
36
37         void SetSlope(double s) { Slope = s; }
38         double GetSlope() const { return Slope; }
39
40         void SetTargetPixelType( PixelFormat const & targetst );
41
42         void SetUseTargetPixelType(bool b);
43
44         void SetPixelFormat(PixelFormat const & pf) { PF = pf; }
45
46     };
47
48 }
```

```

102 PixelFormat::ScalarType ComputeInterceptSlopePixelType();
103
106 void SetMinMaxForPixelType(double min, double max);
107
110 PixelFormat ComputePixelTypeFromMinMax();
111
112 protected:
113     template <typename TIn>
114         void RescaleFunctionIntoBestFit(char *out, const TIn *in, size_t n);
115     template <typename TIn>
116         void InverseRescaleFunctionIntoBestFit(char *out, const TIn *in, size_t n);
117
118 private:
119     double Intercept; // 0028,1052
120     double Slope;     // 0028,1053
121     PixelFormat PF;
122     PixelFormat::ScalarType TargetScalarType;
123     double ScalarRangeMin;
124     double ScalarRangeMax;
125     bool UseTargetPixelType;
126 };
127
128 } // end namespace gdcm
129
130 #endif //GDCMRLECODEC_H

```

## 11.395 gdcmRLECodec.h File Reference

#include "gdcmImageCodec.h"

Include dependency graph for gdcmRLECodec.h:

### Classes

- class [gdcm::RLECodec](#)  
*Class to do RLE.*

### Namespaces

- namespace [gdcm](#)

## 11.396 gdcmRLECodec.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMRLECODEC_H
15 #define GDCMRLECODEC_H
16

```

```

17 #include "gdcmImageCodec.h"
18
19 namespace gdcm
20 {
21
22 class Fragment;
23 class RLEInternals;
24
25 class GDCM_EXPORT RLECodec : public ImageCodec
26 {
27 public:
28     RLECodec();
29     ~RLECodec() override;
30     bool CanCode(TransferSyntax const &ts) const override;
31     bool CanDecode(TransferSyntax const &ts) const override;
32     bool Decode(DataElement const &is, DataElement &os) override;
33     unsigned long GetBufferLength() const { return BufferLength; }
34     void SetBufferLength(unsigned long l) { BufferLength = l; }
35
36     bool Code(DataElement const &in, DataElement &out) override;
37     bool GetHeaderInfo(std::istream &is, TransferSyntax &ts) override;
38     ImageCodec * Clone() const override;
39
40 protected:
41     bool DecodeExtent(
42         char *buffer,
43         unsigned int XMin, unsigned int XMax,
44         unsigned int YMin, unsigned int YMax,
45         unsigned int ZMin, unsigned int ZMax,
46         std::istream & is
47     );
48
49     bool DecodeByStreams(std::istream &is, std::ostream &os) override;
50 public:
51     void SetLength(unsigned long l)
52     {
53         Length = l;
54     }
55
56 protected:
57     bool StartEncode( std::ostream & ) override;
58     bool IsRowEncoder() override;
59     bool IsFrameEncoder() override;
60     bool AppendRowEncode( std::ostream & out, const char * data, size_t datalen ) override;
61     bool AppendFrameEncode( std::ostream & out, const char * data, size_t datalen ) override;
62     bool StopEncode( std::ostream & ) override;
63
64 private:
65     bool DecodeByStreamsCommon(std::istream &is, std::ostream &os);
66     RLEInternals *Internals;
67     unsigned long Length;
68     unsigned long BufferLength;
69     size_t DecodeFragment(Fragment const & frag, char *buffer, size_t llen);
70 };
71
72 } // end namespace gdcm
73
74 #endif //GDCMRLECODEC_H

```

## 11.397 gdcmScanner.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>
#include <set>
#include <string>
#include <string.h>

```

Include dependency graph for gdcmScanner.h:



## Classes

- struct [gdcm::Scanner::ltstr](#)
- class [gdcm::Scanner](#)  
[Scanner](#).

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<< \(std::ostream &os, const Scanner &s\)](#)

## 11.398 gdcmScanner.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSCANNER_H
15 #define GDCMSCANNER_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmSubject.h"
19 #include "gdcmTag.h"
20 #include "gdcmPrivateTag.h"
21 #include "gdcmSmartPointer.h"
22
23 #include <map>
24 #include <set>
25 #include <string>
26
27 #include <string.h> // strcmp
28
29 namespace gdcm
30 {
31 class StringFilter;
32
33 class GDCM_EXPORT Scanner : public Subject
34 {
35     friend std::ostream& operator<<(std::ostream &os, const Scanner &s);
36 public:
37     Scanner():Values(), Filenames(), Mappings() {}
38     ~Scanner() override;
39
40     typedef std::map<Tag, const char*> TagToValue;
41     //typedef std::map<Tag, ConstCharWrapper> TagToValue; //StringMap;
42     //typedef TagToStringMap TagToValue;
43     typedef TagToValue::value_type TagToValueValueType;
44
45     void AddTag( Tag const & t );
46     void ClearTags();
47

```

```

77 // Work in progress do not use:
78 void AddPrivateTag( PrivateTag const & t );
79
80 void AddSkipTag( Tag const & t );
81 void ClearSkipTags();
82
83
84 bool Scan( Directory::FileNamesType const & filenames );
85
86 Directory::FileNamesType const &GetFileNames()const { return FileNames; }
87
88 void Print( std::ostream & os ) const override;
89
90 void PrintTable( std::ostream & os ) const;
91
92 bool IsKey( const char * filename ) const;
93
94 Directory::FileNamesType GetKeys() const;
95
96 // struct to store all the values found:
97 typedef std::set< std::string > ValuesType;
98
99 ValuesType const & GetValues()const { return Values; }
100
101 ValuesType GetValues(Tag const &t) const;
102
103 Directory::FileNamesType GetOrderedValues(Tag const &t) const;
104
105 /* ltstr is CRITICAL, otherwise pointers value are used to do the key comparison */
106 struct ltstr
107 {
108     bool operator()(const char* s1, const char* s2)const
109 {
110     assert( s1 && s2 );
111     return strcmp(s1, s2) < 0;
112 }
113 };
114
115 typedef std::map<const char *,TagToValue, ltstr> MappingType;
116 typedef MappingType::const_iterator ConstIterator;
117 ConstIterator Begin()const { return Mappings.begin(); }
118 ConstIterator End()const { return Mappings.end(); }
119
120 MappingType const & GetMappings()const { return Mappings; }
121
122 TagToValue const & GetMapping(const char *filename) const;
123
124 const char *GetFilenameFromTagToValue(Tag const &t, const char *valueref) const;
125
126 Directory::FileNamesType GetAllFileNamesFromTagToValue(Tag const &t, const char *valueref) const;
127
128 // by a call to GetMapping()
129 TagToValue const & GetMappingFromTagToValue(Tag const &t, const char *value) const;
130
131 const char* GetValue(const char *filename, Tag const &t) const;
132
133 static SmartPointer<Scanner> New() { return new Scanner; }
134
135 protected:
136 void ProcessPublicTag(StringFilter &sf, const char *filename);
137 private:
138 // struct to store all uniq tags in ascending order:
139 typedef std::set< Tag > TagsType;
140 typedef std::set< PrivateTag > PrivateTagsType;
141 std::set< Tag > Tags;
142 std::set< PrivateTag > PrivateTags;
143 std::set< Tag > SkipTags;
144 ValuesType Values;
145 Directory::FileNamesType FileNames;
146
147 // Main struct that will hold all mapping:
148 MappingType Mappings;
149
150 double Progress;
151 };
152
153 //-----
154 inline std::ostream& operator<(std::ostream &os, const Scanner &s)
155 {
156     s.Print( os );
157     return os;
158 }
159
160 #if defined(SWIGPYTHON) || defined(SWIGCSHARP) || defined(SWIGJAVA) || defined(SWIGPHP)

```

```

184 /*
185 * HACK: I need this temp class to be able to manipulate a std::map from python,
186 * swig does not support wrapping of simple class like std::map...
187 */
188 class SWIGTagToValue
189 {
190 public:
191     SWIGTagToValue(Scanner::TagToValue const &t2v):Internal(t2v),it(t2v.begin()) {}
192     const Scanner::TagToValueValueType& GetCurrent()const { return *it; }
193     const Tag& GetCurrentTag()const { return it->first; }
194     const char *GetCurrentValue()const { return it->second; }
195     void Start() { it = Internal.begin(); }
196     bool IsAtEnd()const { return it == Internal.end(); }
197     void Next() { ++it; }
198 private:
199     const Scanner::TagToValue& Internal;
200     Scanner::TagToValue::const_iterator it;
201 };
202 #endif /* SWIG */
203
209 } // end namespace gdcm
210
211 #endif //GDCMSCANNER_H

```

## 11.399 gdcmScanner2.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>
#include <set>
#include <string>
#include <string.h>
Include dependency graph for gdcmScanner2.h:

```

### Classes

- struct [gdcm::Scanner2::ltstr](#)
- class [gdcm::Scanner2](#)  
*Scanner2.*

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const Scanner2 &s)

## 11.400 gdcmScanner2.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSCANNER2_H
15 #define GDCMSCANNER2_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmSubject.h"
19 #include "gdcmTag.h"
20 #include "gdcmPrivateTag.h"
21 #include "gdcmSmartPointer.h"
22
23 #include <map>
24 #include <set>
25 #include <string>
26
27 #include <string.h> // strcmp
28
29 namespace gdcm
30 {
31 class StringFilter;
32
33 class GDCM_EXPORT Scanner2 : public Subject
34 {
35     friend std::ostream& operator<<(std::ostream &_os, const Scanner2 &s);
36 public:
37     Scanner2():Values(), Filenames(), PublicMappings(), PrivateMappings() {}
38     ~Scanner2() override;
39
40     typedef std::map<Tag, const char*> PublicTagToValue;
41     typedef PublicTagToValue::value_type PublicTagToValueValueType;
42
43     typedef std::map<PrivateTag, const char*> PrivateTagToValue;
44     typedef PrivateTagToValue::value_type PrivateTagToValueValueType;
45
46     bool AddPublicTag( Tag const & t );
47     void ClearPublicTags();
48
49     // Work in progress do not use:
50     bool AddPrivateTag( PrivateTag const & pt );
51     void ClearPrivateTags();
52
53     bool AddSkipTag( Tag const & t );
54     void ClearSkipTags();
55
56     bool Scan( Directory::FilenamesType const & filenames );
57
58     Directory::FilenamesType const &GetFilenames()const { return Filenames; }
59
60     void Print( std::ostream & os ) const override;
61
62     void PrintTable( std::ostream & os, bool header = false ) const;
63
64     bool IsKey( const char * filename ) const;
65
66     Directory::FilenamesType GetKeys() const;
67
68     // struct to store all the values found:
69     typedef std::set< std::string > ValueType;
70
71     ValueType const & GetValues()const { return Values; }
72
73     ValueType GetPublicValues(Tag const &t) const;
74
75     ValueType GetPrivateValues(PrivateTag const &pt) const;
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118

```

```

122 Directory::FileNamesType GetPublicOrderedValues(Tag const &t) const;
123
124 Directory::FileNamesType GetPrivateOrderedValues(PrivateTag const &pt) const;
125
126 /* ltstr is CRITICAL, otherwise pointers value are used to do the key comparison */
127 struct ltstr
128 {
129     bool operator()(const char* s1, const char* s2) const
130 {
131     assert( s1 && s2 );
132     return strcmp(s1, s2) < 0;
133 }
134 };
135 typedef std::map<const char *,PublicTagToValue, ltstr> PublicMappingType;
136 typedef PublicMappingType::const_iterator PublicConstIterator;
137 PublicConstIterator Begin()const { return PublicMappings.begin(); }
138 PublicConstIterator End()const { return PublicMappings.end(); }
139
140 typedef std::map<const char *,PrivateTagToValue, ltstr> PrivateMappingType;
141 typedef PrivateMappingType::const_iterator PrivateConstIterator;
142 PrivateConstIterator PrivateBegin()const { return PrivateMappings.begin(); }
143 PrivateConstIterator PrivateEnd()const { return PrivateMappings.end(); }
144
145 PublicMappingType const & GetPublicMappings()const { return PublicMappings; }
146 PrivateMappingType const & GetPrivateMappings()const { return PrivateMappings; }
147
148 PublicTagToValue const & GetPublicMapping(const char *filename) const;
149 PrivateTagToValue const & GetPrivateMapping(const char *filename) const;
150
151 const char *GetFilenameFromPublicTagToValue(Tag const &t, const char *valueref) const;
152 const char *GetFilenameFromPrivateTagToValue(PrivateTag const &pt, const char *valueref) const;
153
154 Directory::FileNamesType GetAllFileNamesFromPublicTagToValue(Tag const &t, const char *valueref) const;
155 Directory::FileNamesType GetAllFileNamesFromPrivateTagToValue(PrivateTag const &pt, const char *valueref)
156 const;
157
158 // by a call to GetMapping()
159 PublicTagToValue const & GetMappingFromPublicTagToValue(Tag const &t, const char *value) const;
160 PrivateTagToValue const & GetMappingFromPrivateTagToValue(PrivateTag const &pt, const char *value) const;
161
162 const char* GetPublicValue(const char *filename, Tag const &t) const;
163 const char* GetPrivateValue(const char *filename, PrivateTag const &pt) const;
164
165 static SmartPointer<Scanner2> New() { return new Scanner2; }
166
167 protected:
168 void ProcessPublicTag(StringFilter &sf, const char *filename);
169 void ProcessPrivateTag(StringFilter &sf, const char *filename);
170 private:
171 // struct to store all uniq tags in ascending order:
172 typedef std::set< Tag > PublicTagsType;
173 typedef std::set< PrivateTag > PrivateTagsType;
174 std::set< Tag > PublicTags; // Public and Private Creator
175 std::set< PrivateTag > PrivateTags; // Only Private (no Private Creator)
176 std::set< Tag > SkipTags;
177 ValuesType Values;
178 Directory::FileNamesType Filenames;
179
180 // Main struct that will hold all public mapping:
181 PublicMappingType PublicMappings;
182 // Main struct that will hold all private mapping:
183 PrivateMappingType PrivateMappings;
184
185 double Progress;
186 };
187 //-----
188 inline std::ostream& operator<<(std::ostream &os, const Scanner2 &s)
189 {
190     s.Print( os );
191     return os;
192 }
193
194 } // end namespace gdcmscanner2
195 #endif //GDCMSCANNER2_H

```

## 11.401 gdcmSegment.h File Reference

```
#include <vector>
#include <gdcmObject.h>
#include <gdcmSurface.h>
#include "gdcmSegmentHelper.h"
```

Include dependency graph for gdcmSegment.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Segment](#)  
*This class defines a segment.*

### Namespaces

- namespace [gdcm](#)

## 11.402 gdcmSegment.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSEGMENT_H
15 #define GDCMSEGMENT_H
16
17 #include <vector>
18
19 #include <gdcmObject.h>
20 #include <gdcmSurface.h>
21 #include "gdcmSegmentHelper.h"
22
23 namespace gdcm
24 {
25
26     class GDCM_EXPORT Segment : public Object
27     {
28     public:
29
30         typedef std::vector<SmartPointer< Surface > > SurfaceVector;
31         typedef std::vector< SegmentHelper::BasicCodedEntry > BasicCodedEntryVector;
32
33         typedef enum {
34             AUTOMATIC = 0,
35             SEMIAUTOMATIC,
36             MANUAL,
37             ALGOType_END
38         } ALGOType;
39
40         static const char * GetALGOTypeString(ALGOType type);
41         static ALGOType GetALGOType(const char * type);
42
43     };
44
45 }
```

```

50
51 Segment();
52
53 ~Segment() override;
54
55 /**      Segment getters/setters      **//
56 unsigned short GetSegmentNumber() const;
57 void SetSegmentNumber(const unsigned short num);
58
59 const char * GetSegmentLabel() const;
60 void SetSegmentLabel(const char * label);
61
62 const char * GetSegmentDescription() const;
63 void SetSegmentDescription(const char * description);
64
65 SegmentHelper::BasicCodedEntry const & GetAnatomicRegion() const;
66 SegmentHelper::BasicCodedEntry & GetAnatomicRegion();
67 void SetAnatomicRegion(SegmentHelper::BasicCodedEntry const & BSE);
68
69 BasicCodedEntryVector const & GetAnatomicRegionModifiers() const;
70 BasicCodedEntryVector & GetAnatomicRegionModifiers();
71 void SetAnatomicRegionModifiers(BasicCodedEntryVector const & BSEV);
72
73 SegmentHelper::BasicCodedEntry const & GetPropertyCategory() const;
74 SegmentHelper::BasicCodedEntry & GetPropertyCategory();
75 void SetPropertyCategory(SegmentHelper::BasicCodedEntry const & BSE);
76
77 SegmentHelper::BasicCodedEntry const & GetPropertyType() const;
78 SegmentHelper::BasicCodedEntry & GetPropertyType();
79 void SetPropertyType(SegmentHelper::BasicCodedEntry const & BSE);
80
81 BasicCodedEntryVector const & GetPropertyTypeModifiers() const;
82 BasicCodedEntryVector & GetPropertyTypeModifiers();
83 void SetPropertyTypeModifiers(BasicCodedEntryVector const & BSEV);
84
85 ALGOType GetSegmentAlgorithmType() const;
86 void SetSegmentAlgorithmType(ALGOType type);
87 void SetSegmentAlgorithmType(const char * typeStr);
88
89 const char * GetSegmentAlgorithmName() const;
90 void SetSegmentAlgorithmName(const char * name);
91
92 /**      Surface getters/setters      **//
93 unsigned long GetSurfaceCount();
94 void SetSurfaceCount(const unsigned long nb);
95
96 SurfaceVector const & GetSurfaces() const;
97 SurfaceVector & GetSurfaces();
98
99 SmartPointer< Surface > GetSurface(const unsigned int idx = 0) const;
100
101 void AddSurface(SmartPointer< Surface > surface);
102
103 protected :
104 /**      Segment members      **//
105 //0062 0004 US 1 Segment Number
106 unsigned short SegmentNumber;
107 //0062 0005 LO 1 Segment Label
108 std::string SegmentLabel;
109 //0062 0006 ST 1 Segment Description
110 std::string SegmentDescription;
111
112 // General Anatomic Region
113 SegmentHelper::BasicCodedEntry AnatomicRegion;
114 // General Anatomic Region Modifier
115 BasicCodedEntryVector AnatomicRegionModifiers;
116 // Property Category Code
117 SegmentHelper::BasicCodedEntry PropertyCategory;
118 // Property Type Code
119 SegmentHelper::BasicCodedEntry PropertyType;
120 // Property Type Modifier Code
121 BasicCodedEntryVector PropertyTypeModifiers;
122
123 //0062 0008 CS 1 Segment Algorithm Type
124 ALGOType SegmentAlgorithmType;
125 //0062 0009 LO 1 Segment Algorithm Name
126 std::string SegmentAlgorithmName;
127
128 /**      Surface members      **//
129 //0066 002a UL 1 Surface Count
130 unsigned long SurfaceCount;

```

```

131
132     SurfaceVector   Surfaces;
133
134 private :
135     void ComputeSurfaceCount();
136 };
137
138 }
139
140 #endif // GDCMSEGMENT_H

```

## 11.403 gdcmSegmentedPaletteColorLookupTable.h File Reference

#include "gdcmLookupTable.h"

Include dependency graph for gdcmSegmentedPaletteColorLookupTable.h:

### Classes

- class [gdcm::SegmentedPaletteColorLookupTable](#)  
*SegmentedPaletteColorLookupTable* class.

### Namespaces

- namespace [gdcm](#)

## 11.404 gdcmSegmentedPaletteColorLookupTable.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14
15 #ifndef GDCMSEGMENTEDPALETTECOLORLOOKUPTABLE_H
16 #define GDCMSEGMENTEDPALETTECOLORLOOKUPTABLE_H
17
18 #include "gdcmLookupTable.h"
19
20 namespace gdcm
21 {
22
23     class GDCM_EXPORT SegmentedPaletteColorLookupTable : public LookupTable
24     {
25     public:
26         SegmentedPaletteColorLookupTable();
27         ~SegmentedPaletteColorLookupTable() override;
28         void Print(std::ostream &) const override {}
29
30         void SetLUT(LookupTableType type, const unsigned char *array,
31                     unsigned int length) override;
32
33     };
34
35 } // end namespace gdcm
36
37 #endif //GDCMSEGMENTEDPALETTECOLORLOOKUPTABLE_H

```



## 11.405 gdcmSegmentHelper.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <string>
```

Include dependency graph for gdcmSegmentHelper.h: This graph shows which files directly or indirectly include this file:

### Classes

- struct [gdcm::SegmentHelper::BasicCodedEntry](#)

*This structure defines a basic coded entry with all of its attributes.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::SegmentHelper](#)

## 11.406 gdcmSegmentHelper.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSEGMENTHELPER_H
15 #define GDCMSEGMENTHELPER_H
16
17 #include "gdcmTypes.h"
18
19 #include <string>
20
21 namespace gdcm
22 {
23
24     namespace SegmentHelper
25     {
26
27         struct GDCM_EXPORT BasicCodedEntry
28         {
29             BasicCodedEntry() :
30                 CV(""),
31                 CSD(""),
32                 CSV(""),
33                 CM("")
34             {}
35
36             BasicCodedEntry(const char * a_CV,
37                             const char * a_CSD,
38                             const char * a_CM) :
39                 CV(a_CV),
40                 CSD(a_CSD),
41                 CSV(""),
42                 CM(a_CM)
43             {}
44         };
45     };
46 }
```

```

54  {}
55
59  BasicCodedEntry(const char * a_CV,
60                  const char * a_CSD,
61                  const char * a_CSV,
62                  const char * a_CM) :
63      CV(a_CV),
64      CSD(a_CSD),
65      CSV(a_CSV),
66      CM(a_CM)
67  {}
68
74  bool IsEmpty(const bool checkOptionalAttributes = false) const;
75
76
77  /**      Members      **/
78  // 0008 0100 1   Code Value
79  std::string CV;
80  // 0008 0102 1   Coding Scheme Designator
81  std::string CSD;
82  // 0008 0103 1C Coding Scheme Version
83  std::string CSV;
84  // 0008 0104 1   Code Meaning
85  std::string CM;
86 };
87
88 } // end of SegmentHelper namespace
89
90 } // end of gdcm namespace
91
92 #endif // GDCMSEGMENTHELPER_H

```

## 11.407 gdcmSegmentReader.h File Reference

```

#include <map>
#include <gdcmReader.h>
#include <gdcmSegment.h>

```

Include dependency graph for gdcmSegmentReader.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::SegmentReader](#)  
*This class defines a segment reader.*

### Namespaces

- namespace [gdcm](#)

## 11.408 gdcmSegmentReader.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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```

```

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8
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSEGMENTREADER_H
15 #define GDCMSEGMENTREADER_H
16
17 #include <map>
18
19 #include <gdcmReader.h>
20 #include <gdcmSegment.h>
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT SegmentReader : public Reader
26 {
27 public:
28     typedef std::vector< SmartPointer< Segment > > SegmentVector;
29
30     SegmentReader();
31
32     ~SegmentReader() override;
33
34     bool Read() override; // Set to protected ?
35
36     /**      Segment getters/setters      **/
37     const SegmentVector GetSegments() const;
38     SegmentVector GetSegments();
39
40     // unsigned int GetNumberOfSegments();
41
42 protected:
43
44     typedef std::map< unsigned long, SmartPointer< Segment > > SegmentMap;
45
46     bool ReadSegments();
47
48     bool ReadSegment(const Item & segmentItem, const unsigned int idx);
49
50     SegmentMap Segments; // The key value is item number (in segment sequence)
51                          // or the surface number (for a surface segmentation).
52 };
53
54 #endif // GDCMSEGMENTREADER_H

```

## 11.409 gdcmSegmentWriter.h File Reference

```

#include <gdcmWriter.h>
#include <gdcmSegment.h>

```

Include dependency graph for gdcmSegmentWriter.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::SegmentWriter](#)  
*This class defines a segment writer.*

### Namespaces

- namespace [gdcm](#)

## 11.410 gdcmSegmentWriter.h

[Go to the documentation of this file.](#)

```

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8
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSEGMENTWRITER_H
15 #define GDCMSEGMENTWRITER_H
16
17 #include <gdcmWriter.h>
18 #include <gdcmSegment.h>
19
20 namespace gdcm
21 {
22
23 class GDCM_EXPORT SegmentWriter : public Writer
24 {
25 public:
26     typedef std::vector<SmartPointer<Segment>> SegmentVector;
27
28     SegmentWriter();
29
30     ~SegmentWriter() override;
31
32     bool Write() override; // Set to protected ?
33
34     /** Segment getters/setters */
35     unsigned int GetNumberOfSegments() const;
36     void SetNumberOfSegments(const unsigned int size);
37
38     const SegmentVector & GetSegments() const;
39     SegmentVector & GetSegments();
40     SmartPointer<Segment> GetSegment(const unsigned int idx = 0) const;
41
42     void AddSegment(SmartPointer<Segment> segment);
43
44     void SetSegments(SegmentVector & segments);
45
46 protected:
47     bool PrepareWrite();
48
49     SegmentVector Segments;
50 };
51
52 }
53
54 #endif // GDCMSEGMENTWRITER_H

```

## 11.411 gdcmSerieHelper.h File Reference

```

#include "gdcmTag.h"
#include "gdcmSmartPointer.h"
#include "gdcmFile.h"
#include <vector>
#include <string>
#include <map>

```

Include dependency graph for gdcmSerieHelper.h:

## Classes

- class [gdcm::FileWithName](#)  
*FileWithName.*
- class [gdcm::SerieHelper](#)  
*SerieHelper DO NOT USE this class, it is only a temporary solution for ITK migration from GDCM 1.x to GDCM 2.x It will disappear soon, you've been warned.*

## Namespaces

- namespace [gdcm](#)

## Typedefs

- typedef `bool(* gdcm::BOOL\_FUNCTION\_PFILE\_PFILE\_POINTER) (File *, File *)`
- typedef `std::vector< SmartPointer< FileWithName > > gdcm::FileList`

## Enumerations

- enum [gdcm::CompOperators](#) {  
[gdcm::GDCM\\_EQUAL](#) = 0 ,  
[gdcm::GDCM\\_DIFFERENT](#) ,  
[gdcm::GDCM\\_GREATER](#) ,  
[gdcm::GDCM\\_GREATEROREQUAL](#) ,  
[gdcm::GDCM\\_LESS](#) ,  
[gdcm::GDCM\\_LESSEQUAL](#) }
- enum [gdcm::LodModeType](#) {  
[gdcm::LD\\_ALL](#) = 0x00000000 ,  
[gdcm::LD\\_NOSEQ](#) = 0x00000001 ,  
[gdcm::LD\\_NOSHADOW](#) = 0x00000002 ,  
[gdcm::LD\\_NOSHADOWSEQ](#) = 0x00000004 }

## 11.412 gdcmSerieHelper.h

[Go to the documentation of this file.](#)

```

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4
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSERIEHELPER_H
15 #define GDCMSERIEHELPER_H
16
17 #include "gdcmTag.h"
18 #include "gdcmSmartPointer.h"

```

```

19 #include "gdcmFile.h"
20 #include <vector>
21 #include <string>
22 #include <map>
23
24 namespace gdcm
25 {
26
27 enum CompOperators {
28     GDCM_EQUAL = 0,
29     GDCM_DIFFERENT,
30     GDCM_GREATER,
31     GDCM_GREATEROREQUAL,
32     GDCM_LESS,
33     GDCM_LESSOREQUAL
34 };
35 enum LodModeType
36 {
37     LD_ALL          = 0x00000000,
38     LD_NOSEQ       = 0x00000001,
39     LD_NOSHADOW    = 0x00000002,
40     LD_NOSHADOWSEQ = 0x00000004
41 };
42
43
44 class GDCM_EXPORT FileWithName : public File
45 {
46 public:
47     FileWithName(File &f):File(f),filename(){}
48     std::string filename;
49 };
50
51 typedef std::vector<SmartPointer<FileWithName> > FileList;
52 typedef bool (*BOOL_FUNCTION_PFILE_PFILE_POINTER)(File *, File *);
53 class Scanner;
54
55 class GDCM_EXPORT SerieHelper
56 {
57 public:
58     SerieHelper();
59     ~SerieHelper();
60
61     void Clear();
62     void SetLoadMode (int ) {}
63     void SetDirectory(std::string const &dir, bool recursive=false);
64
65     void AddRestriction(const std::string &tag);
66     void SetUseSeriesDetails( bool useSeriesDetails );
67     void CreateDefaultUniqueSeriesIdentifier();
68     FileList *GetFirstSingleSerieUIDFileSet();
69     FileList *GetNextSingleSerieUIDFileSet();
70     std::string CreateUniqueSeriesIdentifier( File * inFile );
71     void OrderFileList(FileList *fileSet);
72     void AddRestriction(uint16_t group, uint16_t elem, std::string const &value, int op);
73
74 protected:
75     bool UserOrdering(FileList *fileSet);
76     void AddFileName(std::string const &filename);
77     bool AddFile(FileWithName &header);
78     void AddRestriction(const Tag& tag);
79     bool ImagePositionPatientOrdering(FileList *fileSet);
80     bool ImageNumberOrdering( FileList *fileList );
81     bool FileNameOrdering( FileList *fileList );
82
83     using Rule = struct RuleStructure{
84         uint16_t group;
85         uint16_t elem;
86         std::string value;
87         int op;
88     };
89     typedef std::vector<Rule> SerieRestrictions;
90
91     typedef std::map<std::string, FileList *> SingleSerieUIDFileSetmap;
92     SingleSerieUIDFileSetmap SingleSerieUIDFileSetHT;
93     SingleSerieUIDFileSetmap::iterator ItFileSetHT;
94
95 private:
96     SerieRestrictions Restrictions;
97     SerieRestrictions Refine;
98
99     bool UseSeriesDetails;

```

```

113     bool DirectOrder;
114
115     BOOL_FUNCTION_PFILE_PFILE_POINTER UserLessThanFunction;
116 };
117
118 // backward compat
119 } // end namespace gdcm
120
121
122 #endif //GDCMSERIEHELPER_H

```

## 11.413 gdcmSimpleSubjectWatcher.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmCommand.h"
#include "gdcmSmartPointer.h"
#include "gdcmAnonymizeEvent.h"
#include "gdcmDataEvent.h"

```

Include dependency graph for gdcmSimpleSubjectWatcher.h:

### Classes

- class [gdcm::SimpleSubjectWatcher](#)  
*SimpleSubjectWatcher.*

### Namespaces

- namespace [gdcm](#)

## 11.414 gdcmSimpleSubjectWatcher.h

[Go to the documentation of this file.](#)

```

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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSIMPLESUBJECTWATCHER_H
15 #define GDCMSIMPLESUBJECTWATCHER_H
16
17 #include "gdcmSubject.h"
18 #include "gdcmCommand.h"
19 #include "gdcmSmartPointer.h"
20 #include "gdcmAnonymizeEvent.h"
21 #include "gdcmDataEvent.h"
22
23 namespace gdcm
24 {
25 //-----

```

```

26 class Event;
31 class GDCM_EXPORT SimpleSubjectWatcher
32 {
33 public:
34     SimpleSubjectWatcher(Subject * s, const char *comment = "");
35     virtual ~SimpleSubjectWatcher();
36     SimpleSubjectWatcher(const SimpleSubjectWatcher&) = delete;
37     void operator=(const SimpleSubjectWatcher&) = delete;
38
39 protected:
40     virtual void StartFilter();
41     virtual void EndFilter();
42     virtual void ShowProgress(Subject *caller, const Event &evt);
43     virtual void ShowFileName(Subject *caller, const Event &evt);
44     virtual void ShowIteration();
45     virtual void ShowAnonymization(Subject *caller, const Event &evt);
46     virtual void ShowDataSet(Subject *caller, const Event &evt);
47     virtual void ShowData(Subject *caller, const Event &evt);
48     virtual void ShowAbort();
49
50 protected:
51     // Custom API used for internal Testing do not use !
52     void TestAbortOn();
53     void TestAbortOff();
54
55 private:
56     SmartPointer<Subject> m_Subject;
57     std::string m_Comment;
58
59     typedef SimpleMemberCommand<SimpleSubjectWatcher> SimpleCommandType;
60     typedef MemberCommand<SimpleSubjectWatcher> CommandType;
61
62     SmartPointer<SimpleCommandType> m_StartFilterCommand;
63     SmartPointer<SimpleCommandType> m_EndFilterCommand;
64     SmartPointer<CommandType> m_ProgressFilterCommand;
65     SmartPointer<CommandType> m_FileNameFilterCommand;
66     SmartPointer<SimpleCommandType> m_IterationFilterCommand;
67     SmartPointer<SimpleCommandType> m_AbortFilterCommand;
68     SmartPointer<CommandType> m_AnonymizeFilterCommand;
69     SmartPointer<CommandType> m_DataFilterCommand;
70     SmartPointer<CommandType> m_DataSetFilterCommand;
71
72     unsigned long m_StartTag;
73     unsigned long m_EndTag;
74     unsigned long m_ProgressTag;
75     unsigned long m_FileNameTag;
76     unsigned long m_IterationTag;
77     unsigned long m_AbortTag;
78     unsigned long m_AnonymizeTag;
79     unsigned long m_DataTag;
80     unsigned long m_DataSetTag;
81
82     bool m_TestAbort;
83
84 };
85 } // end namespace gdcms
86 //-----
87 #endif //GDCMSIMPLESUBJECTWATCHER_H

```

## 11.415 gdcmsorter.h File Reference

```

#include "gdcmsorter.h"
#include "gdcmsorter.h"
#include <vector>
#include <string>
#include <map>
#include <set>

```

Include dependency graph for gdcmsorter.h: This graph shows which files directly or indirectly include this file:



## Classes

- class [gdcm::Sorter](#)  
*Sorter.*

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const Sorter &s)

## 11.416 gdcmSorter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 #ifndef GDCMSORTER_H
15 #define GDCMSORTER_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmTag.h"
19
20 #include <vector>
21 #include <string>
22 #include <map>
23 #include <set>
24
25 namespace gdcm
26 {
27   class DataSet;
28
29   class GDCM_EXPORT Sorter
30   {
31   friend std::ostream& operator<<(std::ostream &_os, const Sorter &s);
32   public:
33     Sorter();
34     virtual ~Sorter();
35
36     virtual bool Sort(std::vector<std::string> const & filenames);
37
38     const std::vector<std::string> &GetFileNames()const { return FileNames; }
39
40     void Print(std::ostream &os) const;
41
42     bool AddSelect( Tag const &tag, const char *value );
43
44     void SetTagsToRead( std::set<Tag> const & tags );
45
46     typedef bool (*SortFunction)(DataSet const &, DataSet const &);
47     void SetSortFunction( SortFunction f );
48
49     virtual bool StableSort(std::vector<std::string> const & filenames);

```

```

69
70 protected:
71     std::vector<std::string> Filenames;
72     typedef std::map<Tag, std::string> SelectionMap;
73     std::map<Tag, std::string> Selection;
74     SortFunction SortFunc;
75     std::set<Tag> TagsToRead;
76 };
77 //-----
78 inline std::ostream& operator<<(std::ostream &os, const Sorter &s)
79 {
80     s.Print( os );
81     return os;
82 }
83
84
85 } // end namespace gdcms
86
87 #endif //GDCMSORTER_H

```

## 11.417 gdcmspacing.h File Reference

```

#include "gdcmtypes.h"
#include "gdcmsattribute.h"
Include dependency graph for gdcmspacing.h:

```

### Classes

- class [gdcms::Spacing](#)  
Class for *Spacing*.

### Namespaces

- namespace [gdcms](#)

## 11.418 gdcmspacing.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSPACING_H
15 #define GDCMSPACING_H
16
17 #include "gdcmtypes.h"
18 #include "gdcmsattribute.h"
19
20 namespace gdcms
21 {

```

```

85 class GDCM_EXPORT Spacing
86 {
87 public :
88     Spacing();
89     ~Spacing();
90
91     // Here are the list of spacing we support:
92     // (0018,0088) DS [1.500000]           # 8,1 Spacing Between Slices
93     // (0018,1164) DS [0.5\0.5 ]          # 8,2 Imager Pixel Spacing
94     // (0018,2010) DS [0.664062\0.664062 ] # 18,2 Nominal Scanned Pixel Spacing
95     // (0018,7022) DS [0.125\0.125 ]      # 12,2 Detector Element Spacing
96     // (0028,0030) DS [0.25\0.25 ]        # 10,2 Pixel Spacing
97     // > (0028,0a02) CS [FIDUCIAL]         # 8,1 Pixel Spacing Calibration Type
98     // > (0028,0a04) LO [Used fiducial ]   # 14,1 Pixel Spacing Calibration
99     // Description
100     // (0028,0034) IS [4\3 ]               # 4,2 Pixel Aspect Ratio
101     // (3002,0011) DS [0.8\0.8 ]          # 8,2 Image Plane Pixel Spacing
102
103     // Here is the list of Spacing we do not support:
104     // <entry group="0018" element="7041" vr="LT" vm="1" name="Grid Spacing Material"/>
105     // <entry group="0018" element="9030" vr="FD" vm="1" name="Tag Spacing First Dimension"/>
106     // <entry group="0018" element="9218" vr="FD" vm="1" name="Tag Spacing Second Dimension"/>
107     // <entry group="0018" element="9322" vr="FD" vm="2" name="Reconstruction Pixel Spacing"/>
108     // <entry group="0018" element="9404" vr="FL" vm="2" name="Object Pixel Spacing in Center of Beam"/>
109     // <entry group="0040" element="08d8" vr="SQ" vm="1" name="Pixel Spacing Sequence"/>
110     // <entry group="0070" element="0101" vr="DS" vm="2" name="Presentation Pixel Spacing"/>
111     // <entry group="2010" element="0376" vr="DS" vm="2" name="Printer Pixel Spacing"/>
112     // <entry group="300a" element="00e9" vr="DS" vm="2" name="Compensator Pixel Spacing"/>
113
114     typedef enum {
115         DETECTOR = 0, // (0018,1164) Imager Pixel Spacing
116         MAGNIFIED,    // (0018,1114) (IHE Mammo)
117         CALIBRATED,   // (0028,0030) Pixel Spacing -> (0028,0a04) Pixel Spacing Calibration Description
118         UNKNOWN
119     } SpacingType;
120
121     static Attribute<0x28,0x34> ComputePixelAspectRatioFromPixelSpacing(const Attribute<0x28,0x30>&
122     pixelspacing);
123 };
124 } // end namespace gdcm
125 //-----
126 #endif //GDCMSPACING_H

```

## 11.419 gdcmSpectroscopy.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmSpectroscopy.h:

### Classes

- class [gdcm::Spectroscopy](#)  
*Spectroscopy* class.

### Namespaces

- namespace [gdcm](#)

## 11.420 gdcmSpectroscopy.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSPECTROSCOPY_H
15 #define GDCMSPECTROSCOPY_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT Spectroscopy
22     {
23     public:
24         Spectroscopy() = default;
25     private:
26     };
27 } // end namespace gdcm
28
29 #endif //GDCMSPECTROSCOPY_H

```

## 11.421 gdcmSplitMosaicFilter.h File Reference

```

#include "gdcmFile.h"
#include "gdcmImage.h"

```

Include dependency graph for gdcmSplitMosaicFilter.h:

### Classes

- class [gdcm::SplitMosaicFilter](#)  
*SplitMosaicFilter* class.

### Namespaces

- namespace [gdcm](#)

## 11.422 gdcmSplitMosaicFilter.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSPLITMOSAICFILTER_H
15 #define GDCMSPLITMOSAICFILTER_H
16
17 #include "gdcmFile.h"
18 #include "gdcmImage.h"
19
20 namespace gdcm
21 {
22
23  /*
24  * Everything done in this code is for the sole purpose of writing interoperable
25  * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
26  * If you believe anything in this code violates any law or any of your rights,
27  * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
28  * find a solution.
29  */
30
31  class GDCM_EXPORT SplitMosaicFilter
32  {
33  public:
34      SplitMosaicFilter();
35      ~SplitMosaicFilter();
36
37      bool Split();
38
39      bool ComputeMOSAICDimensions(unsigned int dims[3]);
40
41      bool ComputeMOSAICSliceNormal( double dims[3], bool & inverted );
42
43      bool ComputeMOSAICSlicePosition( double pos[3], bool inverted );
44
45      void SetImage(const Image& image);
46      const Image &GetImage()const { return *I; }
47      Image &GetImage() { return *I; }
48
49      void SetFile(const File& f) { F = f; }
50      File &GetFile() { return *F; }
51      const File &GetFile()const { return *F; }
52
53      static bool GetAcquisitionSize(unsigned int size[2], DataSet const & ds);
54      static unsigned int GetNumberOfImagesInMosaic( File const & file );
55
56  protected:
57
58  private:
59      SmartPointer<File> F;
60      SmartPointer<Image> I;
61  };
62
63  } // end namespace gdcm
64
65 #endif //GDCMSPLITMOSAICFILTER_H

```

## 11.423 gdcmStreamImageReader.h File Reference

```
#include "gdcmReader.h"
```

Include dependency graph for gdcmStreamImageReader.h:

## Classes

- class `gdcm::StreamImageReader`  
*StreamImageReader.*

## Namespaces

- namespace `gdcm`

## 11.424 gdcmStreamImageReader.h

[Go to the documentation of this file.](#)

```

1  /*=====
2  *
3  *   Copyright NumFOCUS
4  *
5  *   Licensed under the Apache License, Version 2.0 (the "License");
6  *   you may not use this file except in compliance with the License.
7  *   You may obtain a copy of the License at
8  *
9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMSTREAMIMAGEREADER_H
19 #define GDCMSTREAMIMAGEREADER_H
20
21 #include "gdcmReader.h"
22
23 namespace gdcm
24 {
25
26 class MediaStorage;
27 class GDCM_EXPORT StreamImageReader
28 {
29 {
30
31 public:
32     StreamImageReader();
33     virtual ~StreamImageReader();
34
35     void SetFileName(const char* inFileName);
36     void SetStream(std::istream& inStream);
37
38     std::vector<unsigned int> GetDimensionsValueForResolution( unsigned int );
39
40     void DefinePixelExtent( uint16_t inXMin, uint16_t inXMax,
41         uint16_t inYMin, uint16_t inYMax, uint16_t inZMin = 0, uint16_t inZMax = 1);
42
43     uint32_t DefineProperBufferLength() const;
44
45     bool Read(char* inReadBuffer, const std::size_t& inBufferLength);
46
47     bool CanReadImage() const;
48
49     virtual bool ReadImageInformation();
50
51     File const & GetFile() const;
52
53 protected:
54 private:
55     //contains a reader for being able to ReadUpToTag
56     //however, we don't want the user to be able to call Read
57     //either directly or via a parent class call, so we hide the reader in here.
58     Reader mReader;
59

```

```

101
102  std::streamoff mFileOffset; //the file offset for getting header information
103  #if 0
104  std::streamoff mFileOffset1;
105  #endif
106  DataSet mHeaderInformation; //all the non-pixel information
107
108  //for thread safety, these should not be stored here, but should be used
109  //for every read subregion operation.
110  uint16_t mXMin, mYMin, mXMax, mYMax, mZMin, mZMax;
111
112  bool ReadImageSubregionRAW(char* inReadBuffer, const std::size_t& inBufferLength);
113
114  bool ReadImageSubregionJpegLS(char* inReadBuffer, const std::size_t& inBufferLength);
115  };
116
117 } // end namespace gdcm
118
119 #endif //GDCMSTREAMIMAGEREADER_H
120
121

```

## 11.425 gdcmStreamImageWriter.h File Reference

```

#include "gdcmWriter.h"
#include <iostream>
#include "gdcmDataSet.h"

```

Include dependency graph for gdcmStreamImageWriter.h:

### Classes

- class [gdcm::StreamImageWriter](#)  
*StreamImageReader.*

### Namespaces

- namespace [gdcm](#)

## 11.426 gdcmStreamImageWriter.h

[Go to the documentation of this file.](#)

```

1  /*=====
2  *
3  *   Copyright NumFOCUS
4  *
5  *   Licensed under the Apache License, Version 2.0 (the "License");
6  *   you may not use this file except in compliance with the License.
7  *   You may obtain a copy of the License at
8  *
9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17  *=====*/
18

```

```

19 #ifndef GDCMSTREAMIMAGEWRITER_H
20 #define GDCMSTREAMIMAGEWRITER_H
21
22 #include "gdcmWriter.h"
23 #include <iostream>
24 #include "gdcmDataSet.h"
25
26 namespace gdcm
27 {
28
29 class MediaStorage;
30 class RAWCodec;
42 class GDCM_EXPORT StreamImageWriter
43 {
44
45 public:
46     StreamImageWriter();
47     virtual ~StreamImageWriter();
48
49
53     void SetFileName(const char* inFileName);
54     void SetStream(std::ostream& inStream);
55
64     void DefinePixelExtent(uint16_t inXMin, uint16_t inXMax,
65         uint16_t inYMin, uint16_t inYMax, uint16_t inZMin = 0, uint16_t inZMax = 1);
66
67
73     uint32_t DefineProperBufferLength();
74
82     bool Write(void* inWriteBuffer, const std::size_t& inBufferLength);
83
87     virtual bool WriteImageInformation();
88
92     bool CanWriteFile() const;
93
94
97     void SetFile(const File& inFile);
98
99 protected:
100
101     //contains the PrepareWrite function, which will get the given dataset ready
102     //for writing to disk by manufacturing the header information.
103     //note that if there is a pixel element in the given dataset, that will be removed
104     //during the copy, so that the imagewriter can write everything else out
105     Writer mWriter;
106
107     //is the offset necessary if we always append?
108     //std::streamoff mFileOffset; //the fileoffset for getting header information
109     SmartPointer<File> mspFile; //all the non-pixel information
110
111     //for thread safety, these should not be stored here, but should be used
112     //for every read subregion operation.
113     uint16_t mXMin, mYMin, mXMax, mYMax, mZMin, mZMax;
114
119     //virtual bool ReadImageSubregionRAW(std::ostream& os);
120     virtual bool WriteImageSubregionRAW(char* inWriteBuffer, const std::size_t& inBufferLength);
121
131     int WriteRawHeader(RAWCodec* inCodec, std::ostream* inStream);
132
137     int mElementOffsets;
138     int mElementOffsets1;
139
140 };
141
142 } // end namespace gdcm
143
144 #endif //GDCMSTREAMIMAGEWRITER_H

```

## 11.427 gdcmStrictScanner.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"

```



```
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include <map>
#include <set>
#include <string>
#include <string.h>
Include dependency graph for gdcmStrictScanner.h:
```

## Classes

- struct [gdcm::StrictScanner::Itstr](#)
- class [gdcm::StrictScanner](#)  
*StrictScanner.*

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const StrictScanner &s)

## 11.428 gdcmStrictScanner.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSTRICTSCANNER_H
15 #define GDCMSTRICTSCANNER_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmSubject.h"
19 #include "gdcmTag.h"
20 #include "gdcmPrivateTag.h"
21 #include "gdcmSmartPointer.h"
22
23 #include <map>
24 #include <set>
25 #include <string>
26
27 #include <string.h> // strcmp
28
29 namespace gdcm
30 {
31 class StringFilter;
32
33 class GDCM_EXPORT StrictScanner : public Subject
```

```

56 {
57     friend std::ostream& operator<<(std::ostream &_os, const StrictScanner &s);
58 public:
59     StrictScanner():Values(),FileNames(),Mappings() {}
60     ~StrictScanner() override;
61
62     typedef std::map<Tag, const char*> TagToValue;
63     //typedef std::map<Tag, ConstCharWrapper> TagToValue; //StringMap;
64     //typedef TagToStringMap TagToValue;
65     typedef TagToValue::value_type TagToValueValueType;
66
67     void AddTag( Tag const & t );
68     void ClearTags();
69
70     // Work in progress do not use:
71     void AddPrivateTag( PrivateTag const & t );
72
73     void AddSkipTag( Tag const & t );
74     void ClearSkipTags();
75
76     bool Scan( Directory::FileNamesType const & filenames );
77
78     Directory::FileNamesType const &GetFileNames()const { return FileNames; }
79
80     void Print( std::ostream & os ) const override;
81
82     void PrintTable( std::ostream & os ) const;
83
84     bool IsKey( const char * filename ) const;
85
86     Directory::FileNamesType GetKeys() const;
87
88     // struct to store all the values found:
89     typedef std::set< std::string > ValueType;
90
91     ValueType const & GetValues()const { return Values; }
92
93     ValueType GetValues(Tag const &t) const;
94
95     Directory::FileNamesType GetOrderedValues(Tag const &t) const;
96
97     /* ltstr is CRITICAL, otherwise pointers value are used to do the key comparison */
98     struct ltstr
99     {
100         bool operator()(const char* s1, const char* s2)const
101     {
102         assert( s1 && s2 );
103         return strcmp(s1, s2) < 0;
104     }
105     };
106     typedef std::map<const char *,TagToValue, ltstr> MappingType;
107     typedef MappingType::const_iterator ConstIterator;
108     ConstIterator Begin()const { return Mappings.begin(); }
109     ConstIterator End()const { return Mappings.end(); }
110
111     MappingType const & GetMappings()const { return Mappings; }
112
113     TagToValue const & GetMapping(const char *filename) const;
114
115     const char *GetFilenameFromTagToValue(Tag const &t, const char *valueref) const;
116
117     Directory::FileNamesType GetAllFileNamesFromTagToValue(Tag const &t, const char *valueref) const;
118
119     // by a call to GetMapping()
120     TagToValue const & GetMappingFromTagToValue(Tag const &t, const char *value) const;
121
122     const char* GetValue(const char *filename, Tag const &t) const;
123
124     static SmartPointer<StrictScanner> New() { return new StrictScanner; }
125
126 protected:
127     void ProcessPublicTag(StringFilter &sf, const char *filename);
128 private:
129     // struct to store all uniq tags in ascending order:
130     typedef std::set< Tag > TagsType;
131     typedef std::set< PrivateTag > PrivateTagsType;
132     std::set< Tag > Tags;
133     std::set< PrivateTag > PrivateTags;
134     std::set< Tag > SkipTags;
135     ValueType Values;
136     Directory::FileNamesType FileNames;

```

```

170
171 // Main struct that will hold all mapping:
172 MappingType Mappings;
173
174 double Progress;
175 };
176 //-----
177 inline std::ostream& operator<<(std::ostream &os, const StrictScanner &s)
178 {
179     s.Print( os );
180     return os;
181 }
182
183 } // end namespace gdcm
184
185 #endif //GDCMSTRICTSCANNER_H

```

## 11.429 gdcmStrictScanner2.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmPrivateTag.h"
#include "gdcmSmartPointer.h"
#include "gdcmSubject.h"
#include "gdcmTag.h"
#include <map>
#include <set>
#include <string>
#include <string.h>

```

Include dependency graph for gdcmStrictScanner2.h:

### Classes

- struct [gdcm::StrictScanner2::ltstr](#)
- class [gdcm::StrictScanner2](#)  
*StrictScanner2.*

### Namespaces

- namespace [gdcm](#)

### Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const StrictScanner2 &s)

## 11.430 gdcmStrictScanner2.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSTRICTSCANNER2_H
15 #define GDCMSTRICTSCANNER2_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmPrivateTag.h"
19 #include "gdcmSmartPointer.h"
20 #include "gdcmSubject.h"
21 #include "gdcmTag.h"
22
23 #include <map>
24 #include <set>
25 #include <string>
26
27 #include <string.h> // strcmp
28
29 namespace gdcm {
30 class StringFilter;
31
32 class GDCM_EXPORT StrictScanner2 : public Subject {
33     friend std::ostream &operator<<(std::ostream &_os, const StrictScanner2 &s);
34
35 public:
36     StrictScanner2() : Values(), Filenames(), PublicMappings(), PrivateMappings() {}
37     ~StrictScanner2() override;
38
39     typedef std::map<Tag, const char *> PublicTagToValue;
40     typedef PublicTagToValue::value_type PublicTagToValueValueType;
41
42     typedef std::map<PrivateTag, const char *> PrivateTagToValue;
43     typedef PrivateTagToValue::value_type PrivateTagToValueValueType;
44
45     bool AddPublicTag(Tag const &t);
46     void ClearPublicTags();
47
48     // Work in progress do not use:
49     bool AddPrivateTag(PrivateTag const &pt);
50     void ClearPrivateTags();
51
52     bool AddSkipTag(Tag const &t);
53     void ClearSkipTags();
54
55     bool Scan(Directory::FileNamesType const &filenames);
56
57     Directory::FileNamesType const &GetFilenames()const { return Filenames; }
58
59     void Print(std::ostream &os) const override;
60
61     void PrintTable(std::ostream &os, bool header = false) const;
62
63     bool IsKey(const char *filename) const;
64
65     Directory::FileNamesType GetKeys() const;
66
67     // struct to store all the values found:
68     typedef std::set<std::string> ValueType;
69
70     ValueType const &GetValues()const { return Values; }
71
72     ValueType GetPublicValues(Tag const &t) const;
73
74     ValueType GetPrivateValues(PrivateTag const &pt) const;
75
76     Directory::FileNamesType GetPublicOrderedValues(Tag const &t) const;

```

```

121
122     Directory::FileNamesType GetPrivateOrderedValues(PublicTag const &pt) const;
123
124     /* ltstr is CRITICAL, otherwise pointers value are used to do the key
125     * comparison */
126     struct ltstr {
127         bool operator()(const char *s1, const char *s2) const {
128             assert(s1 && s2);
129             return strcmp(s1, s2) < 0;
130         }
131     };
132     typedef std::map<const char *, PublicTagToValue, ltstr> PublicMappingType;
133     typedef PublicMappingType::const_iterator PublicConstIterator;
134     PublicConstIterator Begin() const { return PublicMappings.begin(); }
135     PublicConstIterator End() const { return PublicMappings.end(); }
136
137     typedef std::map<const char *, PrivateTagToValue, ltstr> PrivateMappingType;
138     typedef PrivateMappingType::const_iterator PrivateConstIterator;
139     PrivateConstIterator PrivateBegin() const { return PrivateMappings.begin(); }
140     PrivateConstIterator PrivateEnd() const { return PrivateMappings.end(); }
141
142     PublicMappingType const &GetPublicMappings() const { return PublicMappings; }
143     PrivateMappingType const &GetPrivateMappings() const {
144         return PrivateMappings;
145     }
146
147     PublicTagToValue const &GetPublicMapping(const char *filename) const;
148     PrivateTagToValue const &GetPrivateMapping(const char *filename) const;
149
150     const char *GetFilenameFromPublicTagToValue(Tag const &t,
151         const char *valueref) const;
152     const char *GetFilenameFromPrivateTagToValue(PrivateTag const &pt,
153         const char *valueref) const;
154
155     Directory::FileNamesType GetAllFileNamesFromPublicTagToValue(
156         Tag const &t, const char *valueref) const;
157     Directory::FileNamesType GetAllFileNamesFromPrivateTagToValue(
158         PrivateTag const &pt, const char *valueref) const;
159
160     // by a call to GetMapping()
161     PublicTagToValue const &GetMappingFromPublicTagToValue(
162         Tag const &t, const char *value) const;
163     PrivateTagToValue const &GetMappingFromPrivateTagToValue(
164         PrivateTag const &pt, const char *value) const;
165
166     const char *GetPublicValue(const char *filename, Tag const &t) const;
167     const char *GetPrivateValue(const char *filename, PrivateTag const &pt) const;
168
169     static SmartPointer<StrictScanner2> New() { return new StrictScanner2; }
170
171 protected:
172     void ProcessPublicTag(StringFilter &sf, const char *filename);
173     void ProcessPrivateTag(StringFilter &sf, const char *filename);
174
175 private:
176     // struct to store all uniq tags in ascending order:
177     typedef std::set<Tag> PublicTagsType;
178     typedef std::set<PrivateTag> PrivateTagsType;
179     std::set<Tag> PublicTags; // Public and Private Creator
180     std::set<PrivateTag> PrivateTags; // Only Private (no Private Creator)
181     std::set<Tag> SkipTags;
182     ValuesType Values;
183     Directory::FileNamesType Filenames;
184
185     // Main struct that will hold all public mapping:
186     PublicMappingType PublicMappings;
187     // Main struct that will hold all private mapping:
188     PrivateMappingType PrivateMappings;
189
190     double Progress;
191 };
192 //-----
193 inline std::ostream &operator<<(std::ostream &os, const StrictScanner2 &s) {
194     s.Print(os);
195     return os;
196 }
197
198 } // end namespace gdc
199
200 #endif // GDCMSTRICTSCANNER2_H

```

## 11.431 gdcmStringFilter.h File Reference

```
#include "gdcmDataElement.h"
#include "gdcmDicts.h"
#include "gdcmFile.h"
Include dependency graph for gdcmStringFilter.h:
```

### Classes

- class [gdcm::StringFilter](#)  
*StringFilter.*

### Namespaces

- namespace [gdcm](#)

## 11.432 gdcmStringFilter.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSTRINGFILTER_H
15 #define GDCMSTRINGFILTER_H
16
17 #include "gdcmDataElement.h"
18 #include "gdcmDicts.h"
19 #include "gdcmFile.h"
20
21 namespace gdcm
22 {
23
24
25
26
27
28
29 class GDCM_EXPORT StringFilter
30 {
31 public:
32     StringFilter();
33     ~StringFilter();
34
35
36     void UseDictAlways(bool) {}
37
38
39     void SetDicts(const Dicts &dicts);
40
41
42     std::string ToString(const DataElement& de) const;
43
44     std::string ToString(const Tag& t) const;
45
46     std::string ToString(const PrivateTag& t) const;
47
48     std::pair<std::string, std::string> ToStringPair(const DataElement& de) const;
49     std::pair<std::string, std::string> ToStringPair(const Tag& t) const;
50
51
52     std::string FromString(const Tag&t, const char * value, size_t len);
53
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59
60
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```

61
62 void SetFile(const File& f) { F = f; }
63 File &GetFile() { return *F; }
64 const File &GetFile()const { return *F; }
65
66
67 bool ExecuteQuery(std::string const &query, std::string &value) const;
68
69 protected:
70 std::pair<std::string, std::string> ToStringPair(const Tag& t, DataSet const &ds) const;
71 bool ExecuteQuery(std::string const &query, DataSet const &ds, std::string &value) const;
72
73 private:
74 std::pair<std::string, std::string> ToStringPairInternal(const DataElement& de, DataSet const &ds) const;
75 SmartPointer<File> F;
76 };
77
78 } // end namespace gdcm
79
80 #endif //GDCMSTRINGFILTER_H

```

## 11.433 gdcmSurface.h File Reference

```

#include <gdcmObject.h>
#include <gdcmDataElement.h>
#include <gdcmMeshPrimitive.h>
#include "gdcmSegmentHelper.h"

```

Include dependency graph for gdcmSurface.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::Surface](#)

*This class defines a SURFACE IE.*

### Namespaces

- namespace [gdcm](#)

## 11.434 gdcmSurface.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSURFACE_H
15 #define GDCMSURFACE_H
16
17 #include <gdcmObject.h>
18 #include <gdcmDataElement.h>

```

```

19 #include <gdcMeshPrimitive.h>
20 #include "gdcSegmentHelper.h" // for BasicCodedEntry
21
22 namespace gdcM
23 {
24
25 class GDCM_EXPORT Surface : public Object
26 {
27 public:
28
29     typedef enum {
30         NO = 0,
31         YES,
32         UNKNOWN,
33         STATES_END
34     } STATES;
35
36     static const char * GetSTATESString(STATES state);
37     static STATES GetSTATES(const char * state);
38
39     typedef enum {
40         SURFACE = 0,
41         WIREFRAME,
42         POINTS,
43         VIEWType_END
44     } VIEWType;
45
46     static const char * GetVIEWTypeString(VIEWType type);
47     static VIEWType GetVIEWType(const char * type);
48
49     Surface();
50
51     ~Surface() override;
52
53     /** Common getters/setters */
54     unsigned long GetSurfaceNumber() const;
55     void SetSurfaceNumber(const unsigned long nb);
56
57     const char * GetSurfaceComments() const;
58     void SetSurfaceComments(const char * comment);
59
60     bool GetSurfaceProcessing() const;
61     void SetSurfaceProcessing(bool b);
62
63     float GetSurfaceProcessingRatio() const;
64     void SetSurfaceProcessingRatio(const float ratio);
65
66     const char * GetSurfaceProcessingDescription() const;
67     void SetSurfaceProcessingDescription(const char * description);
68
69     SegmentHelper::BasicCodedEntry const & GetProcessingAlgorithm() const;
70     SegmentHelper::BasicCodedEntry & GetProcessingAlgorithm();
71     void SetProcessingAlgorithm(SegmentHelper::BasicCodedEntry const & BSE);
72
73     unsigned short GetRecommendedDisplayGrayscaleValue() const;
74     void SetRecommendedDisplayGrayscaleValue(const unsigned short vl);
75
76     const unsigned short * GetRecommendedDisplayCIELabValue() const;
77     unsigned short GetRecommendedDisplayCIELabValue(const unsigned int idx) const;
78     void SetRecommendedDisplayCIELabValue(const unsigned short vl[3]);
79     void SetRecommendedDisplayCIELabValue(const unsigned short vl, const unsigned int idx = 0);
80     void SetRecommendedDisplayCIELabValue(const std::vector< unsigned short > & vl);
81
82     float GetRecommendedPresentationOpacity() const;
83     void SetRecommendedPresentationOpacity(const float opacity);
84
85     VIEWType GetRecommendedPresentationType() const;
86     void SetRecommendedPresentationType(VIEWType type);
87
88     STATES GetFiniteVolume() const;
89     void SetFiniteVolume(STATES state);
90
91     STATES GetManifold() const;
92     void SetManifold(STATES state);
93
94     SegmentHelper::BasicCodedEntry const & GetAlgorithmFamily() const;
95     SegmentHelper::BasicCodedEntry & GetAlgorithmFamily();
96     void SetAlgorithmFamily(SegmentHelper::BasicCodedEntry const & BSE);
97
98     const char * GetAlgorithmVersion() const;
99     void SetAlgorithmVersion(const char * str);

```



```

111
112 const char * GetAlgorithmName() const;
113 void SetAlgorithmName(const char * str);
114
115 /** Points getters/setters */
116 unsigned long GetNumberOfSurfacePoints() const;
117 void SetNumberOfSurfacePoints(const unsigned long nb);
118
119 const DataElement & GetPointCoordinatesData() const;
120 DataElement & GetPointCoordinatesData();
121
122 void SetPointCoordinatesData(DataElement const & de);
123
124 const float * GetPointPositionAccuracy() const;
125 void SetPointPositionAccuracy(const float * accuracies);
126
127 float GetMeanPointDistance() const;
128 void SetMeanPointDistance(float average);
129
130 float GetMaximumPointDistance() const;
131 void SetMaximumPointDistance(float maximum);
132
133 const float * GetPointsBoundingBoxCoordinates() const;
134 void SetPointsBoundingBoxCoordinates(const float * coordinates);
135
136 const float * GetAxisOfRotation() const;
137 void SetAxisOfRotation(const float * axis);
138
139 const float * GetCenterOfRotation() const;
140 void SetCenterOfRotation(const float * center);
141
142 /** Vectors getters/setters */
143 unsigned long GetNumberOfVectors() const;
144 void SetNumberOfVectors(const unsigned long nb);
145
146 unsigned short GetVectorDimensionality() const;
147 void SetVectorDimensionality(const unsigned short dim);
148
149 const float * GetVectorAccuracy() const;
150 void SetVectorAccuracy(const float * accuracy);
151
152 const DataElement & GetVectorCoordinateData() const;
153 DataElement & GetVectorCoordinateData();
154
155 void SetVectorCoordinateData(DataElement const & de);
156
157 /** Primitive getters/setters */
158 MeshPrimitive const & GetMeshPrimitive() const;
159 MeshPrimitive & GetMeshPrimitive();
160
161 void SetMeshPrimitive(MeshPrimitive & mp);
162
163 private:
164
165 /** Common members */
166
167 //0066 0003 UL 1 Surface Number
168 unsigned long SurfaceNumber;
169 //0066 0004 LT 1 Surface Comments
170 std::string SurfaceComments;
171
172 //0066 0009 CS 1 Surface Processing
173 bool SurfaceProcessing;
174 //0066 000a FL 1 Surface Processing Ratio
175 float SurfaceProcessingRatio;
176 //0066 000b LO 1 Surface Processing Description
177 std::string SurfaceProcessingDescription;
178 // Processing Algorithm Code
179 SegmentHelper::BasicCodedEntry ProcessingAlgorithm;
180
181 //0062 000c US 1 Recommended Display Grayscale Value
182 unsigned short RecommendedDisplayGrayscaleValue;
183 //0062 000d US 3 Recommended Display CIELab Value
184 unsigned short RecommendedDisplayCIELabValue[3];
185
186 // 0066 000c FL 1 Recommended Presentation Opacity
187 float RecommendedPresentationOpacity;
188 // 0066 000d CS 1 Recommended Presentation Type
189 VIEWType RecommendedPresentationType;
190
191 //0066 000e CS 1 Finite Volume

```

```

204 STATES      FiniteVolume;
205 //0066 0010 CS 1 Manifold
206 STATES      Manifold;
207
208 // Algorithm Family Code
209 SegmentHelper::BasicCodedEntry AlgorithmFamily;
210
211 //0066 0031 LO 1 Algorithm Version
212 std::string  AlgorithmVersion;
213 //0066 0032 LT 1 Algorithm Parameters
214 //0066 0036 LO 1 Algorithm Name
215 std::string  AlgorithmName;
216
217
218 /**          Point members          **//
219
220 //0066 0015 UL 1 Number of Surface Points
221 unsigned long NumberOfSurfacePoints;
222 //0066 0016 OF 1 Point Coordinates Data
223 DataElement   PointCoordinatesData;
224 //0066 0017 FL 3 Point Position Accuracy
225 float *       PointPositionAccuracy;
226 //0066 0018 FL 1 Mean Point Distance
227 float         MeanPointDistance;
228 //0066 0019 FL 1 Maximum Point Distance
229 float         MaximumPointDistance;
230 //0066 001a FL 6 Points Bounding Box Coordinates
231 float *       PointsBoundingBoxCoordinates;
232 //0066 001b FL 3 Axis of Rotation
233 float *       AxisOfRotation;
234 //0066 001c FL 3 Center of Rotation
235 float *       CenterOfRotation;
236
237
238 /**          Normal members          **//
239
240 //0066 001e UL 1 Number of Vectors
241 unsigned long NumberOfVectors;
242 //0066 001f US 1 Vector Dimensionality
243 unsigned short VectorDimensionality;
244 //0066 0020 FL 1-n Vector Accuracy
245 float *       VectorAccuracy;
246 //0066 0021 OF 1 Vector Coordinate Data
247 DataElement   VectorCoordinateData;
248
249
250 /**          Primitive members          **//
251 SmartPointer< MeshPrimitive > Primitive;
252 };
253
254 }
255
256 #endif // GDCMSURFACE_H

```

## 11.435 gdcmSurfaceHelper.h File Reference

```

#include "gdcmTypes.h"
#include <vector>
#include <iostream>

```

Include dependency graph for gdcmSurfaceHelper.h:

### Classes

- class [gdcm::SurfaceHelper](#)  
*SurfaceHelper.*

## Namespaces

- namespace [gdcm](#)

## 11.436 gdcmSurfaceHelper.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSURFACEHELPER_H
15 #define GDCMSURFACEHELPER_H
16
17 #include "gdcmTypes.h" // for GDCM_EXPORT
18
19 #include <vector>
20 #include <iostream>
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT SurfaceHelper
26 {
27 public:
28
29     typedef std::vector< unsigned short > ColorArray;
30
31     template <typename T, typename U>
32     static unsigned short RGBToRecommendedDisplayGrayscale(const std::vector<T> & RGB,
33                                                             const U rangeMax = 255);
34
35     template <typename T, typename U>
36     static ColorArray RGBToRecommendedDisplayCIELab(const std::vector<T> & RGB,
37                                                      const U rangeMax = 255);
38
39     template <typename T, typename U>
40     static std::vector<T> RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
41                                                         const U rangeMax = 255);
42
43     template <typename U>
44     static std::vector<float> RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
45                                                            const U rangeMax = 255);
46
47 private:
48
49     static std::vector< float > RGBToXYZ(const std::vector<float> & RGB);
50
51     static std::vector< float > XYZToRGB(const std::vector<float> & XYZ);
52
53     static std::vector< float > XYZToCIELab(const std::vector<float> & XYZ);
54
55     static std::vector< float > CIELabToXYZ(const std::vector<float> & CIELab);
56 };
57
58 template <typename T, typename U>
59 unsigned short SurfaceHelper::RGBToRecommendedDisplayGrayscale(const std::vector<T> & RGB,
60                                                                const U rangeMax/* = 255*/)
61 {
62     assert(RGB.size() > 2);
63
64     unsigned short Grayscale = 0;
65
66     const float inverseRangeMax = 1.0f / (float) rangeMax;
67
68     // 0xFFFF == 255 == white
69     Grayscale = (unsigned short) ((0.2989 * RGB[0] + 0.5870 * RGB[1] + 0.1140 * RGB[2])
70                                 * inverseRangeMax // Convert to range 0-1

```

```

115             * 0xFFFF);           // Convert to range 0x0000-0xFFFF
116
117     return Grayscale;
118 }
119
120 template <typename T, typename U>
121 SurfaceHelper::ColorArray SurfaceHelper::RGBToRecommendedDisplayCIELab(const std::vector<T> & RGB,
122                               const U rangeMax/* = 255*/)
123 {
124     assert(RGB.size() > 2);
125
126     ColorArray CIELab(3);
127     std::vector<float> tmp(3);
128
129     // Convert to range 0-1
130     const float inverseRangeMax = 1.0f / (float) rangeMax;
131     tmp[0] = (float) (RGB[0] * inverseRangeMax);
132     tmp[1] = (float) (RGB[1] * inverseRangeMax);
133     tmp[2] = (float) (RGB[2] * inverseRangeMax);
134
135     tmp = SurfaceHelper::XYZToCIELab( SurfaceHelper::RGBToXYZ( tmp ) );
136
137     // Convert to range 0x0000-0xFFFF
138     // 0xFFFF "=" 127, 0x8080 "=" 0, 0x0000 "=" -128
139     CIELab[0] = (unsigned short) ( 0xFFFF * (tmp[0]*0.01f));
140     if(tmp[1] >= -128 && tmp[1] <= 0)
141     {
142         CIELab[1] = (unsigned short) (((float) (0x8080)/128.0f)*tmp[1] + ((float)0x8080));
143     }
144     else if(tmp[1] <= 127 && tmp[1] > 0)
145     {
146         CIELab[1] = (unsigned short) (((float) (0xFFFF - 0x8080)/127.0f)*tmp[1] + (float) (0x8080));
147     }
148     if(tmp[2] >= -128 && tmp[2] <= 0)
149     {
150         CIELab[2] = (unsigned short) (((float)0x8080/128.0f)*tmp[2] + ((float)0x8080));
151     }
152     else if(tmp[2] <= 127 && tmp[2] > 0)
153     {
154         CIELab[2] = (unsigned short) (((float) (0xFFFF - 0x8080)/127.0f)*tmp[2] + (float) (0x8080));
155     }
156
157     return CIELab;
158 }
159
160 template <typename T, typename U>
161 std::vector<T> SurfaceHelper::RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
162                               const U rangeMax/* = 255*/)
163 {
164     assert(CIELab.size() > 2);
165
166     std::vector<T> RGB(3);
167     std::vector<float> tmp(3);
168
169     // Convert to range 0-1
170
171     tmp[0] = 100.0f*CIELab[0] / (float) (0xFFFF);
172     if(CIELab[1] <= 0x8080)
173     {
174         tmp[1] = (float) ((CIELab[1] - 0x8080) * 128.0f) / (float) 0x8080;
175     }
176     else
177     {
178         tmp[1] = (float) ((CIELab[1]-0x8080)*127.0f / (float) (0xFFFF - 0x8080));
179     }
180     if(CIELab[2] <= 0x8080)
181     {
182         tmp[2] = (float) ((CIELab[2] - 0x8080) * 128.0f) / (float) 0x8080;
183     }
184     else
185     {
186         tmp[2] = (float) ((CIELab[2]-0x8080)*127.0f / (float) (0xFFFF - 0x8080));
187     }
188
189     tmp = SurfaceHelper::XYZToRGB( SurfaceHelper::CIELabToXYZ( tmp ) );
190
191     // Convert to range 0-rangeMax
192     RGB[0] = (T) (tmp[0] * rangeMax);
193     RGB[1] = (T) (tmp[1] * rangeMax);
194     RGB[2] = (T) (tmp[2] * rangeMax);
195

```

```

196     return RGB;
197 }
198
199 template <typename U>
200 std::vector<float> SurfaceHelper::RecommendedDisplayCIELabToRGB(const ColorArray & CIELab,
201                                                                const U rangeMax/* = 255*/)
202 {
203     return RecommendedDisplayCIELabToRGB<float>(CIELab, rangeMax);
204 }
205
206 } // end namespace gdcm
207
208 #endif // GDCMSURFACEHELPER_H

```

## 11.437 gdcmSurfaceReader.h File Reference

```

#include <gdcmSegmentReader.h>
#include <gdcmSurface.h>

```

Include dependency graph for gdcmSurfaceReader.h:

### Classes

- class [gdcm::SurfaceReader](#)  
*This class defines a SURFACE IE reader.*

### Namespaces

- namespace [gdcm](#)

## 11.438 gdcmSurfaceReader.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSURFACEREADER_H
15 #define GDCMSURFACEREADER_H
16
17 #include <gdcmSegmentReader.h>
18 #include <gdcmSurface.h>
19
20 namespace gdcm
21 {
22
23     class GDCM_EXPORT SurfaceReader : public SegmentReader
24     {
25     public:
26         SurfaceReader();
27
28     };
29
30 }

```

```

34     ~SurfaceReader() override;
35
36     bool Read() override;
37
38     unsigned long GetNumberOfSurfaces() const;
39
40 protected:
41
42     bool ReadSurfaces();
43
44     bool ReadSurface(const Item & surfaceItem, const unsigned long idx);
45
46     bool ReadPointMacro(SmartPointer< Surface > surface, const DataSet & surfaceDS);
47 };
48
49
50 }
51
52 #endif // GDCMSURFACEREADER_H

```

## 11.439 gdcmSurfaceWriter.h File Reference

```
#include <gdcmSegmentWriter.h>
```

```
#include <gdcmSurface.h>
```

Include dependency graph for gdcmSurfaceWriter.h:

### Classes

- class [gdcm::SurfaceWriter](#)

*This class defines a SURFACE IE writer.*

### Namespaces

- namespace [gdcm](#)

## 11.440 gdcmSurfaceWriter.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSURFACEWRITER_H
15 #define GDCMSURFACEWRITER_H
16
17 #include <gdcmSegmentWriter.h>
18 #include <gdcmSurface.h>
19
20 namespace gdcm
21 {
22

```

```

29 class GDCM_EXPORT SurfaceWriter : public SegmentWriter
30 {
31 public:
32     SurfaceWriter();
33
34     ~SurfaceWriter() override;
35
36     // const Surface & GetSurface() const { return *SurfaceData; }
37     // Surface & GetSurface() { return *SurfaceData; }
38     // void SetSurface(Surface const & segment);
39
40     bool Write() override; // Execute()
41
42     unsigned long GetNumberOfSurfaces();
43     void SetNumberOfSurfaces(const unsigned long nb);
44
45 protected:
46
47     bool PrepareWrite();
48
49     void ComputeNumberOfSurfaces();
50
51     bool PrepareWritePointMacro(SmartPointer< Surface > surface,
52                                 DataSet & surfaceDS,
53                                 const TransferSyntax & ts);
54
55     //0066 0001 UL 1 Number of Surfaces
56     unsigned long NumberOfSurfaces;
57 };
58
59
60 }
61
62 #endif // GDCMSURFACEWRITER_H

```

## 11.441 gdcmTagPath.h File Reference

```
#include "gdcmTag.h"
```

```
#include <vector>
```

Include dependency graph for gdcmTagPath.h:

### Classes

- class [gdcm::TagPath](#)  
*class to handle a path of tag.*

### Namespaces

- namespace [gdcm](#)

## 11.442 gdcmTagPath.h

[Go to the documentation of this file.](#)

```

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```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTAGPATH_H
15 #define GDCMTAGPATH_H
16
17 #include "gdcmTag.h"
18
19 #include <vector>
20
21 namespace gdcm
22 {
23
24 class GDCM_EXPORT TagPath
25 {
26 public:
27     TagPath();
28     ~TagPath();
29     void Print(std::ostream &) const;
30
31     bool ConstructFromString(const char *path);
32
33     static bool IsValid(const char *path);
34
35     bool ConstructFromTagList(Tag const *l, unsigned int n);
36
37     bool Push(Tag const & t);
38     bool Push(unsigned int itemnum);
39 private:
40     std::vector<Tag> Path;
41 };
42
43 } // end namespace gdcm
44
45 #endif //GDCMTAGPATH_H

```

## 11.443 gdcmUIDGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUIDGenerator.h:

### Classes

- class [gdcm::UIDGenerator](#)  
*Class for generating unique UID.*

### Namespaces

- namespace [gdcm](#)



## 11.444 gdcmUIDGenerator.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUIDGENERATOR_H
15 #define GDCMUIDGENERATOR_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT UIDGenerator
23     {
24     public:
25         UIDGenerator():Unique() {}
26
27         // Function to override the GDCM root with a user one:
28         // WARNING: This need to be a valid root, otherwise call will fail
29         // Implementation note. According to DICOM standard PS 3.5, Section 9 :
30         // Unique Identifiers (UIDs), we have:
31         /*
32         ...
33         The <org root> portion of the UID uniquely identifies an organization, (i.e., manufacturer, research
34         organization, NEMA, etc.), and is composed of a number of numeric components as defined by ISO 8824.
35         The <suffix> portion of the UID is also composed of a number of numeric components, and shall be
36         unique within the scope of the <org root>. This implies that the organization identified in the <org root>
37         is
38         responsible for guaranteeing <suffix> uniqueness by providing registration policies. These policies shall
39         guarantee <suffix> uniqueness for all UID's created by that organization. Unlike the <org root>, which may
40         be common for UID's in an organization, the <suffix> shall take different unique values between different
41         UID's that identify different objects.
42         ...
43         */
44         static void SetRoot(const char * root);
45         static const char *GetRoot();
46
47         const char* Generate();
48
49         static bool IsValid(const char *uid);
50
51         static const char *GetGDCMUID(); // who would want that in the public API ??
52
53     protected:
54         static bool GenerateUUID(unsigned char *uuid_data);
55
56     private:
57         static const char GDCM_UID[];
58         static std::string Root;
59         static std::string EncodedHardwareAddress;
60         static std::string Unique; // Buffer
61     };
62
63 } // end namespace gdcm
64
65 #endif //GDCMUIDGENERATOR_H

```

## 11.445 gdcmUUIDGenerator.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmUUIDGenerator.h:

## Classes

- class [gdcm::UUIDGenerator](#)  
*Class for generating unique UUID.*

## Namespaces

- namespace [gdcm](#)

## 11.446 gdcmUUIDGenerator.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUUUIDGENERATOR_H
15 #define GDCMUUUIDGENERATOR_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 class GDCM_EXPORT UUIDGenerator
23 {
24 public:
25     const char* Generate();
26
27     static bool IsValid(const char *uid);
28
29 private:
30     std::string Unique; // Buffer
31 };
32
33 } // end namespace gdcm
34
35 #endif //GDCMUUUIDGENERATOR_H

```

## 11.447 gdcmValidate.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmValidate.h:

## Classes

- class [gdcm::Validate](#)  
*Validate class.*

## Namespaces

- namespace [gdcm](#)

## 11.448 gdcmValidate.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMVALIDATE_H
15 #define GDCMVALIDATE_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
21
22     class GDCM_EXPORT Validate
23     {
24     public:
25         Validate();
26         ~Validate();
27
28         void SetFile(File const &f) { F = &f; }
29         const File& GetValidatedFile() { return V; }
30
31         void Validation();
32
33     protected:
34         const File *F;
35         File V; // Validated file
36     };
37
38 } // end namespace gdcm
39
40 #endif //GDCMVALIDATE_H

```

## 11.449 gdcmWaveform.h File Reference

```
#include "gdcmFile.h"
```

Include dependency graph for gdcmWaveform.h:

## Classes

- class [gdcm::Waveform](#)  
*Waveform class.*

## Namespaces

- namespace [gdcm](#)

## 11.450 gdcmWaveform.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMWAVEFORM_H
15 #define GDCMWAVEFORM_H
16
17 #include "gdcmFile.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT Waveform
22     {
23     public:
24         Waveform() = default;
25     private:
26     };
27 } // end namespace gdcm
28
29 #endif //GDCMWAVEFORM_H

```

## 11.451 gdcmXMLPrinter.h File Reference

```

#include "gdcmFile.h"
#include "gdcmDataElement.h"

```

Include dependency graph for gdcmXMLPrinter.h:

### Classes

- class [gdcm::XMLPrinter](#)

### Namespaces

- namespace [gdcm](#)

## 11.452 gdcmXMLPrinter.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMXMLPRINTER_H
15 #define GDCMXMLPRINTER_H
16
17 /*
18
19 The Normative version of the XML Schema for the Native DICOM Model follows:
20
21
22
23 start = element NativeDicomModel { DicomDataSet }
24
25 # A DICOM Data Set is as defined in PS3.5. It does not appear
26 # as an XML Element, since it does not appear in the binary encoded
27 # DICOM objects. It exists here merely as a documentation aid.
28
29 DicomDataSet = DicomAttribute*
30 DicomAttribute = element DicomAttribute {
31   Tag, VR, Keyword?, PrivateCreator?,
32   ( BulkData | Value+ | Item+ | PersonName+ )?
33 }
34
35 BulkData = element BulkData{ UUID }
36 Value = element Value { Number, xsd:string }
37 Item = element Item { Number, DicomDataSet }
38 PersonName = element PersonName {
39   Number,
40   element SingleByte { NameComponents }?,
41   element Ideographic { NameComponents }?,
42   element Phonetic
43   { NameComponents }?
44 }
45
46 NameComponents =
47   element FamilyName {xsd:string}?,
48   element GivenName {xsd:string}?,
49   element MiddleName {xsd:string}?,
50   element NamePrefix {xsd:string}?,
51   element NameSuffix {xsd:string}?
52
53 # keyword is the attribute tag from PS3.6
54 # (derived from the DICOM Attribute's name)
55 Keyword = attribute keyword { xsd:token }
56 # canonical XML definition of Hex, with lowercase letters disallowed
57 Tag = attribute tag { xsd:string{ minLength="8" maxLength="8" pattern="[0-9A-F]{8}" } }
58 VR = attribute vr { "AE" | "AS" | "AT" | "CS" | "DA" | "DS" | "DT" | "FL" | "FD"
59 | "IS" | "LO" | "LT" | "OB" | "OF" | "OW" | "PN" | "SH" | "SL"
60 | "SQ" | "SS" | "ST" | "TM" | "UI" | "UL" | "UN" | "US" | "UT" }
61 PrivateCreator = attribute privateCreator{ xsd:string }
62 UUID = attribute uuid { xsd:string }
63 Number = attribute number { xsd:positiveInteger }
64
65
66 */
67
68 #include "gdcmFile.h"
69 #include "gdcmDataElement.h"
70
71 namespace gdcm
72 {
73
74   class DataSet;
75   class DictEntry;
76   class Dicts;
77
78   class GDCM_EXPORT XMLPrinter
79   {
80   public:
81     XMLPrinter();
82     virtual ~XMLPrinter();
83
84     // Set file
85     void SetFile(File const& f) { F = &f; }
86
87

```

```

88
89  typedef enum {
90
91      OnlyUUID = 0 ,
92      LOADBULKDATA = 1
93
94  } PrintStyles;
95
96  // Set PrintStyle value
97  void SetStyle(PrintStyles ps)
98  {
99      PrintStyle = ps;
100  }
101
102  // Get PrintStyle value
103  PrintStyles GetPrintStyle()const
104  {
105      return PrintStyle;
106  }
107
108  // Print
109  void Print(std::ostream& os);
110
111  // Print an individual dataset
112  void PrintDataSet(const DataSet &ds, const TransferSyntax &ts, std::ostream& os);
113
114  //void PrintUID(std::ostream &os);
115
116  virtual void HandleBulkData(const char *uuid, const TransferSyntax &ts,
117      const char *bulkdata, size_t bulklen);
118
119 protected:
120
121  VR PrintDataElement(std::ostream &os, const Dicts &dicts, const DataSet &ds, const DataElement &de, const
122      TransferSyntax &ts);
123
124  void PrintSQ(const SequenceOfItems *sqi, const TransferSyntax &ts, std::ostream &os);
125
126  PrintStyles PrintStyle;
127
128  const File *F;
129
130 };
131
132 };
133
134 } // end namespace gdcm
135
136 #endif //GDCMXMLPRINTER_H

```

## 11.453 gdcmAAbortPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAbortPDU.h:

### Classes

- class [gdcm::network::AAbortPDU](#)  
*AAbortPDU.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.454 gdcmAAbortPDU.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMAABORTPDU_H
15 #define GDCMAABORTPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmBasePDU.h"
19
20 namespace gdcm
21 {
22
23 namespace network
24 {
25
26 class GDCM_EXPORT AAbortPDU : public BasePDU
27 {
28 public:
29     AAbortPDU();
30     std::istream &Read(std::istream &is) override;
31     const std::ostream &Write(std::ostream &os) const override;
32
33     size_t Size() const override;
34     void Print(std::ostream &os) const override;
35
36     bool IsLastFragment() const override { return true; }
37
38     void SetSource(const uint8_t s);
39     void SetReason(const uint8_t r);
40
41 private:
42     static const uint8_t ItemType; // PDUType ?
43     static const uint8_t Reserved2;
44     uint32_t ItemLength; // PDU Length
45     static const uint8_t Reserved7;
46     static const uint8_t Reserved8;
47     uint8_t Source;
48     uint8_t Reason; // diag
49 };
50
51 } // end namespace network
52
53 } // end namespace gdcm
54
55 #endif //GDCMAABORTPDU_H

```

## 11.455 gdcmAAssociateACPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmApplicationContext.h"
#include "gdcmPresentationContextAC.h"
#include "gdcmUserInformation.h"
#include "gdcmBasePDU.h"
#include <vector>

```

Include dependency graph for gdcmAAssociateACPDU.h:

## Classes

- class [gdcm::network::AAssociateACPDU](#)  
*AAssociateACPDU.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.456 gdcmAAssociateACPDU.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMAASSOCIATEACPDU_H
15 #define GDCMAASSOCIATEACPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmApplicationContext.h"
19 #include "gdcmPresentationContextAC.h"
20 #include "gdcmUserInformation.h"
21 #include "gdcmBasePDU.h"
22
23 #include <vector>
24
25 namespace gdcm
26 {
27
28     namespace network
29     {
30         class AAssociateRQPDU;
31
32         class AAssociateACPDU : public BasePDU
33         {
34         public:
35             AAssociateACPDU();
36             std::istream &Read(std::istream &is) override;
37             const std::ostream &Write(std::ostream &os) const override;
38
39             void AddPresentationContextAC( PresentationContextAC const &pcac );
40
41             typedef std::vector<PresentationContextAC>::size_type SizeType;
42             const PresentationContextAC &GetPresentationContextAC( SizeType i ) {
43                 assert( !PresContextAC.empty() && i < PresContextAC.size() );
44                 return PresContextAC[i];
45             }
46             SizeType GetNumberOfPresentationContextAC()const {
47                 return PresContextAC.size();
48             }
49             const UserInformation &GetUserInformation()const { return UserInfo; }
50
51             SizeType Size() const override;
52
53             void Print(std::ostream &os) const override;
54             bool IsLastFragment()const override { return true; }
55
56         };
57     }
58 }

```



```

61 void InitFromRQ( AAssociateRQPDU const & rqpdu );
62 protected:
63 friend class AAssociateRQPDU;
64 void SetCalledAETitle(const char calledaetitle[16]);
65 void SetCallingAETitle(const char callingaetitle[16]);
66
67 private:
68 void InitSimple( AAssociateRQPDU const & rqpdu );
69
70 private:
71 static const uint8_t ItemType; // PDUType ?
72 static const uint8_t Reserved2;
73 uint32_t PDULength; // len of
74 static const uint16_t ProtocolVersion;
75 static const uint16_t Reserved9_10;
76
77 // This reserved field shall be sent with a value identical to the value
78 // received in the same field of the A-ASSOCIATE-RQ PDU, but its value
79 // shall not be tested when received.
80 char Reserved11_26[16];
81 // This reserved field shall be sent with a value identical to the value
82 // received in the same field of the A-ASSOCIATE-RQ PDU, but its value
83 // shall not be tested when received.
84 char Reserved27_42[16];
85 // This reserved field shall be sent with a value identical to the value
86 // received in the same field of the A-ASSOCIATE-RQ PDU, but its value
87 // shall not be tested when received.
88 char Reserved43_74[32];
89 /*
90 75-xxx Variable items This variable field shall contain the following items: one Application
91 Context Item, one or more Presentation Context Item(s) and one User
92 Information Item. For a complete description of these items see Sections
93 7.1.1.2, 7.1.1.14, and 7.1.1.6.
94 */
95 ApplicationContext AppContext;
96 std::vector<PresentationContextAC> PresContextAC;
97 UserInformation UserInfo;
98 };
99
100 } // end namespace network
101
102 } // end namespace gdcm
103
104 #endif //GDCMAASSOCIATEACPDU_H

```

## 11.457 gdcmAAssociateRJPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAAssociateRJPDU.h:

### Classes

- class [gdcm::network::AAssociateRJPDU](#)  
*AAssociateRJPDU.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.458 gdcmAAssociateRJPDU.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMAASSOCIATERJPDU_H
15 #define GDCMAASSOCIATERJPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmBasePDU.h"
19
20 namespace gdcm
21 {
22
23     namespace network
24     {
25
31         class AAssociateRJPDU : public BasePDU
32         {
33         public:
34             AAssociateRJPDU();
35             std::istream &Read(std::istream &is) override;
36             const std::ostream &Write(std::ostream &os) const override;
37             void Print(std::ostream &os) const override;
38             size_t Size() const override;
39             bool IsLastFragment() const override { return true; }
40         private:
41             static const uint8_t ItemType; // PDUType ?
42             static const uint8_t Reserved2;
43             uint32_t ItemLength; // PDU Length ?
44             static const uint8_t Reserved8;
45             uint8_t Result;
46             uint8_t Source;
47             uint8_t Reason; // diag ?
48         };
49
50     } // end namespace network
51
52 } // end namespace gdcm
53
54 #endif //GDCMAASSOCIATERJPDU_H

```

## 11.459 gdcmAAssociateRQPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmVR.h"
#include "gdcmApplicationContext.h"
#include "gdcmPresentationContextRQ.h"
#include "gdcmUserInfoInformation.h"
#include "gdcmBasePDU.h"

```

Include dependency graph for gdcmAAssociateRQPDU.h:

### Classes

- class [gdcm::network::AAssociateRQPDU](#)  
[AAssociateRQPDU](#).

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.460 gdcmAAssociateRQPDU.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMASSOCIATERQPDU_H
15 #define GDCMASSOCIATERQPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmVR.h" // AECComp
19 #include "gdcmApplicationContext.h"
20 #include "gdcmPresentationContextRQ.h"
21 #include "gdcmUserInformation.h"
22 #include "gdcmBasePDU.h"
23
24 namespace gdcm
25 {
26
27 namespace network
28 {
29
30 class AAssociateACPDU;
31 class AAssociateRQPDU : public BasePDU
32 {
33 public:
34     AAssociateRQPDU();
35     std::istream &Read(std::istream &is) override;
36     const std::ostream &Write(std::ostream &os) const override;
37     size_t Size() const override;
38     void AddPresentationContext( PresentationContextRQ const &pc );
39
40     void SetCalledAETitle(const char calledaetitle[16]);
41     std::string GetCalledAETitle()const { return std::string(CalledAETitle,16); }
42
43     void SetCallingAETitle(const char callingaetitle[16]);
44     std::string GetCallingAETitle()const { return std::string(CallingAETitle,16); }
45
46     static bool IsAETitleValid(const char title[16]);
47
48     //void InitFromRQ( AAssociateACPDU &acpdu );
49
50     void Print(std::ostream &os) const override;
51
52     AAssociateRQPDU(const AAssociateRQPDU &pdu):BasePDU(pdu)
53     {
54         assert( 0 );
55     }
56     //this function fails to compile on windows.
57     // AAssociateRQPDU &operator=(const AAssociateRQPDU &_val)
58     // {
59     //     assert( 0 );
60     // }
61
62     typedef std::vector<PresentationContextRQ>::size_type SizeType;
63     SizeType GetNumberOfPresentationContext()const {
64         return PresContext.size();
65     }
66
67 }
68
69 }

```

```

75 PresentationContextRQ const &GetPresentationContext(SizeType i) const {
76     assert( !PresContext.empty() && i < PresContext.size() );
77     return PresContext[i];
78 }
79 typedef std::vector<PresentationContextRQ> PresentationContextArrayType;
80 PresentationContextArrayType const &GetPresentationContexts() { return PresContext; }
81
82 const PresentationContextRQ *GetPresentationContextByID(uint8_t i) const;
83 const PresentationContextRQ *GetPresentationContextByAbstractSyntax(AbstractSyntax const & absyn ) const;
84 bool IsLastFragment() const override { return true; }
85
86 const UserInformation & GetUserInformation() const { return UserInfo; }
87 void SetUserInformation( UserInformation const & ui );
88
89 protected:
90     friend class AAssociateACPDU;
91     std::string GetReserved43_74() const;
92
93 private:
94     // 1 PDU-type 01H
95     static const uint8_t ItemType; // PDUType ?
96     // 2 Reserved This reserved field shall be sent with a value 00H but not tested to this value when
97     // received.
98     static const uint8_t Reserved2;
99     /* 3-6 PDU-length This PDU-length shall be the number of bytes from the first byte of the
100     following field to the last byte of the variable field. It shall be encoded as
101     an unsigned binary number
102     uint32_t ItemLength; // PDU Length
103     */
104     /* 7-8 Protocol-version This two byte field shall use one bit to identify each version of the
105     DICOM UL protocol supported by the calling end-system. This is
106     Version 1 and shall be identified with bit 0 set. A receiver of this PDU
107     implementing only this version of the DICOM UL protocol shall only test
108     that bit 0 is set.
109     */
110     static const uint16_t ProtocolVersion;
111     /*
112     9-10 Reserved This reserved field shall be sent with a value 0000H but not tested to
113     this value when received.
114     */
115     static const uint16_t Reserved9_10;
116     /*
117     11-26 Called-AE-title Destination DICOM Application Name. It shall be encoded as 16
118     characters as defined by the ISO 646:1990-Basic G0 Set with leading
119     and trailing spaces (20H) being non-significant. The value made of 16
120     spaces (20H) meaning "no Application Name specified" shall not be
121     used. For a complete description of the use of this field, see Section
122     7.1.1.4.
123     */
124     char CalledAETitle[16];
125     /*
126     27-42 Calling-AE-title Source DICOM Application Name. It shall be encoded as 16
127     characters as defined by the ISO 646:1990-Basic G0 Set with leading
128     and trailing spaces (20H) being non-significant. The value made of 16
129     spaces (20H) meaning "no Application Name specified" shall not be
130     used. For a complete description of the use of this field, see Section
131     7.1.1.3.
132     */
133     char CallingAETitle[16];
134     /*
135     43-74 Reserved This reserved field shall be sent with a value 00H for all bytes but not
136     tested to this value when received
137     */
138     char Reserved43_74[32]; // { 0 }
139     /*
140     75-xxx Variable items This variable field shall contain the following items: one Application
141     Context Item, one or more Presentation Context Items and one User
142     Information Item. For a complete description of the use of these items
143     see Sections 7.1.1.2, 7.1.1.13, and 7.1.1.6.
144     */
145     ApplicationContext AppContext;
146     std::vector<PresentationContextRQ> PresContext;
147     UserInformation UserInfo;
148 };
149
150 } // end namespace network
151 } // end namespace gdcm
152
153 #endif //GDCMAASSOCIATERQPDU_H

```

## 11.461 gdcmAbstractSyntax.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmUIDs.h"
#include "gdcmDataElement.h"
```

Include dependency graph for gdcmAbstractSyntax.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::AbstractSyntax](#)  
*AbstractSyntax.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.462 gdcmAbstractSyntax.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMABSTRACTSYNTAX_H
15 #define GDCMABSTRACTSYNTAX_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmUIDs.h"
19 #include "gdcmDataElement.h"
20
21 namespace gdcm
22 {
23
24     namespace network
25     {
26
27         class AbstractSyntax
28         {
29         public:
30             AbstractSyntax();
31             std::istream &Read(std::istream &is);
32             const std::ostream &Write(std::ostream &os) const;
33
34             void SetName( const char *name ) { UpdateName( name ); }
35             const char *GetName() const { return Name.c_str(); }
36
37             // accept a UID::TSType also...
38             void SetNameFromUID( UID::TSType tsname );
39             //now that the PresentationContext messes around with UIDs and returns a string
40             //use that string as well.
41         };
42     }
43 }
```

```

46 //void SetNameFromUIDString( const std::string& inUIDName );
47
48 size_t Size() const;
49
50 void Print(std::ostream &os) const;
51
52 bool operator==(const AbstractSyntax & as) const
53 {
54     return Name == as.Name;
55 }
56
57 DataElement GetAsDataElement() const;
58
59 private:
60 void UpdateName( const char *name );
61 static const uint8_t ItemType;
62 static const uint8_t Reserved2;
63 uint16_t ItemLength; // len of
64 std::string /*AbstractSyntax*/ Name; // UID
65 };
66
67 } // end namespace network
68 } // end namespace gdcm
69
70 #endif //GDCMABSTRACTSYNTAX_H

```

## 11.463 gdcmApplicationContext.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmApplicationContext.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ApplicationContext](#)  
*ApplicationContext.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.464 gdcmApplicationContext.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/

```

```

14 #ifndef GDCMAPPLICATIONCONTEXT_H
15 #define GDCMAPPLICATIONCONTEXT_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 namespace network
23 {
24
25 class ApplicationContext
26 {
27 public:
28     ApplicationContext();
29     std::istream &Read(std::istream &is);
30     const std::ostream &Write(std::ostream &os) const;
31
32     void SetName( const char *name ) { UpdateName( name ); }
33     const char *GetName()const { return Name.c_str(); }
34     size_t Size() const;
35
36     //static const uint8_t GetItemType() { return ItemType; }
37     void Print(std::ostream &os) const;
38
39 private:
40     void UpdateName( const char *name );
41     static const uint8_t ItemType;
42     static const uint8_t Reserved2;
43     uint16_t ItemLength; // len of application context name
44     std::string /*ApplicationContext*/ Name; // UID
45 };
46
47 } // end namespace network
48
49 } // end namespace gdcm
50
51 #endif //GDCMAPPLICATIONCONTEXT_H

```

## 11.465 gdcmAReleaseRPPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAReleaseRPPDU.h:

### Classes

- class [gdcm::network::AReleaseRPPDU](#)  
*AReleaseRPPDU.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.466 gdcmAReleaseRPPDU.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMARELEASERPPDU_H
15 #define GDCMARELEASERPPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmBasePDU.h"
19
20 namespace gdcm
21 {
22
23 namespace network
24 {
25
31 class AReleaseRPPDU : public BasePDU
32 {
33 public:
34     AReleaseRPPDU();
35     std::istream &Read(std::istream &is) override;
36     const std::ostream &Write(std::ostream &os) const override;
37     size_t Size() const override;
38     void Print(std::ostream &os) const override;
39     bool IsLastFragment() const override { return true; }
40 private:
41     static const uint8_t ItemType; // PDUType ?
42     static const uint8_t Reserved2;
43     uint32_t ItemLength; // PDU Length
44     static const uint32_t Reserved7_10;
45 };
46
47 } // end namespace network
48
49 } // end namespace gdcm
50
51 #endif //GDCMARELEASERPPDU_H

```

## 11.467 gdcmAReleaseRQPDU.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmBasePDU.h"
```

Include dependency graph for gdcmAReleaseRQPDU.h:

### Classes

- class `gdcm::network::AReleaseRQPDU`  
*AReleaseRQPDU.*

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`



## 11.468 gdcmAReleaseRQPDU.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMARELEASERQPDU_H
15 #define GDCMARELEASERQPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmBasePDU.h"
19
20 namespace gdcm
21 {
22
23     namespace network
24     {
25
26         class AReleaseRQPDU : public BasePDU
27         {
28         public:
29             AReleaseRQPDU();
30             std::istream &Read(std::istream &is) override;
31             const std::ostream &Write(std::ostream &os) const override;
32             size_t Size() const override;
33             void Print(std::ostream &os) const override;
34             bool IsLastFragment() const override { return true; }
35         private:
36             static const uint8_t ItemType; // PDUType ?
37             static const uint8_t Reserved2;
38             uint32_t ItemLength; // PDU Length
39             static const uint32_t Reserved7_10;
40         };
41
42     } // end namespace network
43
44 } // end namespace gdcm
45
46 #endif //GDCMARELEASERQPDU_H

```

## 11.469 gdcmARTIMTimer.h File Reference

This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ARTIMTimer](#)  
*ARTIMTimer.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.470 gdcmARTIMTimer.h

[Go to the documentation of this file.](#)

```

1  /*=====
2  *
3  *   Copyright NumFOCUS
4  *
5  *   Licensed under the Apache License, Version 2.0 (the "License");
6  *   you may not use this file except in compliance with the License.
7  *   You may obtain a copy of the License at
8  *
9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMARTIMTIMER_H
19 #define GDCMARTIMTIMER_H
20
21 namespace gdcm {
22     namespace network{
23     class ARTIMTimer
24     {
25     private:
26         double mStartTime; //ms timing should be good enough, but there are also
27         //high-resolution timing options. Those return doubles. For now,
28         //go with integer timing solutions based on milliseconds (DWORD on windows),
29         //but leave as doubles to ease transitions to other timing methods.
30
31         double mTimeout;
32         //once GetCurrentTime() -mStartTime > mTimeout, GetHasExpired returns true.
33
34         double GetCurrentTime() const; //a platform-specific implementation of getting the
35         //current time.
36
37     public:
38         ARTIMTimer(); //initiates the start and timeout at -1;
39         void Start(); // 'start' the timer by getting the current wall time
40         void Stop(); // 'stop' the timer by resetting the 'start' to -1;
41         void SetTimeout(double inTimeout);
42         double GetTimeout() const;
43
44         double GetElapsedTime() const;
45
46         bool GetHasExpired() const;
47
48     };
49 }
50
51 #endif //GDCMARTIMTIMER_H

```

## 11.471 gdcmAsynchronousOperationsWindowSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmAsynchronousOperationsWindowSub.h:

### Classes

- class [gdcm::network::AsynchronousOperationsWindowSub](#)  
*AsynchronousOperationsWindowSub.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.472 gdcmAsynchronousOperationsWindowSub.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMASYNCHRONOUSOPERATIONSWINDOWSUB_H
15 #define GDCMASYNCHRONOUSOPERATIONSWINDOWSUB_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     namespace network
23     {
24
25         class AsynchronousOperationsWindowSub
26         {
27         public:
28             AsynchronousOperationsWindowSub();
29             std::istream &Read(std::istream &is);
30             const std::ostream &Write(std::ostream &os) const;
31
32             size_t Size() const;
33             void Print(std::ostream &os) const;
34
35         private:
36             static const uint8_t ItemType;
37             static const uint8_t Reserved2;
38             uint16_t ItemLength;
39             uint16_t MaximumNumberOperationsInvoked;
40             uint16_t MaximumNumberOperationsPerformed;
41         };
42     }
43 } // end namespace network
44
45 } // end namespace gdcm
46
47 #endif // GDCMASYNCHRONOUSOPERATIONSWINDOWSUB_H

```

## 11.473 gdcmBaseCompositeMessage.h File Reference

```

#include "gdcmPresentationDataValue.h"
#include "gdcmBaseRootQuery.h"
#include <vector>

```

Include dependency graph for gdcmBaseCompositeMessage.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::network::BaseCompositeMessage](#)  
*BaseCompositeMessage.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.474 gdcmBaseCompositeMessage.h

[Go to the documentation of this file.](#)

```

1  /*=====
2  *
3  *   Copyright NumFOCUS
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7  *   You may obtain a copy of the License at
8  *
9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMBASECOMPOSITEMESSAGE_H
19 #define GDCMBASECOMPOSITEMESSAGE_H
20
21 #include "gdcmPresentationDataValue.h"
22 #include "gdcmBaseRootQuery.h"
23
24 #include <vector>
25
26 namespace gdcm
27 {
28     namespace network
29     {
30         class ULConnection;
31         class BaseCompositeMessage
32         {
33         public:
34             virtual ~BaseCompositeMessage() = default;
35             //construct the appropriate pdv and dataset for this message
36             //for instance, setting tag 0x0,0x100 to the appropriate value
37             //the pdv, as described in Annex E of 3.8-2009, is the first byte
38             //of the message (the MessageHeader), and then the subsequent dataset
39             //that describes the operation.
40             virtual std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
41                 const BaseRootQuery * inRootQuery) = 0;
42         };
43     }
44 }
45
46 #endif //BASECOMPOSITEMESSAGE_H

```

## 11.475 gdcmBaseNormalizedMessage.h File Reference

```

#include "gdcmPresentationDataValue.h"
#include "gdcmBaseQuery.h"
#include <vector>

```

Include dependency graph for gdcmBaseNormalizedMessage.h: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::network::BaseNormalizedMessage](#)  
*BaseNormalizedMessage.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.476 gdcmBaseNormalizedMessage.h

[Go to the documentation of this file.](#)

```

1  /*****
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2014 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 *****/
14 #ifndef GDCMBASENORMALIZEDMESSAGE_H
15 #define GDCMBASENORMALIZEDMESSAGE_H
16
17 #include "gdcmPresentationDataValue.h"
18 #include "gdcmBaseQuery.h"
19
20 #include <vector>
21
22 namespace gdcm
23 {
24     namespace network
25     {
26         class ULConnection;
27         class BaseNormalizedMessage
28         {
29         public:
30             virtual ~BaseNormalizedMessage() = default;
31             //construct the appropriate pdv and dataset for this message
32             //for instance, setting tag 0x0,0x100 to the appropriate value
33             //the pdv, as described in Annex E of 3.8-2009, is the first byte
34             //of the message (the MessageHeader), and then the subsequent dataset
35             //that describes the operation.
36             virtual std::vector<PresentationDataValue> ConstructPDV( const ULConnection &inConnection,
37                                                                     const BaseQuery * inQuery) = 0;
38         };
39     }
40 }
41 #endif //GDCMBASENORMALIZEDMESSAGE_H

```

## 11.477 gdcmBasePDU.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmBasePDU.h: This graph shows which files directly or indirectly include this file:

## Classes

- class `gdcm::network::BasePDU`  
*BasePDU.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 11.478 gdcmBasePDU.h

[Go to the documentation of this file.](#)

```

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2 *
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10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMBASEPDU_H
19 #define GDCMBASEPDU_H
20
21 #include "gdcmTypes.h"
22
23 namespace gdcm
24 {
25     namespace network
26     {
27
28     class BasePDU
29     {
30     public:
31         virtual ~BasePDU() = default;
32
33         virtual std::istream &Read(std::istream &is) = 0;
34         virtual const std::ostream &Write(std::ostream &os) const = 0;
35
36         virtual size_t Size() const = 0;
37         virtual void Print(std::ostream &os) const = 0;
38
39         virtual bool IsLastFragment() const = 0;
40     };
41 } // end namespace network
42 } // end namespace gdcm
43
44 #endif // GDCMBASEPDU_H

```

## 11.479 gdcmBaseQuery.h File Reference

```

#include "gdcmDataSet.h"
#include "gdcmUIDs.h"
#include "gdcmObject.h"

```

Include dependency graph for `gdcmBaseQuery.h`: This graph shows which files directly or indirectly include this file:

## Classes

- class [gdcm::BaseQuery](#)  
*BaseQuery.*

## Namespaces

- namespace [gdcm](#)

## Enumerations

- enum [gdcm::ENQueryType](#) {  
  [gdcm::eCreateMMPS](#) = 0 ,  
  [gdcm::eSetMMPS](#) }

## 11.480 gdcmBaseQuery.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMBASEQUERY_H
19 #define GDCMBASEQUERY_H
20
21 #include "gdcmDataSet.h"
22 #include "gdcmUIDs.h"
23 #include "gdcmObject.h"
24
25 namespace gdcm
26 {
27     class QueryFactory;
28     class DictEntry;
29
30     enum ENQueryType
31     {
32         eCreateMMPS = 0,
33         eSetMMPS
34     };
35
36     class GDCM_EXPORT BaseQuery : public Object
37     {
38     protected:
39         DataSet mDataSet;
40         friend class QueryFactory;
41         BaseQuery();
42
43         std::string mSopInstanceUID;
44     };
45
46
47
48
49
50
51
52

```

```

53 void SetSearchParameter(const Tag& inTag, const DictEntry& inDictEntry, const std::string& inValue);
54
55 bool ValidDataSet( const DataSet & dataSetToValid, const DataSet & dataSetReference ) const ;
56 public:
57 ~BaseQuery() override;
58
59 void SetSearchParameter(const Tag& inTag, const std::string& inValue);
60 void SetSearchParameter(const std::string& inKeyword, const std::string& inValue);
61
62 const std::ostream &WriteHelpFile(std::ostream &os);
63
64 //this function allows writing of the query to disk for storing for future use
65 //virtual in case it needs to be overridden
66 //returns false if the operation failed
67 bool WriteQuery(const std::string& inFileName);
68
69 DataSet const & GetQueryDataSet() const;
70 DataSet & GetQueryDataSet();
71 void AddQueryDataSet(const DataSet & ds);
72
73 virtual bool ValidateQuery( bool inStrict = true ) const = 0;
74
75 virtual UIDs::TSName GetAbstractSyntaxUID() const = 0;
76 std::string GetSOPInstanceUID()const { return mSopInstanceUID ; }
77 void SetSOPInstanceUID( const std::string & iSopInstanceUID ) { mSopInstanceUID = iSopInstanceUID ; }
78
79
80
81
82 void Print(std::ostream &os) const override;
83 };
84
85 } // end namespace gdcm
86
87 #endif //GDCMBASEROOTQUERY_H

```

## 11.481 gdcmBaseRootQuery.h File Reference

```

#include "gdcmDataSet.h"
#include "gdcmUIDs.h"
#include "gdcmBaseQuery.h"
#include "gdcmQueryPatient.h"
#include "gdcmQueryStudy.h"
#include "gdcmQuerySeries.h"
#include "gdcmQueryImage.h"

```

Include dependency graph for gdcmBaseRootQuery.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::BaseRootQuery](#)  
*BaseRootQuery.*

### Namespaces

- namespace [gdcm](#)



## Enumerations

- enum `gdcm::EQueryLevel` {  
`gdcm::ePatient` = 0 ,  
`gdcm::eStudy` = 1 ,  
`gdcm::eSeries` = 2 ,  
`gdcm::eImage` = 3 }
- enum `gdcm::EQueryType` {  
`gdcm::eFind` = 0 ,  
`gdcm::eMove` ,  
`gdcm::eWLMFind` }

## 11.482 gdcmBaseRootQuery.h

[Go to the documentation of this file.](#)

```
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9 *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMBASEROOTQUERY_H
19 #define GDCMBASEROOTQUERY_H
20
21 #include "gdcmDataSet.h"
22 #include "gdcmUIDs.h"
23 #include "gdcmBaseQuery.h"
24 #include "gdcmQueryPatient.h"
25 #include "gdcmQueryStudy.h"
26 #include "gdcmQuerySeries.h"
27 #include "gdcmQueryImage.h"
28
29 namespace gdcm
30 {
31     class QueryFactory;
32     class DictEntry;
33
34     enum EQueryLevel
35     {
36         // -1 is reserved do not use
37         ePatient = 0,
38         eStudy = 1,
39         eSeries = 2,
40         eImage = 3
41     };
42     enum EQueryType
43     {
44         eFind= 0,
45         eMove,
46         eWLMFind
47     };
48
49     class GDCM_EXPORT BaseRootQuery : public BaseQuery
50     {
51     public:
52         //these four classes contain the required, unique, and optional tags from the standard.
53         //used both to list the tags as well as to validate a dataset, if ever we were to do so.
54     protected:
55         QueryPatient mPatient;
56         QueryStudy mStudy;
```

```

73  QuerySeries mSeries;
74  QueryImage mImage;
75
76  friend class QueryFactory;
77  BaseRootQuery();
78
79  ERootType mRootType; //set in construction, and it's something else in the study root type
80  std::string mHelpDescription; //used when generating the help output
81
82 public:
83  ~BaseRootQuery() override;
84
88  virtual std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) = 0;
89
93  virtual void InitializeDataSet(const EQueryLevel& inQueryLevel) = 0;
94
108  bool ValidateQuery( bool inStrict = true ) const override = 0;
109
110  static const char *GetQueryLevelString( EQueryLevel ql );
111  static int GetQueryLevelFromString( const char * str );
112
113  static QueryBase * Construct(ERootType inRootType, EQueryLevel qllevel);
114  EQueryLevel GetQueryLevelFromQueryRoot( ERootType roottype );
115 };
116
117 } // end namespace gdcm
118
119 #endif //GDCMBASEROOTQUERY_H

```

## 11.483 gdcmCEchoMessages.h File Reference

#include "gdcmBaseCompositeMessage.h"  
 Include dependency graph for gdcmCEchoMessages.h:

### Classes

- class [gdcm::network::CEchoRQ](#)  
[CEchoRQ](#).
- class [gdcm::network::CEchoRSP](#)  
[CEchoRSP](#) this file defines the messages for the cecho action.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.484 gdcmCEchoMessages.h

[Go to the documentation of this file.](#)

```

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2  *
3  *   Copyright NumFOCUS
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8  *

```

```

9 *      http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 * Unless required by applicable law or agreed to in writing, software
12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMCECHOMESSAGES_H
19 #define GDCMCECHOMESSAGES_H
20
21 #include "gdcmBaseCompositeMessage.h"
22
23 namespace gdcm{
24     namespace network{
25
26     class ULConnection;
27
28     class CEchoRQ : public BaseCompositeMessage {
29     public:
30         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
31             const BaseRootQuery* inRootQuery) override;
32     };
33
34     class CEchoRSP : public BaseCompositeMessage {
35     public:
36         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
37     };
38     }
39 }
40 #endif // GDCMCECHOMESSAGES_H

```

## 11.485 gdcmCFindMessages.h File Reference

```

#include "gdcmBaseCompositeMessage.h"
#include "gdcmBaseRootQuery.h"

```

Include dependency graph for gdcmCFindMessages.h:

### Classes

- class [gdcm::network::CFindCancelRQ](#)  
*CFindCancelRQ* this file defines the messages for the cfind action.
- class [gdcm::network::CFindRQ](#)  
*CFindRQ*.
- class [gdcm::network::CFindRSP](#)  
*CFindRSP* this file defines the messages for the cfind action.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.486 gdcmCFindMessages.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMCFINDMESSAGES_H
19 #define GDCMCFINDMESSAGES_H
20
21 #include "gdcmBaseCompositeMessage.h"
22 #include "gdcmBaseRootQuery.h"
23
24 namespace gdcm
25 {
26     namespace network
27     {
28
29         class CFindRQ : public BaseCompositeMessage
30         {
31         public:
32             std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
33                 const BaseRootQuery* inRootQuery) override;
34         };
35
36         class CFindRSP : public BaseCompositeMessage {
37         public:
38             std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
39         };
40
41         class CFindCancelRQ : public BaseCompositeMessage {
42         public:
43             std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
44         };
45     }
46 }
47 #endif

```

## 11.487 gdcmCMoveMessages.h File Reference

```

#include "gdcmBaseCompositeMessage.h"
#include "gdcmBaseRootQuery.h"

```

Include dependency graph for gdcmCMoveMessages.h:

### Classes

- class `gdcm::network::CMoveCancelRq`
- class `gdcm::network::CMoveRQ`  
`CMoveRQ`.
- class `gdcm::network::CMoveRSP`  
`CMoveRSP` this file defines the messages for the cmove action.

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.488 gdcmCMoveMessages.h

[Go to the documentation of this file.](#)

```

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2 *
3 *   Copyright NumFOCUS
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9 *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMCMOVEMESSAGES_H
19 #define GDCMCMOVEMESSAGES_H
20
21 #include "gdcmBaseCompositeMessage.h"
22 #include "gdcmBaseRootQuery.h"
23
24 namespace gdcm{
25     namespace network{
26         class ULConnection;
27     class CMoveRQ : public BaseCompositeMessage {
28     //this class will fulfill the inheritance,
29     //but additional information is needed by cmovd
30     //namely, the root type or the calling AE-TITLE
31     std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
32     public:
33     std::vector<PresentationDataValue> ConstructPDV(
34         const ULConnection &inConnection,
35         const BaseRootQuery* inRootQuery) override;
36     };
37
38 class CMoveRSP : public BaseCompositeMessage {
39     public:
40     std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
41     };
42
43 class CMoveCancelRq : public BaseCompositeMessage {
44     public:
45     std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
46     };
47 }
48
49 #endif

```

## 11.489 gdcmCommandDataSet.h File Reference

```

#include "gdcmDataSet.h"
#include "gdcmDataElement.h"

```

Include dependency graph for gdcmCommandDataSet.h:

## Classes

- class [gdcm::CommandDataSet](#)  
Class to represent a *Command DataSet*.

## Namespaces

- namespace [gdcm](#)

## Functions

- [std::ostream & gdcm::operator<<](#) (std::ostream &os, const CommandDataSet &val)

## 11.490 gdcmCommandDataSet.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 #ifndef GDCMCOMMANDDATASET_H
15 #define GDCMCOMMANDDATASET_H
16
17 #include "gdcmDataSet.h"
18 #include "gdcmDataElement.h"
19
20 namespace gdcm
21 {
22     class GDCM_EXPORT CommandDataSet : public DataSet
23     {
24     public:
25         CommandDataSet() = default;
26         ~CommandDataSet() = default;
27
28         friend std::ostream &operator<<(std::ostream &os, const CommandDataSet &_val);
29
30         // FIXME: no virtual function means: duplicate code...
31         void Insert(const DataElement& de) {
32             if ( de.GetTag().GetGroup() == 0x0000 )
33             {
34                 InsertDataElement( de );
35             }
36             else
37             {
38                 gdcmErrorMacro( "Cannot add element with group != 0x0000 in the command dataset : " << de );
39             }
40         }
41         void Replace(const DataElement& de) {
42             Remove( de.GetTag() );
43             Insert( de );
44         }
45
46         std::istream &Read(std::istream &is);
47
48         std::ostream &Write(std::ostream &os) const;
49
50
51
52
53
54
55
56

```

```

57 protected:
58 };
59 //-----
60 inline std::ostream& operator<<(std::ostream &os, const CommandDataSet &val)
61 {
62     val.Print( os );
63     return os;
64 }
65
66 } // end namespace gdcm
67
68 #endif //GDCMFILEMETAINFORMATION_H

```

## 11.491 gdcmCompositeMessageFactory.h File Reference

```

#include "gdcmPresentationDataValue.h"
#include "gdcmULConnection.h"

```

Include dependency graph for gdcmCompositeMessageFactory.h:

### Classes

- class [gdcm::network::CompositeMessageFactory](#)  
*CompositeMessageFactory.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.492 gdcmCompositeMessageFactory.h

[Go to the documentation of this file.](#)

```

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10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMCOMPOSITEMESSAGEFACTORY_H
19 #define GDCMCOMPOSITEMESSAGEFACTORY_H
20
21 #include "gdcmPresentationDataValue.h"
22 #include "gdcmULConnection.h"
23
24 namespace gdcm {
25     class BaseRootQuery;
26     class File;

```

```

27 namespace network {
28     class BasePDU;
37 class CompositeMessageFactory
38 {
39     public:
40         //the echo request only needs a properly constructed PDV.
41         //find, move, etc, may need something more robust, but since those are
42         //easily placed into the appropriate pdatapdu in the pdufactory,
43         //this approach without a base class (but done internally) is useful.
44         static std::vector<PresentationDataValue> ConstructCEchoRQ(const ULConnection& inConnection);
45
46         static std::vector<PresentationDataValue> ConstructCStoreRQ(const ULConnection& inConnection, const File
&file, bool writeDataSet = true );
47         static std::vector<PresentationDataValue> ConstructCStoreRSP(const DataSet *inDataSet, const BasePDU*
inPC);
48
49         static std::vector<PresentationDataValue> ConstructCFindRQ(const ULConnection& inConnection, const
BaseRootQuery* inRootQuery);
50
51         static std::vector<PresentationDataValue> ConstructCMoveRQ(const ULConnection& inConnection, const
BaseRootQuery* inRootQuery);
52
53     };
54 };
55 }
56 }
57
58 #endif // GDCMCOMPOSITEMESSAGEFACTORY_H

```

## 11.493 gdcmCompositeNetworkFunctions.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmBaseRootQuery.h"
#include <vector>
#include <string>

```

Include dependency graph for gdcmCompositeNetworkFunctions.h:

### Classes

- class [gdcm::CompositeNetworkFunctions](#)  
*Composite Network Functions.*

### Namespaces

- namespace [gdcm](#)

## 11.494 gdcmCompositeNetworkFunctions.h

[Go to the documentation of this file.](#)

```

1 /*=====
2 *
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```



```

10 *
11 * Unless required by applicable law or agreed to in writing, software
12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMCOMPOSITENETWORKFUNCTIONS_H
19 #define GDCMCOMPOSITENETWORKFUNCTIONS_H
20
21 #include "gdcmDirectory.h"
22 #include "gdcmBaseRootQuery.h" // EQueryLevel / EQueryType
23
24 #include <vector>
25 #include <string>
26
27 namespace gdcm
28 {
29     class GDCM_EXPORT CompositeNetworkFunctions
30     {
31     public:
32         static bool CEcho( const char *remote, uint16_t portno, const char *aetitle = nullptr,
33             const char *call = nullptr );
34
35         typedef std::pair<Tag, std::string> KeyValuePairType;
36         typedef std::vector< KeyValuePairType > KeyValuePairArrayType;
37
38         static BaseRootQuery* ConstructQuery(ERootType inRootType, EQueryLevel inQueryLevel,
39             const DataSet& queryds, EQueryType queryType = eFind );
40
41         static BaseRootQuery* ConstructQuery(ERootType inRootType, EQueryLevel inQueryLevel,
42             const KeyValuePairArrayType& keys, EQueryType queryType = eFind );
43
44         static bool CMove( const char *remote, uint16_t portno, const BaseRootQuery* query,
45             uint16_t portscp, const char *aetitle = nullptr,
46             const char *call = nullptr, const char *outputdir = nullptr);
47
48         static bool CFind( const char *remote, uint16_t portno,
49             const BaseRootQuery* query,
50             std::vector<DataSet> &retDataSets,
51             const char *aetitle = nullptr,
52             const char *call = nullptr );
53
54         static bool CStore( const char *remote, uint16_t portno,
55             const Directory::FileNamesType &filenames,
56             const char *aetitle = nullptr, const char *call = nullptr);
57     };
58 } // end namespace gdcm
59
60 #endif // GDCMCOMPOSITENETWORKFUNCTIONS_H

```

## 11.495 gdcmCStoreMessages.h File Reference

#include "gdcmBaseCompositeMessage.h"

Include dependency graph for gdcmCStoreMessages.h:

### Classes

- class [gdcm::network::CStoreRQ](#)  
*CStoreRQ.*
- class [gdcm::network::CStoreRSP](#)  
*CStoreRSP this file defines the messages for the cecho action.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.496 gdcmCStoreMessages.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
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11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMCSTOREMESSAGES_H
19 #define GDCMCSTOREMESSAGES_H
20
21 #include "gdcmBaseCompositeMessage.h"
22
23 namespace gdcm{
24 class File;
25     namespace network{
26         class BasePDU;
31 class CStoreRQ : public BaseCompositeMessage {
32     std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection, const BaseRootQuery*
inRootQuery) override;//to fulfill the virtual contract
33     public:
34         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
35             const File& file, bool writeDataSet = true );
36     };
37
42     class CStoreRSP : public BaseCompositeMessage {
43         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection, const BaseRootQuery*
inRootQuery) override;//to fulfill the virtual contract
44         public:
45             std::vector<PresentationDataValue> ConstructPDV(const DataSet* inDataSet, const BasePDU* inPC);
46     };
47 }
48 }
49 #endif // GDCMCSTOREMESSAGES_H

```

## 11.497 gdcmDIMSE.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmDIMSE.h:

## Classes

- class [gdcm::network::CEchoRQ](#)  
*CEchoRQ.*
- class [gdcm::network::CEchoRSP](#)  
*CEchoRSP this file defines the messages for the cecho action.*
- class [gdcm::network::CFind](#)
- class [gdcm::network::DIMSE](#)  
*DIMSE.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.498 gdcmDIMSE.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMDIMSE_H
15 #define GDCMDIMSE_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 namespace network
23 {
24
25 class DIMSE {
26 public:
27     typedef enum {
28         C_STORE_RQ      = 0x0001,
29         C_STORE_RSP     = 0x8001,
30         C_GET_RQ        = 0x0010,
31         C_GET_RSP       = 0x8010,
32         C_FIND_RQ       = 0x0020,
33         C_FIND_RSP      = 0x8020,
34         C_MOVE_RQ       = 0x0021,
35         C_MOVE_RSP      = 0x8021,
36         C_ECHO_RQ       = 0x0030,
37         C_ECHO_RSP      = 0x8030,
38         N_EVENT_REPORT_RQ = 0x0100,
39         N_EVENT_REPORT_RSP = 0x8100,
40         N_GET_RQ        = 0x0110,
41         N_GET_RSP       = 0x8110,
42         N_SET_RQ        = 0x0120,
43         N_SET_RSP       = 0x8120,
44         N_ACTION_RQ     = 0x0130,
45         N_ACTION_RSP    = 0x8130,
46         N_CREATE_RQ     = 0x0140,
47         N_CREATE_RSP    = 0x8140,
48         N_DELETE_RQ     = 0x0150,
49         N_DELETE_RSP    = 0x8150,
50         C_CANCEL_RQ     = 0x0FFF
51     } CommandTypes;
52 };
53
54 /*
55 9.1.5.1 C-ECHO parameters
56 Table 9.1-5
57 C-ECHO PARAMETERS
58 */
59 class CEchoRQ
60 {
61 public:
62     uint16_t      MessageID;          /* M */
63     UIComp        AffectedSOPClassUID; /* M */
64 };
65
66

```

```

74 class CEchoRSP
75 {
76 public:
77 /*
78 Message ID M U
79 Message ID Being Responded To M
80 Affected SOP Class UID M U(=)
81 Status M
82 */
83 };
84
85 class CFind
86 {
87 /*
88 Failure Refused: Out of Resources A700 (0000,0902)
89 Identifier does not match SOP Class A900 (0000,0901)
90 (0000,0902)
91 Unable to process Cxxx (0000,0901)
92 (0000,0902)
93 Cancel Matching terminated due to Cancel
94 request
95 FE00 None
96 Success Matching is complete - No final Identifier
97 is supplied.
98 0000 None
99 Pending Matches are continuing - Current Match
100 is supplied and any Optional Keys were
101 supported in the same manner as
102 Required Keys.
103 FF00 Identifier
104 Matches are continuing - Warning that
105 one or more Optional Keys were not
106 supported for existence and/or matching
107 for this Identifier.
108 FF01 Identifier
109 */
110 };
111
112 } // end namespace network
113
114 } // end namespace gdcm
115
116 #endif //GDCMDIMSE_H

```

## 11.499 gdcmFindPatientRootQuery.h File Reference

#include "gdcmBaseRootQuery.h"

Include dependency graph for gdcmFindPatientRootQuery.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::FindPatientRootQuery](#)  
*PatientRootQuery.*

### Namespaces

- namespace [gdcm](#)

## 11.500 gdcmFindPatientRootQuery.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFINDPATIENTROOTQUERY_H
15 #define GDCMFINDPATIENTROOTQUERY_H
16
17 #include "gdcmBaseRootQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT FindPatientRootQuery : public BaseRootQuery
22     {
23     public:
24         friend class QueryFactory;
25         FindPatientRootQuery();
26         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
27         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
28         bool ValidateQuery(bool inStrict = true) const override;
29         UIDs::TSName GetAbstractSyntaxUID() const override;
30     };
31 } // end namespace gdcm
32
33 #endif // GDCMFINDPATIENTROOTQUERY_H

```

## 11.501 gdcmFindStudyRootQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmFindStudyRootQuery.h:

### Classes

- class [gdcm::FindStudyRootQuery](#)  
*FindStudyRootQuery.*

### Namespaces

- namespace [gdcm](#)

## 11.502 gdcmFindStudyRootQuery.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMFINDSTUDYROOTQUERY_H
15 #define GDCMFINDSTUDYROOTQUERY_H
16
17 #include "gdcmBaseRootQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT FindStudyRootQuery : public BaseRootQuery
22     {
23     public:
24         FindStudyRootQuery();
25
26         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
27
28         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
29
30         bool ValidateQuery(bool inStrict = true) const override;
31
32         UIDs::TSName GetAbstractSyntaxUID() const override;
33     };
34 } // end namespace gdcm
35 #endif // GDCMFINDSTUDYROOTQUERY_H

```

## 11.503 gdcmImplementationClassUIDSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationClassUIDSub.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ImplementationClassUIDSub](#)  
*ImplementationClassUIDSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.504 gdcmImplementationClassUIDSub.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMPLEMENTATIONCLASSUIDSUB_H
15 #define GDCMIMPLEMENTATIONCLASSUIDSUB_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     namespace network
23     {
24
25         class ImplementationClassUIDSub
26         {
27         public:
28             ImplementationClassUIDSub();
29             std::istream &Read(std::istream &is);
30             const std::ostream &Write(std::ostream &os) const;
31
32             size_t Size() const;
33
34             void Print(std::ostream &os) const;
35
36         private:
37             static const uint8_t ItemType;
38             static const uint8_t Reserved2;
39             uint16_t ItemLength;
40             std::string ImplementationClassUID;
41         };
42     } // end namespace network
43 } // end namespace gdcm
44
45 #endif //GDCMMAXIMUMLENGTHSUB_H

```

## 11.505 gdcmImplementationUIDSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationUIDSub.h:

### Classes

- class [gdcm::network::ImplementationUIDSub](#)  
*ImplementationUIDSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.506 gdcmImplementationUIDSub.h

[Go to the documentation of this file.](#)

```

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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMPLEMENTATIONUIDSUB_H
15 #define GDCMIMPLEMENTATIONUIDSUB_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 namespace network
23 {
24
25     class GDCM_EXPORT ImplementationUIDSub
26     {
27     public:
28         ImplementationUIDSub();
29         const std::ostream &Write(std::ostream &os) const;
30     private:
31         static const uint8_t ItemType;
32         static const uint8_t Reserved2;
33         uint16_t ItemLength;
34         std::string ImplementationClassUID;
35     };
36
37 } // end namespace network
38
39 } // end namespace gdcm
40
41 #endif //GDCMMAXIMUMLENGTHSUB_H

```

## 11.507 gdcmImplementationVersionNameSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmImplementationVersionNameSub.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ImplementationVersionNameSub](#)  
*ImplementationVersionNameSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)



## 11.508 gdcmImplementationVersionNameSub.h

[Go to the documentation of this file.](#)

```

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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMIMPLEMENTATIONVERSIONNAMESUB_H
15 #define GDCMIMPLEMENTATIONVERSIONNAMESUB_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     namespace network
23     {
24
25         class ImplementationVersionNameSub
26         {
27         public:
28             ImplementationVersionNameSub();
29             std::istream &Read(std::istream &is);
30             const std::ostream &Write(std::ostream &os) const;
31
32             size_t Size() const;
33             void Print(std::ostream &os) const;
34
35         private:
36             static const uint8_t ItemType;
37             static const uint8_t Reserved2;
38             uint16_t ItemLength;
39             std::string ImplementationVersionName;
40         };
41     } // end namespace network
42 } // end namespace gdcm
43
44 #endif //GDCMMAXIMUMLENGTHSUB_H

```

## 11.509 gdcmMaximumLengthSub.h File Reference

```
#include "gdcmTypes.h"
```

Include dependency graph for gdcmMaximumLengthSub.h: This graph shows which files directly or indirectly include this file:

### Classes

- class `gdcm::network::MaximumLengthSub`  
*MaximumLengthSub.*

### Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 11.510 gdcmMaximumLengthSub.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMAXIMUMLENGTHSUB_H
15 #define GDCMMAXIMUMLENGTHSUB_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 namespace network
23 {
24
25 class MaximumLengthSub
26 {
27 public:
28     MaximumLengthSub();
29     std::istream &Read(std::istream &is);
30     const std::ostream &Write(std::ostream &os) const;
31
32     size_t Size() const;
33
34     uint32_t GetMaximumLength()const { return MaximumLength; }
35     void SetMaximumLength(uint32_t maximumlength);
36
37     void Print(std::ostream &os) const;
38
39 private:
40     static const uint8_t ItemType;
41     static const uint8_t Reserved2;
42     uint16_t ItemLength;
43     uint32_t MaximumLength;
44 };
45
46 } // end namespace network
47
48 } // end namespace gdcm
49
50 #endif //GDCMMAXIMUMLENGTHSUB_H

```

## 11.511 gdcmModalityPerformedProcedureStepCreateQuery.h File Reference

```
#include "gdcmBaseQuery.h"
```

Include dependency graph for gdcmModalityPerformedProcedureStepCreateQuery.h:

### Classes

- class [gdcm::ModalityPerformedProcedureStepCreateQuery](#)  
*ModalityPerformedProcedureStepCreateQuery.*

## Namespaces

- namespace [gdcm](#)

## 11.512 gdcmModalityPerformedProcedureStepCreateQuery.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMODALITYPERFORMEDPROCEDURESTEPCREATEQUERY_H
15 #define GDCMMODALITYPERFORMEDPROCEDURESTEPCREATEQUERY_H
16
17 #include "gdcmBaseQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT ModalityPerformedProcedureStepCreateQuery : public BaseQuery{
22     friend class QueryFactory;
23     public:
24         ModalityPerformedProcedureStepCreateQuery( const std::string & iSopInstanceUID );
25
26         gdcm::DataSet GetRequiredDataSet() const;
27         bool ValidateQuery(bool inStrict = true) const override;
28         UIDs::TSName GetAbstractSyntaxUID() const override;
29     };
30 } // end namespace gdcm
31
32 #endif // GDCMMODALITYPERFORMEDPROCEDURESTEPCREATEQUERY_H

```

## 11.513 gdcmModalityPerformedProcedureStepSetQuery.h File Reference

```
#include "gdcmBaseQuery.h"
```

Include dependency graph for gdcmModalityPerformedProcedureStepSetQuery.h:

## Classes

- class [gdcm::ModalityPerformedProcedureStepSetQuery](#)  
[\*ModalityPerformedProcedureStepSetQuery.\*](#)

## Namespaces

- namespace [gdcm](#)

## 11.514 gdcmModalityPerformedProcedureStepSetQuery.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMODALITYPERFORMEDPROCEDURESTEPSETQUERY_H
15 #define GDCMMODALITYPERFORMEDPROCEDURESTEPSETQUERY_H
16
17 #include "gdcmBaseQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT ModalityPerformedProcedureStepSetQuery : public BaseQuery{
22     friend class QueryFactory;
23     public:
24         ModalityPerformedProcedureStepSetQuery( const std::string & iSopInstanceUID );
25
26         gdcm::DataSet GetRequiredDataSet() const;
27         bool ValidateQuery(bool inStrict = true) const override;
28         UIDs::TSName GetAbstractSyntaxUID() const override;
29     };
30 } // end namespace gdcm
31
32 #endif // GDCMMODALITYPERFORMEDPROCEDURESTEPSETQUERY_H

```

## 11.515 gdcmMovePatientRootQuery.h File Reference

```
#include "gdcmFindPatientRootQuery.h"
```

Include dependency graph for gdcmMovePatientRootQuery.h:

### Classes

- class [gdcm::MovePatientRootQuery](#)  
*MovePatientRootQuery.*

### Namespaces

- namespace [gdcm](#)

## 11.516 gdcmMovePatientRootQuery.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMOVEPATIENTROOTQUERY_H
15 #define GDCMMOVEPATIENTROOTQUERY_H
16
17 #include "gdcmFindPatientRootQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT MovePatientRootQuery : public BaseRootQuery
22     {
23     public:
24         friend class QueryFactory;
25         MovePatientRootQuery();
26
27         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
28
29         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
30
31         bool ValidateQuery(bool inStrict = true) const override;
32
33         UIDs::TSName GetAbstractSyntaxUID() const override;
34     };
35 }
36 // end namespace gdcm
37 #endif // GDCMMOVEPATIENTROOTQUERY_H

```

## 11.517 gdcmMoveStudyRootQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmMoveStudyRootQuery.h:

### Classes

- class [gdcm::MoveStudyRootQuery](#)  
*MoveStudyRootQuery.*

### Namespaces

- namespace [gdcm](#)

## 11.518 gdcmMoveStudyRootQuery.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMMOVESTUDYROOTQUERY_H
15 #define GDCMMOVESTUDYROOTQUERY_H
16
17 #include "gdcmBaseRootQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT MoveStudyRootQuery : public BaseRootQuery
22     {
23     public:
24         friend class QueryFactory;
25         MoveStudyRootQuery();
26         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
27         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
28         bool ValidateQuery(bool inStrict = true) const override;
29         UIDs::TSName GetAbstractSyntaxUID() const override;
30     };
31 } // end namespace gdcm
32
33 #endif // GDCMMOVESTUDYROOTQUERY_H

```

## 11.519 gdcmNActionMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNActionMessages.h:

### Classes

- class [gdcm::network::NActionRQ](#)  
*NActionRQ.*
- class [gdcm::network::NActionRSP](#)  
*NActionRSP this file defines the messages for the NAction action.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.520 gdcmNActionMessages.h

[Go to the documentation of this file.](#)

```

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2
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8
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCNACTIONMESSAGES_H
15 #define GDCMCNACTIONMESSAGES_H
16
17 #include "gdcmBaseNormalizedMessage.h"
18
19 namespace gdcm{
20     namespace network{
21
22     class ULConnection;
23
24     class NActionRQ : public BaseNormalizedMessage {
25     public:
26         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
27             const BaseQuery* inQuery) override;
28     };
29
30     class NActionRSP : public BaseNormalizedMessage {
31     public:
32         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
33     };
34 }
35
36 #endif // GDCMCNACTIONMESSAGES_H

```

## 11.521 gdcmNCreateMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNCreateMessages.h:

### Classes

- class [gdcm::network::NCreateRQ](#)  
*NCreateRQ.*
- class [gdcm::network::NCreateRSP](#)  
*NCreateRSP this file defines the messages for the ncreate action.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.522 gdcmNCreateMessages.h

[Go to the documentation of this file.](#)

```

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8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCNCREATEMESSAGES_H
15 #define GDCMCNCREATEMESSAGES_H
16
17 #include "gdcmBaseNormalizedMessage.h"
18
19 namespace gdcm{
20     namespace network{
21
22     class ULConnection;
23
24     class NCreateRQ : public BaseNormalizedMessage {
25     public:
26         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
27             const BaseQuery* inQuery) override;
28     };
29
30     class NCreateRSP : public BaseNormalizedMessage {
31     public:
32         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
33     };
34 }
35
36 #endif // GDCMCNCREATEMESSAGES_H

```

## 11.523 gdcmNDeleteMessages.h File Reference

```
#include "gdcmBaseNormalizedMessage.h"
```

Include dependency graph for gdcmNDeleteMessages.h:

### Classes

- class [gdcm::network::NDeleteRQ](#)  
*NDeleteRQ.*
- class [gdcm::network::NDeleteRSP](#)  
*NDeleteRSP* this file defines the messages for the ndelete action.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)



## 11.524 gdcmNDeleteMessages.h

[Go to the documentation of this file.](#)

```

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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCNDELETEMESSAGES_H
15 #define GDCMCNDELETEMESSAGES_H
16
17 #include "gdcmBaseNormalizedMessage.h"
18
19 namespace gdcm{
20     namespace network{
21
22     class ULConnection;
23
24     class NDeleteRQ : public BaseNormalizedMessage {
25     public:
26         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
27             const BaseQuery* inQuery) override;
28     };
29
30     class NDeleteRSP : public BaseNormalizedMessage {
31     public:
32         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
33     };
34 }
35 }
36 #endif // GDCMCNDELETEMESSAGES_H

```

## 11.525 gdcmNetworkEvents.h File Reference

This graph shows which files directly or indirectly include this file:

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

### Enumerations

- enum [gdcm::network::EEventID](#) {  
[gdcm::network::eAASSOCIATERequestLocalUser](#) = 0 ,  
[gdcm::network::eTransportConnConfirmLocal](#) ,  
[gdcm::network::eASSOCIATE\\_ACPDUreceived](#) ,  
[gdcm::network::eASSOCIATE\\_RJPDUreceived](#) ,  
[gdcm::network::eTransportConnIndicLocal](#) ,  
[gdcm::network::eAASSOCIATE\\_RQPDUreceived](#) ,  
[gdcm::network::eAASSOCIATEResponseAccept](#) ,  
[gdcm::network::eAASSOCIATEResponseReject](#) ,

```

gdcmm::network::ePDATArequest ,
gdcmm::network::ePDATATFPDU ,
gdcmm::network::eARELEASERequest ,
gdcmm::network::eARELEASE_RQPDUReceivedOpen ,
gdcmm::network::eARELEASE_RPPDUReceived ,
gdcmm::network::eARELEASEResponse ,
gdcmm::network::eAABORTRequest ,
gdcmm::network::eAABORTPDUReceivedOpen ,
gdcmm::network::eTransportConnectionClosed ,
gdcmm::network::eARTIMTimerExpired ,
gdcmm::network::eUnrecognizedPDUReceived ,
gdcmm::network::eEventDoesNotExist }

```

## Variables

- `const int gdcmm::network::cMaxEventID = eEventDoesNotExist`

## 11.526 gdcmmNetworkEvents.h

[Go to the documentation of this file.](#)

```

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2  *
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8  *
9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 /*
19 The NetworkEvents enumeration defines the inputs into the state of the network connection.
20
21 These inputs can come either from user input or input from other things on the socket,
22 ie, responses from the peer or ARTIM timeouts.
23
24 Note that this enumeration is not 'power of two', like the states, because you can't have
25 multiple simultaneous events.   Multiple state outputs in transition tables, however, is possible.
26
27 */
28 #ifndef GDCMMNETWORKEVENTS_H
29 #define GDCMMNETWORKEVENTS_H
30
31 namespace gdcmm {
32     namespace network {
33         typedef enum {
34             eAASSOCIATERequestLocalUser = 0,
35             eTransportConnConfirmLocal,
36             eASSOCIATE_ACPDUreceived,
37             eASSOCIATE_RJPDUreceived,
38             eTransportConnIndicLocal,
39             eAASSOCIATE_RQPDUreceived,
40             eAASSOCIATEResponseAccept,
41             eAASSOCIATEResponseReject,
42             ePDATArequest,
43             ePDATATFPDU,
44             eARELEASERequest,
45             eARELEASE_RQPDUReceivedOpen,

```

```

46     eARELEASE_RPPDUReceived,
47     eARELEASEResponse,
48     eAABORTRequest,
49     eAABORTPDUReceivedOpen,
50     eTransportConnectionClosed,
51     eARTIMTimerExpired,
52     eUnrecognizedPDUReceived,
53     eEventDoesNotExist
54 } EEventID;
55
56 const int cMaxEventID = eEventDoesNotExist;
57 }
58 }
59
60 #endif //NETWORKEVENTS_H

```

## 11.527 gdcNetworkStateID.h File Reference

This graph shows which files directly or indirectly include this file:

### Namespaces

- namespace [gdc](#)
- namespace [gdc::network](#)

### Enumerations

- enum [gdc::network::EStateID](#) {  
[gdc::network::eStaDoesNotExist](#) = 0 ,  
[gdc::network::eSta1Idle](#) = 1 ,  
[gdc::network::eSta2Open](#) = 2 ,  
[gdc::network::eSta3WaitLocalAssoc](#) = 4 ,  
[gdc::network::eSta4LocalAssocDone](#) = 8 ,  
[gdc::network::eSta5WaitRemoteAssoc](#) = 16 ,  
[gdc::network::eSta6TransferReady](#) = 32 ,  
[gdc::network::eSta7WaitRelease](#) = 64 ,  
[gdc::network::eSta8WaitLocalRelease](#) = 128 ,  
[gdc::network::eSta9ReleaseCollisionRqLocal](#) = 256 ,  
[gdc::network::eSta10ReleaseCollisionAc](#) = 512 ,  
[gdc::network::eSta11ReleaseCollisionRq](#) = 1024 ,  
[gdc::network::eSta12ReleaseCollisionAcLocal](#) = 2048 ,  
[gdc::network::eSta13AwaitingClose](#) = 4096 }

### Functions

- int [gdc::network::GetStateIndex](#) (EStateID inState)

### Variables

- const int [gdc::network::cMaxStateID](#) = 13

## 11.528 gdcmNetworkStateID.h

[Go to the documentation of this file.](#)

```

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13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMNETWORKSTATEID_H
19 #define GDCMNETWORKSTATEID_H
20
21 namespace gdcm {
22     namespace network {
23
24         enum EStateID {
25             eStaDoesNotExist = 0,
26             eStaIdle = 1,
27             eSta2Open = 2,
28             eSta3WaitLocalAssoc = 4,
29             eSta4LocalAssocDone = 8,
30             eSta5WaitRemoteAssoc = 16,
31             eSta6TransferReady = 32,
32             eSta7WaitRelease = 64,
33             eSta8WaitLocalRelease = 128,
34             eSta9ReleaseCollisionRqLocal = 256,
35             eSta10ReleaseCollisionAc = 512,
36             eSta11ReleaseCollisionRq = 1024,
37             eSta12ReleaseCollisionAcLocal = 2048,
38             eSta13AwaitingClose = 4096
39         };
40
41         const int cMaxStateID = 13;
42
43         //the transition table is built on state indices
44         //this function will produce the index from the power-of-two EStateID
45         inline int GetStateIndex(EStateID inState){
46             switch (inState){
47                 case eStaDoesNotExist:
48                     default:
49                         return -1;
50                 case eStaIdle:
51                     return 0;
52                 case eSta2Open:
53                     return 1;
54                 case eSta3WaitLocalAssoc:
55                     return 2;
56                 case eSta4LocalAssocDone:
57                     return 3;
58                 case eSta5WaitRemoteAssoc:
59                     return 4;
60                 case eSta6TransferReady:
61                     return 5;
62                 case eSta7WaitRelease:
63                     return 6;
64                 case eSta8WaitLocalRelease:
65                     return 7;
66                 case eSta9ReleaseCollisionRqLocal:
67                     return 8;
68                 case eSta10ReleaseCollisionAc:
69                     return 9;
70                 case eSta11ReleaseCollisionRq:
71                     return 10;
72                 case eSta12ReleaseCollisionAcLocal:
73                     return 11;
74                 case eSta13AwaitingClose:
75                     return 12;
76             }
77         }
78     }
79 }

```

```

85     }
86 }
87 }
88
89 #endif //GDCMNETWORKSTATEID_H

```

## 11.529 gdcmNEventReportMessages.h File Reference

#include "gdcmBaseNormalizedMessage.h"  
 Include dependency graph for gdcmNEventReportMessages.h:

### Classes

- class [gdcm::network::NEventReportRQ](#)  
[NEventReportRQ](#).
- class [gdcm::network::NEventReportRSP](#)  
[NEventReportRSP](#) this file defines the messages for the neventreport action.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.530 gdcmNEventReportMessages.h

[Go to the documentation of this file.](#)

```

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2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCNEVENTREPORTMESSAGES_H
15 #define GDCMCNEVENTREPORTMESSAGES_H
16
17 #include "gdcmBaseNormalizedMessage.h"
18
19 namespace gdcm{
20     namespace network{
21
22     class ULConnection;
23
24     class NEventReportRQ : public BaseNormalizedMessage {
25     public:
26         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
27             const BaseQuery* inQuery) override;
28     };
29
30     class NEventReportRSP : public BaseNormalizedMessage {
31     public:
32         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
33     };
34     }
35 }
36
37 #endif // GDCMCNEVENTREPORTMESSAGES_H

```

## 11.531 gdcmNGetMessages.h File Reference

#include "gdcmBaseNormalizedMessage.h"

Include dependency graph for gdcmNGetMessages.h:

### Classes

- class [gdcm::network::NGetRQ](#)  
[NGetRQ](#).
- class [gdcm::network::NGetRSP](#)  
[NGetRSP](#) this file defines the messages for the nget action.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.532 gdcmNGetMessages.h

[Go to the documentation of this file.](#)

```

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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCNGETMESSAGES_H
15 #define GDCMCNGETMESSAGES_H
16
17 #include "gdcmBaseNormalizedMessage.h"
18
19 namespace gdcm{
20     namespace network{
21
22     class ULConnection;
23
24     class NGetRQ : public BaseNormalizedMessage {
25     public:
26         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,
27             const BaseQuery* inQuery) override;
28     };
29
30     class NGetRSP : public BaseNormalizedMessage {
31     public:
32         std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
33     };
34     }
35 }
36 #endif // GDCMCNGETMESSAGES_H

```

## 11.533 gdcmNormalizedMessageFactory.h File Reference

```
#include "gdcmPresentationDataValue.h"
#include "gdcmULConnection.h"
Include dependency graph for gdcmNormalizedMessageFactory.h:
```

### Classes

- class [gdcm::network::NormalizedMessageFactory](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.534 gdcmNormalizedMessageFactory.h

[Go to the documentation of this file.](#)

```
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMNORMALIZEDMESSAGEFACTORY_H
15 #define GDCMNORMALIZEDMESSAGEFACTORY_H
16
17 #include "gdcmPresentationDataValue.h"
18 #include "gdcmULConnection.h"
19
20 namespace gdcm {
21     class BaseQuery;
22     class File;
23     namespace network {
24         class BasePDU;
25
26     class NormalizedMessageFactory
27     {
28     public:
29         static std::vector<PresentationDataValue> ConstructNEventReport (const ULConnection& inConnection,
30             const BaseQuery* inQuery);
31         static std::vector<PresentationDataValue> ConstructNGet (const ULConnection& inConnection, const
32             BaseQuery* inQuery);
33         static std::vector<PresentationDataValue> ConstructNSet (const ULConnection& inConnection, const
34             BaseQuery* inQuery);
35         static std::vector<PresentationDataValue> ConstructNAction (const ULConnection& inConnection, const
36             BaseQuery* inQuery);
37         static std::vector<PresentationDataValue> ConstructNCreate (const ULConnection& inConnection, const
38             BaseQuery* inQuery);
39         static std::vector<PresentationDataValue> ConstructNDelete (const ULConnection& inConnection, const
40             BaseQuery* inQuery);
41     };
42 }
43
44 #endif // GDCMNORMALIZEDMESSAGEFACTORY_H
```

## 11.535 gdcmNormalizedNetworkFunctions.h File Reference

```
#include "gdcmDirectory.h"
#include "gdcmBaseQuery.h"
#include <vector>
#include <string>
```

Include dependency graph for gdcmNormalizedNetworkFunctions.h:

### Classes

- class [gdcm::NormalizedNetworkFunctions](#)  
*Normalized Network Functions.*

### Namespaces

- namespace [gdcm](#)

## 11.536 gdcmNormalizedNetworkFunctions.h

[Go to the documentation of this file.](#)

```
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2
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMNORMALIZEDNETWORKFUNCTIONS_H
15 #define GDCMNORMALIZEDNETWORKFUNCTIONS_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmBaseQuery.h" // EQueryLevel / EQueryType
19
20 #include <vector>
21 #include <string>
22
23 namespace gdcm
24 {
25     class GDCM_EXPORT NormalizedNetworkFunctions
26     {
27     public:
28         static BaseQuery* ConstructQuery( const std::string & sopInstanceUID,
29                                           const DataSet& queryds, ENQueryType queryType = eCreateMMPS );
30         static bool NEventReport( const char *remote, uint16_t portno,
31                                   const BaseQuery* query, std::vector<DataSet> &retDataSets,
32                                   const char *aetitle, const char *call );
33         static bool NGet( const char *remote, uint16_t portno,
34                           const BaseQuery* query, std::vector<DataSet> &retDataSets,
35                           const char *aetitle, const char *call );
36         static bool NSet( const char *remote, uint16_t portno,
37                           const BaseQuery* query, std::vector<DataSet> &retDataSets,
38                           const char *aetitle, const char *call );
39         static bool NAction( const char *remote, uint16_t portno,
40                              const BaseQuery* query, std::vector<DataSet> &retDataSets,
41                              const char *aetitle, const char *call );
42         static bool NCreate( const char *remote, uint16_t portno,
```



```

64         BaseQuery* query, std::vector<DataSet> &retDataSets,
65         const char *aetitle, const char *call );
66 static bool NDelete( const char *remote, uint16_t portno,
67         const BaseQuery* query, std::vector<DataSet> &retDataSets,
68         const char *aetitle, const char *call );
69 };
70
71 } // end namespace gdcm
72
73 #endif // GDCMCOMPOSITENETWORKFUNCTIONS_H

```

## 11.537 gdcmNSetMessages.h File Reference

#include "gdcmBaseNormalizedMessage.h"  
 Include dependency graph for gdcmNSetMessages.h:

### Classes

- class [gdcm::network::NSetRQ](#)  
[NSetRQ](#).
- class [gdcm::network::NSetRSP](#)  
[NSetRSP](#) this file defines the messages for the nset action.

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.538 gdcmNSetMessages.h

[Go to the documentation of this file.](#)

```

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2
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9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMCNSETMESSAGES_H
15 #define GDCMCNSETMESSAGES_H
16
17 #include "gdcmBaseNormalizedMessage.h"
18
19 namespace gdcm{
20     namespace network{
21
22     class ULConnection;
23
24     class NSetRQ : public BaseNormalizedMessage {
25     public:
26         std::vector<PresentationDataValue> ConstructPDV(const ULConnection &inConnection,

```

```

31     const BaseQuery* inQuery) override;
32 };
33
34 class NSetRSP : public BaseNormalizedMessage {
35 public:
36     std::vector<PresentationDataValue> ConstructPDVByDataSet(const DataSet* inDataSet);
37 };
38 }
39 }
40 #endif // GDCMCNSETMESSAGES_H

```

## 11.539 gdcmPDataTFPDU.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmPresentationDataValue.h"
#include "gdcmBasePDU.h"
#include <limits>
Include dependency graph for gdcmPDataTFPDU.h:

```

### Classes

- class [gdcm::network::PDataTFPDU](#)  
*PDataTFPDU.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.540 gdcmPDataTFPDU.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPDATATFPDU_H
15 #define GDCMPDATATFPDU_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmPresentationDataValue.h"
19 #include "gdcmBasePDU.h"
20 #include <limits>
21
22 namespace gdcm
23 {
24
25 namespace network

```

```

26 {
27
33 class GDCM_EXPORT PDataTFPDU : public BasePDU
34 {
35 public:
36     PDataTFPDU();
37     std::istream &Read(std::istream &is) override;
38     const std::ostream &Write(std::ostream &os) const override;
39
41     size_t Size() const override;
42
43     void AddPresentationDataValue( PresentationDataValue const &pdv ) {
44         V.push_back( pdv );
45         assert( Size() < std::numeric_limits<uint32_t>::max() );
46         ItemLength = (uint32_t)Size() - 6;
47     }
48
49     typedef std::vector<PresentationDataValue>::size_type SizeType;
50     PresentationDataValue const &GetPresentationDataValue( SizeType i ) const {
51         assert( !V.empty() && i < V.size() );
52         return V[i];
53     }
54     SizeType GetNumberOfPresentationDataValues() const {
55         return V.size();
56     }
57
58     void Print(std::ostream &os) const override;
59     bool IsLastFragment() const override;
60
61 protected:
62     std::istream &ReadInto(std::istream &is, std::ostream &os);
63 private:
64     static const uint8_t ItemType; // PDUType ?
65     static const uint8_t Reserved2;
66     uint32_t ItemLength; // PDU Length ?
67     std::vector<PresentationDataValue> V;
68 };
69
70 } // end namespace network
71
72 } // end namespace gdcm
73
74 #endif //GDCMPDATATFPDU_H

```

## 11.541 gdcmPDUFactory.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmNetworkEvents.h"
#include "gdcmULConnection.h"
#include "gdcmPresentationDataValue.h"

```

Include dependency graph for gdcmPDUFactory.h:

### Classes

- class [gdcm::network::PDUFactory](#)  
*PDUFactory basically, given an initial byte, construct the.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.542 gdcmPDUFactory.h

[Go to the documentation of this file.](#)

```

1  /*=====
2  *
3  *   Copyright NumFOCUS
4  *
5  *   Licensed under the Apache License, Version 2.0 (the "License");
6  *   you may not use this file except in compliance with the License.
7  *   You may obtain a copy of the License at
8  *
9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMPDUFACTORY_H
19 #define GDCMPDUFACTORY_H
20
21 #include "gdcmTypes.h"
22 #include "gdcmNetworkEvents.h"
23 #include "gdcmULConnection.h"
24 #include "gdcmPresentationDataValue.h"
25
26 namespace gdcm{
27     class BaseRootQuery;
28     class BaseQuery;
29     class File;
30     namespace network{
31         class BasePDU;
32
33     public:
34         class PDUFactory {
35         public:
36             static BasePDU* ConstructPDU(uint8_t itemtype); //eventually needs to be smartpointer'd
37             static EEventID DetermineEventByPDU(const BasePDU* inPDU);
38             static BasePDU* ConstructReleasePDU();
39             static BasePDU* ConstructAbortPDU();
40
41             //these are the composite PDU construction methods for the PDataPDUs.
42             //basically, builds a pdatapdu, and then puts the appropriate information in
43             //for the appropriate composite service (c-echo, c-find, c-store, c-get, c-move)
44             //the connection is necessary to construct the stream of PDVs that will
45             //be then placed into the vector of PDUs
46             static std::vector<BasePDU*> CreateCEchoPDU(const ULConnection& inConnection);
47             static std::vector<BasePDU*> CreateCStoreRQPDU(const ULConnection& inConnection, const File &file, bool
writeDataSet = true );
48             static std::vector<BasePDU*> CreateCStoreRSPDU(const DataSet *inDataSet, const BasePDU* inPC);
49             static std::vector<BasePDU*> CreateCFindPDU(const ULConnection& inConnection, const BaseRootQuery*
inRootQuery);
50             static std::vector<BasePDU*> CreateCMovePDU(const ULConnection& inConnection, const BaseRootQuery*
inRootQuery);
51
52             static std::vector<BasePDU*> CreateNEventReportPDU (const ULConnection& inConnection, const BaseQuery
*inQuery);
53             static std::vector<BasePDU*> CreateNGetPDU      (const ULConnection& inConnection, const BaseQuery
*inQuery);
54             static std::vector<BasePDU*> CreateNSetPDU      (const ULConnection& inConnection, const BaseQuery
*inQuery);
55             static std::vector<BasePDU*> CreateNActionPDU    (const ULConnection& inConnection, const BaseQuery
*inQuery);
56             static std::vector<BasePDU*> CreateNCreatePDU   (const ULConnection& inConnection, const BaseQuery
*inQuery);
57             static std::vector<BasePDU*> CreateNDeletePDU   (const ULConnection& inConnection, const BaseQuery
*inQuery);
58
59             //given data pdus, produce the presentation data values stored within.
60             //all operations have these as the payload of the data sending operation
61             //however, echo does not have a dataset in the pdv.
62             static std::vector<PresentationDataValue> GetPDVs(const std::vector<BasePDU*> & inDataPDUs);
63         };
64     }
65 }
66
67 #endif //GDCMPDUFACTORY_H

```

## 11.543 gdcmPresentationContext.h File Reference

```
#include "gdcmTypes.h"
#include "gdcmUIDs.h"
#include <vector>
```

Include dependency graph for gdcmPresentationContext.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::PresentationContext](#)  
*PresentationContext.*

### Namespaces

- namespace [gdcm](#)

## 11.544 gdcmPresentationContext.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPRESENTATIONCONTEXT_H
15 #define GDCMPRESENTATIONCONTEXT_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmUIDs.h"
19
20 #include <vector>
21
22 namespace gdcm
23 {
24
25 class GDCM_EXPORT PresentationContext
26 {
27 public:
28     PresentationContext();
29
30     PresentationContext(UIDs::TSName asname,
31         UIDs::TSName tsname = UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM);
32
33     void SetAbstractSyntax(const char *absyn) { AbstractSyntax = absyn; }
34     const char *GetAbstractSyntax()const { return AbstractSyntax.c_str(); }
35
36     void AddTransferSyntax(const char *tsstr);
37     typedef std::vector<std::string> TransferSyntaxArrayType;
38     typedef TransferSyntaxArrayType::size_type SizeType;
39     const char *GetTransferSyntax(SizeType i)const { return TransferSyntaxes[i].c_str(); }
40     SizeType GetNumberOfTransferSyntaxes()const { return TransferSyntaxes.size(); }
41
42     void SetPresentationContextID(uint8_t id);
43
44 }
```

```

50  uint8_t GetPresentationContextID() const;
51
52  void Print(std::ostream &os) const;
53
54  bool operator==(const PresentationContext & pc) const
55  {
56      assert( TransferSyntaxes.size() == 1 ); // TODO
57      assert( pc.TransferSyntaxes.size() == 1 );
58      return AbstractSyntax == pc.AbstractSyntax && TransferSyntaxes == pc.TransferSyntaxes;
59  }
60
61 protected :
62  std::string AbstractSyntax;
63  std::vector<std::string> TransferSyntaxes;
64  uint8_t /*PresentationContext*/ID;
65 };
66
67 } // end namespace gdcm
68
69 #endif //GDCMPRESENTATIONCONTEXT_H

```

## 11.545 gdcmPresentationContextAC.h File Reference

```
#include "gdcmTypes.h"
```

```
#include "gdcmTransferSyntaxSub.h"
```

Include dependency graph for gdcmPresentationContextAC.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::PresentationContextAC](#)  
*PresentationContextAC.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.546 gdcmPresentationContextAC.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
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7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPRESENTATIONCONTEXTAC_H
15 #define GDCMPRESENTATIONCONTEXTAC_H
16
17 #include "gdcmTypes.h"

```

```

18 #include "gdcmTransferSyntaxSub.h"
19
20 namespace gdcm
21 {
22
23     namespace network
24     {
25
26         class PresentationContextAC
27         {
28         public:
29             PresentationContextAC();
30             std::istream &Read(std::istream &is);
31             const std::ostream &Write(std::ostream &os) const;
32
33             size_t Size() const;
34
35             void SetTransferSyntax( TransferSyntaxSub const &ts );
36             void SetPresentationContextID( uint8_t id );
37
38             void Print(std::ostream &os) const;
39
40             uint8_t GetPresentationContextID() const
41             {
42                 return ID;
43             }
44             TransferSyntaxSub const & GetTransferSyntax()const { return SubItems; }
45
46             void SetReason( uint8_t r ) { Result = r; }
47             uint8_t GetReason()const { return Result; }
48
49         private:
50             static const uint8_t ItemType;
51             static const uint8_t Reserved2;
52             uint16_t ItemLength; // len of last transfer syntax
53             uint8_t /*PresentationContext*/ID;
54             static const uint8_t Reserved6;
55             uint8_t /*Reason*/Result;
56             static const uint8_t Reserved8;
57             TransferSyntaxSub SubItems;
58         };
59     }
60 } // end namespace network
61 } // end namespace gdcm
62
63 #endif //GDCMPRESENTATIONCONTEXTAC_H

```

## 11.547 gdcmPresentationContextGenerator.h File Reference

```

#include "gdcmDirectory.h"
#include "gdcmPresentationContext.h"

```

Include dependency graph for gdcmPresentationContextGenerator.h:

### Classes

- class [gdcm::PresentationContextGenerator](#)  
*PresentationContextGenerator.*

### Namespaces

- namespace [gdcm](#)

## 11.548 gdcmPresentationContextGenerator.h

[Go to the documentation of this file.](#)

```

1  /*****
2
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11 PURPOSE.  See the above copyright notice for more information.
12
13 *****/
14 #ifndef GDCMPRESENTATIONCONTEXTGENERATOR_H
15 #define GDCMPRESENTATIONCONTEXTGENERATOR_H
16
17 #include "gdcmDirectory.h"
18 #include "gdcmPresentationContext.h"
19
20 namespace gdcm
21 {
22     class TransferSyntax;
23     class File;
24
25     class GDCM_EXPORT PresentationContextGenerator
26     {
27     public:
28         PresentationContextGenerator();
29
30         // Set MergeMode
31         // Default mode, each pair AbstractSyntax/TransferSyntax are only merged when
32         // exactly identical
33         void SetMergeModeToAbstractSyntax();
34
35         // Set MergeMode
36         // Merge is done on a per AbstractSyntax basis. Any new TransferSyntax for a
37         // given AbstractSyntax is merge to the existing PresentationContext referring
38         // to that AbstractSyntax
39         void SetMergeModeToTransferSyntax();
40
41         bool GenerateFromUID(UIDs::TSName asname);
42
43         bool GenerateFromFileNames(const Directory::FileNamesType &files);
44
45         bool AddFromFile(const File &file);
46
47         typedef std::vector<PresentationContext> PresentationContextArrayType;
48         typedef PresentationContextArrayType::size_type SizeType;
49         PresentationContextArrayType const &GetPresentationContexts() { return PresContext; }
50
51         void SetDefaultTransferSyntax( const TransferSyntax &ts );
52     protected:
53         bool AddPresentationContext( const char *absyn, const char *ts );
54         const char *GetDefaultTransferSyntax() const;
55     private:
56         std::vector<PresentationContext> PresContext;
57         static std::string DefaultTransferSyntax;
58     };
59 } // end namespace gdcm
60
61 #endif //GDCMPRESENTATIONCONTEXTGENERATOR_H

```

## 11.549 gdcmPresentationContextRQ.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmAbstractSyntax.h"
#include "gdcmTransferSyntaxSub.h"

```



```
#include "gdcmDataSet.h"
```

Include dependency graph for gdcmPresentationContextRQ.h: This graph shows which files directly or indirectly include this file:

## Classes

- class `gdcm::network::PresentationContextRQ`  
*PresentationContextRQ.*

## Namespaces

- namespace `gdcm`
- namespace `gdcm::network`

## 11.550 gdcmPresentationContextRQ.h

[Go to the documentation of this file.](#)

```
1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPRESENTATIONCONTEXTRO_H
15 #define GDCMPRESENTATIONCONTEXTRO_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmAbstractSyntax.h"
19 #include "gdcmTransferSyntaxSub.h"
20 #include "gdcmDataSet.h"
21
22 namespace gdcm
23 {
24 class PresentationContext;
25 namespace network
26 {
27
28 class GDCM_EXPORT PresentationContextRQ
29 {
30 public:
31     PresentationContextRQ();
32
33     PresentationContextRQ(UIDs::TSName asname, UIDs::TSName tsname =
34         UIDs::ImplicitVRLittleEndianDefaultTransferSyntaxforDICOM );
35
36     std::istream &Read(std::istream &is);
37     const std::ostream &Write(std::ostream &os) const;
38     size_t Size() const;
39
40     void SetAbstractSyntax( AbstractSyntax const &absyn );
41     AbstractSyntax const &GetAbstractSyntax()const { return SubItems; }
42     AbstractSyntax &GetAbstractSyntax() { return SubItems; }
43
44     void AddTransferSyntax( TransferSyntaxSub const &ts );
45     typedef std::vector<TransferSyntaxSub>::size_type SizeType;
46     TransferSyntaxSub const &GetTransferSyntax(SizeType i)const { return TransferSyntaxes[i]; }
47     TransferSyntaxSub &GetTransferSyntax(SizeType i) { return TransferSyntaxes[i]; }
```

```

57  std::vector<TransferSyntaxSub> const & GetTransferSyntaxes()const {return TransferSyntaxes; }
58  SizeType GetNumberOfTransferSyntaxes()const { return TransferSyntaxes.size(); }
59
60  void SetPresentationContextID( uint8_t id );
61  uint8_t GetPresentationContextID() const;
62
63  void Print(std::ostream &os) const;
64
65  bool operator==(const PresentationContextRQ & pc)const
66  {
67      assert( TransferSyntaxes.size() == 1 ); // TODO
68      assert( pc.TransferSyntaxes.size() == 1 );
69      return SubItems == pc.SubItems && TransferSyntaxes == pc.TransferSyntaxes;
70  }
71
72  PresentationContextRQ(const PresentationContext & pc);
73
74 private:
75  static const uint8_t ItemType;
76  static const uint8_t Reserved2;
77  uint16_t ItemLength; // len of last transfer syntax
78  uint8_t /*PresentationContext*/ID;
79  static const uint8_t Reserved6;
80  static const uint8_t Reserved7;
81  static const uint8_t Reserved8;
82  /*
83  This variable field shall contain the following sub-items: one Abstract
84  Syntax and one or more Transfer Syntax(es). For a complete
85  description of the use and encoding of these sub-items see Sections
86  9.3.2.2.1 and 9.3.2.2.2.
87  */
88  AbstractSyntax SubItems;
89  std::vector<TransferSyntaxSub> TransferSyntaxes;
90 };
91
92 } // end namespace network
93
94 } // end namespace gdcm
95
96 #endif //GDCMPRESENTATIONCONTEXTRO_H

```

## 11.551 gdcmPresentationDataValue.h File Reference

```
#include "gdcmTypes.h"
```

```
#include <vector>
```

Include dependency graph for gdcmPresentationDataValue.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::PresentationDataValue](#)  
*PresentationDataValue.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.552 gdcmPresentationDataValue.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPRESENTATIONDATAVALUE_H
15 #define GDCMPRESENTATIONDATAVALUE_H
16
17 #include "gdcmTypes.h"
18
19 #include <vector>
20
21 namespace gdcm
22 {
23 class DataSet;
24 namespace network
25 {
26
27 class GDCM_EXPORT PresentationDataValue
28 {
29 public:
30     PresentationDataValue();
31     std::istream &Read(std::istream &is);
32     std::istream &ReadInto(std::istream &is, std::ostream &os);
33
34     const std::ostream &Write(std::ostream &os) const;
35
36     size_t Size() const;
37
38     void SetDataSet(const DataSet &ds);
39     void SetBlob(const std::string & partialblob);
40     const std::string &GetBlob() const;
41
42     uint8_t GetPresentationContextID()const { return PresentationContextID; }
43     void SetPresentationContextID(uint8_t id) {
44         assert( id );
45         PresentationContextID = id;
46     }
47     uint8_t GetMessageHeader()const {
48         assert( MessageHeader <= 0x3 );
49         return MessageHeader;
50     }
51     // E.2 MESSAGE CONTROL HEADER ENCODING
52     // Only the first two bits are considered
53     void SetMessageHeader(uint8_t messageheader) {
54         MessageHeader = messageheader;
55         assert( MessageHeader <= 0x3 );
56     }
57     //flip the least significant bit of the message header to 1
58     //if this is a command, else set it to 0.
59     void SetCommand(bool inCommand);
60     void SetLastFragment(bool inLast); //set to true if this is the last PDV of a set
61
62     bool GetIsCommand() const;
63     bool GetIsLastFragment() const;
64
65     void Print(std::ostream &os) const;
66
67     //NOTE that the PDVs have to be given in the order in which they were received!
68     //also note that a dataset may be across multiple PDVs
69     static DataSet ConcatenatePDVBlobs(const std::vector<PresentationDataValue>& inPDVs);
70
71     static DataSet ConcatenatePDVBlobsAsExplicit(const std::vector<PresentationDataValue>& inPDVs);
72
73 private:
74     uint32_t ItemLength;
75     uint8_t PresentationContextID;
76     uint8_t MessageHeader;
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```

```

86     std::string Blob;
87 };
88 } // end namespace network
89
90 } // end namespace gdcm
91
92 #endif //GDCMPRESENTATIONDATAVALUE_H

```

## 11.553 gdcmQueryBase.h File Reference

```

#include "gdcmTag.h"
#include "gdcmDataElement.h"
#include <vector>

```

Include dependency graph for gdcmQueryBase.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::QueryBase](#)  
*QueryBase.*

### Namespaces

- namespace [gdcm](#)

### Enumerations

- enum [gdcm::ERootType](#) {  
    [gdcm::ePatientRootType](#) ,  
    [gdcm::eStudyRootType](#) }

## 11.554 gdcmQueryBase.h

[Go to the documentation of this file.](#)

```

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2  *
3  *   Copyright NumFOCUS
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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
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11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMQUERYBASE_H
19 #define GDCMQUERYBASE_H
20

```

```

21 #include "gdcmTag.h"
22 #include "gdcmDataElement.h"
23
24 #include <vector>
25
26 namespace gdcm
27 {
28     enum ERootType
29     {
30         ePatientRootType,
31         eStudyRootType
32     };
33
34     class GDCM_EXPORT QueryBase
35     {
36     public:
37         virtual ~QueryBase() = default;
38
39         virtual std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const = 0;
40         virtual std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const = 0;
41         virtual std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const = 0;
42         // C.4.1.2.1 Baseline Behavior of SCU
43         // All C-FIND SCUs shall be capable of generating query requests which
44         // meet the requirements of the Hierarchical Search.
45         // The Identifier contained in a C-FIND request shall contain a single
46         // value in the Unique Key Attribute for each level above the
47         // Query/Retrieve level. No Required or Optional Keys shall be
48         // specified which are associated with levels above the Query/Retrieve
49         // level.
50         virtual std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const = 0;
51
52         std::vector<Tag> GetAllTags(const ERootType& inRootType) const;
53
54         std::vector<Tag> GetAllRequiredTags(const ERootType& inRootType) const;
55
56         virtual const char * GetName() const = 0;
57         virtual DataElement GetQueryLevel() const = 0;
58     };
59 }
60 #endif //GDCMQUERYBASE_H

```

## 11.555 gdcmQueryFactory.h File Reference

#include "gdcmBaseRootQuery.h"  
 Include dependency graph for gdcmQueryFactory.h:

### Classes

- class [gdcm::QueryFactory](#)  
*QueryFactory.h.*

### Namespaces

- namespace [gdcm](#)

## Enumerations

- enum `gdcmm::ECharSet` {  
`gdcmm::eLatin1` = 0 ,  
`gdcmm::eLatin2` ,  
`gdcmm::eLatin3` ,  
`gdcmm::eLatin4` ,  
`gdcmm::eCyrillic` ,  
`gdcmm::eArabic` ,  
`gdcmm::eGreek` ,  
`gdcmm::eHebrew` ,  
`gdcmm::eLatin5` ,  
`gdcmm::eJapanese` ,  
`gdcmm::eThai` ,  
`gdcmm::eJapaneseKanjiMultibyte` ,  
`gdcmm::eJapaneseSupplementaryKanjiMultibyte` ,  
`gdcmm::eKoreanHangulHanjaMultibyte` ,  
`gdcmm::eUTF8` ,  
`gdcmm::eGB18030` }

## 11.556 gdcmmQueryFactory.h

[Go to the documentation of this file.](#)

```
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7 *   You may obtain a copy of the License at
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9 *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMQUERYFACTORY_H
19 #define GDCMQUERYFACTORY_H
20
21 #include "gdcmmBaseRootQuery.h"
22
23 namespace gdcmm{
24     enum ECharSet {
25         eLatin1 = 0,
26         eLatin2,
27         eLatin3,
28         eLatin4,
29         eCyrillic,
30         eArabic,
31         eGreek,
32         eHebrew,
33         eLatin5, // Latin Alphabet No. 5 (Turkish) Extended
34         eJapanese, // JIS X 0201 (Shift JIS) Extended
35         eThai, // TIS 620-2533 (Thai) Extended
36         eJapaneseKanjiMultibyte, // JIS X 0208 (Kanji) Extended
37         eJapaneseSupplementaryKanjiMultibyte, // JIS X 0212 (Kanji) Extended
38         eKoreanHangulHanjaMultibyte, // KS X 1001 (Hangul and Hanja) Extended
39         eUTF8,
40         eGB18030 // Chinese (Simplified) Extended
41     };
42
43     class GDCM_EXPORT QueryFactory
```

```

59 {
60 public:
61
62     static BaseQuery* ProduceQuery( const std::string & sopInstanceUID, ENQueryType inQueryType );
63     static BaseRootQuery* ProduceQuery(ERootType inRootType, EQueryType inQueryType,
64         EQueryLevel inQueryLevel);
65
66     static DataElement ProduceCharacterSetDataElement(
67         const std::vector<ECharSet>& inCharSetType);
68
69     static ECharSet GetCharacterFromCurrentLocale();
70
71     static void ListCharSets(std::ostream& os);
72 };
73
74 // end namespace gdcm
75
76 #endif // GDCMQUERYFACTORY_H

```

## 11.557 gdcmQueryImage.h File Reference

```

#include "gdcmQueryBase.h"
#include "gdcmDataSet.h"

```

Include dependency graph for gdcmQueryImage.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::QueryImage](#)  
*QueryImage*.

### Namespaces

- namespace [gdcm](#)

## 11.558 gdcmQueryImage.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMQUERYIMAGE_H
19 #define GDCMQUERYIMAGE_H
20
21 #include "gdcmQueryBase.h"
22 #include "gdcmDataSet.h"

```

```

23
24 namespace gdcmm
25 {
26 class GDCM_EXPORT QueryImage : public QueryBase
27 {
28 public:
29     std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const override;
30     std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const override;
31     std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const override;
32     std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const override;
33
34     const char * GetName() const override;
35
36     DataElement GetQueryLevel() const override;
37 };
38 } // end namespace gdcmm
39
40 #endif // GDCMQUERYIMAGE_H

```

## 11.559 gdcmmQueryPatient.h File Reference

#include "gdcmmQueryBase.h"

Include dependency graph for gdcmmQueryPatient.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcmm::QueryPatient](#)  
*QueryPatient.*

### Namespaces

- namespace [gdcmm](#)

## 11.560 gdcmmQueryPatient.h

[Go to the documentation of this file.](#)

```

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12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMQUERYPATIENT_H
19 #define GDCMQUERYPATIENT_H
20
21 #include "gdcmmQueryBase.h"
22

```



```

23 namespace gdcm
24 {
25     class GDCM_EXPORT QueryPatient : public QueryBase
26     {
27     public:
28         std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const override;
29         std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const override;
30         std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const override;
31         std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const override;
32
33         const char * GetName() const override;
34         DataElement GetQueryLevel() const override;
35     };
36 } // end namespace gdcm
37 #endif //GDCMQUERYPATIENT_H

```

## 11.561 gdcmQuerySeries.h File Reference

#include "gdcmQueryBase.h"

Include dependency graph for gdcmQuerySeries.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::QuerySeries](#)  
*QuerySeries.*

### Namespaces

- namespace [gdcm](#)

## 11.562 gdcmQuerySeries.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMQUERYSERIES_H
19 #define GDCMQUERYSERIES_H
20
21 #include "gdcmQueryBase.h"
22
23 namespace gdcm
24 {

```

```

29 class GDCM_EXPORT QuerySeries : public QueryBase
30 {
31 public:
32     std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const override;
33     std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const override;
34     std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const override;
35     std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const override;
36
37     const char * GetName() const override;
38     DataElement GetQueryLevel() const override;
39 };
40
41 } // end namespace gdcms
42
43 #endif //GDCMQUERYSERIES_H

```

## 11.563 gdcmsQueryStudy.h File Reference

#include "gdcmsQueryBase.h"

Include dependency graph for gdcmsQueryStudy.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcms::QueryStudy](#)  
*QueryStudy.h.*

### Namespaces

- namespace [gdcms](#)

## 11.564 gdcmsQueryStudy.h

[Go to the documentation of this file.](#)

```

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2 *
3 *   Copyright NumFOCUS
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9 *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMQUERYSTUDY_H
19 #define GDCMQUERYSTUDY_H
20
21 #include "gdcmsQueryBase.h"
22
23 namespace gdcms
24 {
25     class GDCM_EXPORT QueryStudy : public QueryBase
26     {

```

```

31 public:
32     std::vector<Tag> GetRequiredTags(const ERootType& inRootType) const override;
33     std::vector<Tag> GetUniqueTags(const ERootType& inRootType) const override;
34     std::vector<Tag> GetOptionalTags(const ERootType& inRootType) const override;
35     std::vector<Tag> GetHierarchicalSearchTags(const ERootType& inRootType) const override;
36
37     const char *GetName() const override;
38     DataElement GetQueryLevel() const override;
39 };
40
41 } // end namespace gdcm
42
43 #endif //GDCMQUERYSTUDY_H

```

## 11.565 gdcmRoleSelectionSub.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmRoleSelectionSub.h:

### Classes

- class [gdcm::network::RoleSelectionSub](#)  
*RoleSelectionSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.566 gdcmRoleSelectionSub.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMROLESELECTIONSUB_H
15 #define GDCMROLESELECTIONSUB_H
16
17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22     namespace network
23     {
24
25         class RoleSelectionSub
26         {
27         public:

```

```

34 RoleSelectionSub();
35 std::istream &Read(std::istream &is);
36 const std::ostream &Write(std::ostream &os) const;
37
38 size_t Size() const;
39 void Print(std::ostream &os) const;
40
41 void SetTuple(const char *uid, uint8_t scurole, uint8_t scprole);
42
43 private:
44 static const uint8_t ItemType;
45 static const uint8_t Reserved2;
46 uint16_t ItemLength;
47 uint16_t UIDLength;
48 std::string /*SOP-class-uid*/ Name; // UID
49 uint8_t SCURole;
50 uint8_t SCProle;
51 };
52
53 } // end namespace network
54
55 } // end namespace gdcms
56
57 #endif // GDCMSERVICECLASSAPPLICATIONINFORMATION_H

```

## 11.567 gdcmsServiceClassApplicationInformation.h File Reference

```
#include "gdcmsTypes.h"
```

Include dependency graph for gdcmsServiceClassApplicationInformation.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcms::network::ServiceClassApplicationInformation](#)

### Namespaces

- namespace [gdcms](#)
- namespace [gdcms::network](#)

## 11.568 gdcmsServiceClassApplicationInformation.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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8
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSERVICECLASSAPPLICATIONINFORMATION_H
15 #define GDCMSERVICECLASSAPPLICATIONINFORMATION_H
16

```

```

17 #include "gdcmTypes.h"
18
19 namespace gdcm
20 {
21
22 namespace network
23 {
24
25 class ServiceClassApplicationInformation
26 {
27 public:
28     ServiceClassApplicationInformation();
29     std::istream &Read(std::istream &is);
30     const std::ostream &Write(std::ostream &os) const;
31
32     size_t Size() const;
33     void SetTuple(uint8_t levelofsupport, uint8_t levelofdigitalsig,
34                  uint8_t elementcoercion);
35     void Print(std::ostream &os) const;
36 private:
37     uint8_t InternalArray[6];
38 };
39
40 } // end namespace network
41
42 } // end namespace gdcm
43
44 #endif //GDCMSERVICECLASSAPPLICATIONINFORMATION_H

```

## 11.569 gdcmServiceClassUser.h File Reference

```

#include "gdcmSubject.h"
#include "gdcmPresentationContext.h"
#include "gdcmFile.h"
#include "gdcmNetworkStateID.h"

```

Include dependency graph for gdcmServiceClassUser.h:

### Classes

- class [gdcm::ServiceClassUser](#)  
*ServiceClassUser.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.570 gdcmServiceClassUser.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
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```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSERVICECLASSUSER_H
15 #define GDCMSERVICECLASSUSER_H
16
17 #include "gdcmsubject.h"
18
19 #include "gdcmpresentationcontext.h"
20 #include "gdcmfile.h"
21
22 #include "gdcmnetworkstateid.h" // EStateID
23
24 namespace gdcms
25 {
26 class ServiceClassUserInternals;
27 class BaseRootQuery;
28 namespace network{
29 class ULEvent;
30 class ULConnection;
31 class ULConnectionCallback;
32 }
33
34 class GDCM_EXPORT ServiceClassUser : public Subject
35 {
36 public:
37     ServiceClassUser();
38     ~ServiceClassUser() override;
39     ServiceClassUser(const ServiceClassUser&) = delete;
40     void operator=(const ServiceClassUser &) = delete;
41
42     void SetHostname( const char *hostname );
43
44     void SetPort( uint16_t port );
45
46     void SetPortSCP( uint16_t portscp );
47
48     void SetAETitle(const char *aetitle);
49     const char *GetAETitle() const;
50
51     void SetCalledAETitle(const char *aetitle);
52     const char *GetCalledAETitle() const;
53
54     void SetTimeout(double t);
55     double GetTimeout() const;
56
57     bool InitializeConnection();
58
59     void SetPresentationContexts(std::vector<PresentationContext> const & pcs);
60
61     bool IsPresentationContextAccepted(const PresentationContext& pc) const;
62
63     bool StartAssociation();
64
65     bool StopAssociation();
66
67     bool SendEcho();
68
69     bool SendStore(const char *filename);
70     bool SendStore(File const &file);
71     bool SendStore(DataSet const &ds);
72
73     bool SendFind(const BaseRootQuery* query, std::vector<DataSet> &retDatasets);
74
75     bool SendMove(const BaseRootQuery* query, const char *outputdir);
76     bool SendMove(const BaseRootQuery* query, std::vector<DataSet> &retDatasets);
77     bool SendMove(const BaseRootQuery* query, std::vector<File> &retFile);
78
79     static SmartPointer<ServiceClassUser> New() { return new ServiceClassUser; }
80
81 private:
82     network::EStateID RunEventLoop(network::ULEvent& inEvent,
83                                     network::ULConnection* inWhichConnection,
84                                     network::ULConnectionCallback* inCallback, const bool& startWaiting);
85     network::EStateID RunMoveEventLoop(network::ULEvent& inEvent,
86                                         network::ULConnectionCallback* inCallback);
87
88 private:

```

```

117 ServiceClassUserInternals *Internals;
118 };
119
120 } // end namespace gdcm
121
122 #endif // GDCMSERVICECLASSUSER_H

```

## 11.571 gdcmSOPClassExtendedNegociationSub.h File Reference

#include "gdcmServiceClassApplicationInformation.h"

Include dependency graph for gdcmSOPClassExtendedNegociationSub.h:

### Classes

- class [gdcm::network::SOPClassExtendedNegociationSub](#)  
*SOPClassExtendedNegociationSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.572 gdcmSOPClassExtendedNegociationSub.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMSOPCLASSEXTENDEDNEGOCIATIONSUB_H
15 #define GDCMSOPCLASSEXTENDEDNEGOCIATIONSUB_H
16
17 #include "gdcmServiceClassApplicationInformation.h"
18
19 namespace gdcm
20 {
21     namespace network
22     {
23
24         class SOPClassExtendedNegociationSub
25         {
26         public:
27             SOPClassExtendedNegociationSub();
28             std::istream &Read(std::istream &is);
29             const std::ostream &Write(std::ostream &os) const;
30
31             size_t Size() const;
32             void Print(std::ostream &os) const;
33
34             void SetTuple(const char *uid, uint8_t levelofsupport = 3,

```

```

42     uint8_t levelofdigitalsig = 0,
43     uint8_t elementcoercion = 2);
44
45 private:
46     static const uint8_t ItemType;
47     static const uint8_t Reserved2;
48     uint16_t ItemLength;
49     uint16_t UIDLength;
50     std::string /*SOP-class-uid*/ Name; // UID
51     ServiceClassApplicationInformation SCAI;
52 };
53
54 } // end namespace network
55
56 } // end namespace gdcm
57
58 #endif // GDCMSOPCLASSEXTENDEDNEGOCIATIONSUB_H

```

## 11.573 gdcmTransferSyntaxSub.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDs.h"

```

Include dependency graph for gdcmTransferSyntaxSub.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::TransferSyntaxSub](#)  
*TransferSyntaxSub.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.574 gdcmTransferSyntaxSub.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMTRANSFERSYNTAXSUB_H
15 #define GDCMTRANSFERSYNTAXSUB_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmTransferSyntax.h"

```



```

19 #include "gdcmUIDs.h"
20
21 namespace gdcm
22 {
23
24 namespace network
25 {
26
27 class TransferSyntaxSub
28 {
29 public:
30     TransferSyntaxSub();
31     void SetName( const char *name );
32     const char *GetName() const { return Name.c_str(); }
33
34     // accept a UID::TSType also...
35     void SetNameFromUID( UID::TSType tsname );
36
37     std::istream &Read(std::istream &is);
38     const std::ostream &Write(std::ostream &os) const;
39     size_t Size() const;
40     void Print(std::ostream &os) const;
41
42     bool operator==(const TransferSyntaxSub & ts) const
43     {
44         return Name == ts.Name;
45     }
46
47 private:
48     void UpdateName( const char *name );
49     static const uint8_t ItemType;
50     static const uint8_t Reserved2;
51     uint16_t ItemLength; // len of
52     std::string /*TransferSyntaxSub*/ Name; // UID
53 };
54
55 } // end namespace network
56
57 } // end namespace gdcm
58
59 #endif //GDCMTRANSFERSYNTAXSUB_H

```

## 11.575 gdcmULAction.h File Reference

```

#include "gdcmNetworkStateID.h"
#include "gdcmULEvent.h"
#include "gdcmULConnection.h"

```

Include dependency graph for gdcmULAction.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ULAction](#)  
*ULAction.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.576 gdcmULAction.h

[Go to the documentation of this file.](#)

```

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11 * Unless required by applicable law or agreed to in writing, software
12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULACTION_H
19 #define GDCMULACTION_H
20
21 #include "gdcmNetworkStateID.h"
22 #include "gdcmULEvent.h"
23 #include "gdcmULConnection.h"
24
25 namespace gdcm {
26 class Subject;
27     namespace network {
28
29     class ULAction {
30     protected:
31
32     public:
33         ULAction() = default;
34         //make sure destructors are virtual to avoid memory leaks
35         virtual ~ULAction() = default;
36         //cannot copy a ULAction
37         ULAction(const ULAction& inAction) = delete;
38         void operator=(const ULAction&) = delete;
39
40         virtual EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
41             bool& outWaitingForEvent, EEventID& outRaisedEvent) = 0;
42     };
43 }
44
45 #endif // GDCMULACTION_H

```

## 11.577 gdcmULActionAA.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionAA.h:

### Classes

- class [gdcm::network::ULActionAA1](#)
- class [gdcm::network::ULActionAA2](#)
- class [gdcm::network::ULActionAA3](#)
- class [gdcm::network::ULActionAA4](#)
- class [gdcm::network::ULActionAA5](#)
- class [gdcm::network::ULActionAA6](#)
- class [gdcm::network::ULActionAA7](#)
- class [gdcm::network::ULActionAA8](#)

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.578 gdcmULActionAA.h

[Go to the documentation of this file.](#)

```

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13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULACTIONAA_H
19 #define GDCMULACTIONAA_H
20
21 #include "gdcmULAction.h"
22
23 namespace gdcm {
24     namespace network {
25
26         //Send A-ABORT PDU (service-user source) and start (or restart if already started) ARTIM timer
27         //Next State: eStal3AwaitingClose
28         class ULActionAA1 : public ULAction {
29         public:
30             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
31                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
32         };
33
34         //Stop ARTIM timer if running.      Close transport connection.
35         //Next State: eStalIdle
36         class ULActionAA2 : public ULAction {
37         public:
38             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
39                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
40         };
41
42         //If (service-user initiated abort)
43         //- issue A-ABORT indication and close transport connection
44         //- otherwise (service-provider initiated abort):
45         //- issue A-P-ABORT indication and close transport connection
46         //Next State: eStalIdle
47         class ULActionAA3 : public ULAction {
48         public:
49             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
50                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
51         };
52
53         //Issue A-P-ABORT indication primitive
54         //Next State: eStalIdle
55         class ULActionAA4 : public ULAction {
56         public:
57             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
58                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
59         };
60
61         //Stop ARTIM timer
62         //Next State: eStalIdle
63         class ULActionAA5 : public ULAction {
64         public:
65             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,

```

```

74         bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
75     };
76
77     //Ignore PDU
78     //Next State: eStal3AwaitingClose
79     class UActionAA6 : public UAction {
80     public:
81         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
82             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
83     };
84
85     //Send A-ABORT PDU
86     //Next State: eStal3AwaitingClose
87     class UActionAA7 : public UAction {
88     public:
89         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
90             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
91     };
92
93     //Send A-ABORT PDU (service-provider source), issue an A-P-ABORT indication, and start ARTIM timer
94     //Next State: eStal3AwaitingClose
95     class UActionAA8 : public UAction {
96     public:
97         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
98             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
99     };
100 }
101 }
102
103 #endif // GDCMULACTIONAA_H

```

## 11.579 gdcmULActionAE.h File Reference

#include "gdcmULAction.h"

Include dependency graph for gdcmULActionAE.h:

### Classes

- class [gdcm::network::ULActionAE1](#)
- class [gdcm::network::ULActionAE2](#)
- class [gdcm::network::ULActionAE3](#)
- class [gdcm::network::ULActionAE4](#)
- class [gdcm::network::ULActionAE5](#)
- class [gdcm::network::ULActionAE6](#)
- class [gdcm::network::ULActionAE7](#)
- class [gdcm::network::ULActionAE8](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.580 gdcMULActionAE.h

[Go to the documentation of this file.](#)

```

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13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULACTIONAE_H
19 #define GDCMULACTIONAE_H
20
21 #include "gdcMULAction.h"
22
23 namespace gdcM {
24     namespace network {
25
26         //Issue TRANSPORT CONNECT request primitive to local transport service.
27         class ULActionAE1 : public ULAction {
28         public:
29             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
30                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
31         };
32
33         //Send A-ASSOCIATE-RQ-PDU
34         //Next State: eSta5WaitRemoteAssoc
35         class ULActionAE2 : public ULAction {
36         public:
37             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
38                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
39         };
40
41         //Issue A-ASSOCIATE confirmation (accept) primitive
42         //Next State: eSta6TransferReady
43         class ULActionAE3 : public ULAction {
44         public:
45             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
46                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
47         };
48
49         //Issue A-ASSOCIATE confirmation (reject) primitive and close transport connection
50         //Next State: eStaIdle
51         class ULActionAE4 : public ULAction {
52         public:
53             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
54                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
55         };
56
57         //Issue Transport connection response primitive, start ARTIM timer
58         //Next State: eSta2Open
59         class ULActionAE5 : public ULAction {
60         public:
61             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
62                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
63         };
64
65         //Stop ARTIM timer and if A-ASSOCIATE-RQ acceptable by service-provider:
66         //- issue A-ASSOCIATE indication primitive
67         //Next state: eSta3WaitLocalAssoc
68         //otherwise:
69         //- issue A-ASSOCIATE-RJ-PDU and start ARTIM timer
70         //Next state: eSta13AwaitingClose
71         class ULActionAE6 : public ULAction {
72         public:
73             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
74                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
75         };
76
77     }
78 }

```

```

86     //Send A-ASSOCIATE-AC PDU
87     //Next State: eSta6TransferReady
88     class UActionAE7 : public UAction {
89     public:
90         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
91             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
92     };
93
94     //Send A-ASSOCIATE-RJ PDU and start ARTIM timer
95     //Next State: eSta13AwaitingClose
96     class UActionAE8 : public UAction {
97     public:
98         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
99             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
100     };
101 }
102 }
103 #endif // GDCMULACTIONAE_H

```

## 11.581 gdcmULActionAR.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionAR.h:

### Classes

- class [gdcm::network::UActionAR1](#)
- class [gdcm::network::UActionAR10](#)
- class [gdcm::network::UActionAR2](#)
- class [gdcm::network::UActionAR3](#)
- class [gdcm::network::UActionAR4](#)
- class [gdcm::network::UActionAR5](#)
- class [gdcm::network::UActionAR6](#)
- class [gdcm::network::UActionAR7](#)
- class [gdcm::network::UActionAR8](#)
- class [gdcm::network::UActionAR9](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.582 gdcmULActionAR.h

[Go to the documentation of this file.](#)

```

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```

```

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12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULACTIONAR_H
19 #define GDCMULACTIONAR_H
20
21 #include "gdcMULAction.h"
22
23 namespace gdcM {
24     namespace network {
25
26         //Send A-RELEASE-RQ-PDU
27         //Next State: eSta7WaitRelease
28         class ULAActionAR1 : public ULAAction {
29         public:
30             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
31                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
32         };
33
34         //Issue A-RELEASE indication primitive
35         //Next State: eSta8WaitLocalRelease
36         class ULAActionAR2 : public ULAAction {
37         public:
38             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
39                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
40         };
41
42         //Issue A-RELEASE confirmation primitive, and close transport connection
43         //Next State: eStaIdle
44         class ULAActionAR3 : public ULAAction {
45         public:
46             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
47                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
48         };
49
50         //Issue A-RELEASE-RP PDU and start ARTIM timer
51         //Next State: eSta13AwaitingClose
52         class ULAActionAR4 : public ULAAction {
53         public:
54             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
55                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
56         };
57
58         //Stop ARTIM timer
59         //Next State: eStaIdle
60         class ULAActionAR5 : public ULAAction {
61         public:
62             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
63                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
64         };
65
66         //Issue P-Data indication
67         //Next State: eSta7WaitRelease
68         class ULAActionAR6 : public ULAAction {
69         public:
70             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
71                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
72         };
73
74         //Issue P-DATA-TF PDU
75         //Next State: eSta8WaitLocalRelease
76         class ULAActionAR7 : public ULAAction {
77         public:
78             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
79                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
80         };
81
82         //Issue A-RELEASE indication (release collision):
83         // - If association-requestor, next state is eSta9ReleaseCollisionRqLocal
84         // - if not, next state is eSta10ReleaseCollisionAc
85         class ULAActionAR8 : public ULAAction {
86         public:
87             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
88                                     bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
89         };
90
91     }
92 }

```

```

99     //Send A-RELEASE-RP PDU
100     //Next State: eStallReleaseCollisionRq
101     class UActionAR9 : public UAction {
102     public:
103         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
104             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
105     };
106
107     //Issue A-RELEASE confirmation primitive
108     //Next State: eStal2ReleaseCollisionAcLocal
109     class UActionAR10 : public UAction {
110     public:
111         EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
112             bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
113     };
114 }
115 }
116 #endif // GDCMULACTIONAR_H

```

## 11.583 gdcmULActionDT.h File Reference

```
#include "gdcmULAction.h"
```

Include dependency graph for gdcmULActionDT.h:

### Classes

- class [gdcm::network::UActionDT1](#)
- class [gdcm::network::UActionDT2](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.584 gdcmULActionDT.h

[Go to the documentation of this file.](#)

```

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13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULACTIONDT_H
19 #define GDCMULACTIONDT_H
20
21 #include "gdcmULAction.h"
22

```



```

31 namespace gdcm {
32     namespace network {
33
34         //Send P-DATA-TF PDU
35         //Next state: eSta6TransferReady
36         class ULActionDT1 : public ULAction {
37         public:
38             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
39                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
40         };
41
42         //Send P-DATA indication primitive
43         //Next state: eSta6TransferReady
44         class ULActionDT2 : public ULAction {
45         public:
46             EStateID PerformAction(Subject *s, ULEvent& inEvent, ULConnection& inConnection,
47                 bool& outWaitingForEvent, EEventID& outRaisedEvent) override;
48         };
49     }
50 }
51 #endif // GDCMULACTIONDT_H

```

## 11.585 gdcmULBasicCallback.h File Reference

```

#include "gdcmULConnectionCallback.h"
#include "gdcmDataSet.h"
#include <vector>

```

Include dependency graph for gdcmULBasicCallback.h:

### Classes

- class [gdcm::network::ULBasicCallback](#)  
*ULBasicCallback.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.586 gdcmULBasicCallback.h

[Go to the documentation of this file.](#)

```

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13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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15 *   limitations under the License.
16 *

```

```

17 *=====*/
18 #ifndef GDCMULCONNECTIONBASICCALLBACK_H
19 #define GDCMULCONNECTIONBASICCALLBACK_H
20
21 #include "gdcmULConnectionCallback.h"
22 #include "gdcmDataSet.h"
23 #include <vector>
24
25 namespace gdcm
26 {
27     namespace network
28     {
29         class GDCM_EXPORT ULBasicCallback : public ULConnectionCallback
30         {
31         public:
32             ULBasicCallback() = default;
33             ~ULBasicCallback() override = default; //empty, for later inheritance
34
35             void HandleDataSet(const DataSet& inDataSet) override;
36             void HandleResponse(const DataSet& inDataSet) override;
37
38             std::vector<DataSet> const & GetDataSets() const;
39             std::vector<DataSet> const & GetResponses() const;
40         };
41     } // end namespace network
42 } // end namespace gdcm
43
44 #endif // GDCMULCONNECTIONBASICCALLBACK_H

```

## 11.587 gdcmULConnection.h File Reference

```

#include "gdcmNetworkStateID.h"
#include "gdcmARTIMTimer.h"
#include "gdcmULConnectionInfo.h"
#include "gdcmPresentationContextRQ.h"
#include "gdcmDataElement.h"
#include "gdcmPresentationContextAC.h"
#include "gdcmPresentationContext.h"

```

Include dependency graph for gdcmULConnection.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ULConnection](#)  
*ULConnection.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.588 gdcmULConnection.h

[Go to the documentation of this file.](#)

```

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13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULCONNECTION_H
19 #define GDCMULCONNECTION_H
20
21 #include "gdcmNetworkStateID.h"
22 #include "gdcmARTIMTimer.h"
23 #include "gdcmULConnectionInfo.h"
24 #include "gdcmPresentationContextRQ.h"
25 #include "gdcmDataElement.h"
26 #include "gdcmPresentationContextAC.h"
27 #include "gdcmPresentationContext.h"
28
29 class iosocket;
30 class echo;
31 namespace gdcm{
32     namespace network{
33
57 class GDCM_EXPORT ULConnection
58 {
59     ULConnectionInfo mInfo;
60     //this is a dirty dirty hack
61     //but to establish an outgoing connection (scu), we need the echo service
62     //to establish incoming, we just need a port and localhost, so an iosocket works while an
63     //echo would fail (probably because one already exists)
64     echo* mEcho;
65     iosocket* mSocket; //of the three protocols offered by socket++-- echo, smtp, and ftp--
66     //echo most closely matches what the DICOM standard describes as a network connection
67     ARTIMTimer mTimer;
68
69     EStateID mCurrentState;
70
71     std::vector<PresentationContextRQ> mPresentationContexts;
72     //this is our list of presentation contexts of what we can send
73     uint32_t mMaxPDUSize;
74
75     std::vector<PresentationContextAC> mAcceptedPresentationContexts; //these come back from the server
76     //and tell us what can be sent over this connection
77
78     TransferSyntaxSub cstorets;
79
80     friend class ULActionAE6;
81     void SetCStoreTransferSyntax( TransferSyntaxSub const & ts );
82     friend class ULConnectionManager;
83     TransferSyntaxSub const & GetCStoreTransferSyntax( ) const;
84 public:
85
86     ULConnection(const ULConnectionInfo& inUserInformation);
87     //destructors are virtual to prevent memory leaks by inherited classes
88     virtual ~ULConnection();
89
90     EStateID GetState() const;
91     void SetState(const EStateID& inState); //must be able to update state...
92
93     //echo* GetProtocol();
94     std::iostream* GetProtocol();
95     void StopProtocol();
96
97     ARTIMTimer& GetTimer();
98
99     const ULConnectionInfo &GetConnectionInfo() const;

```

```

100
101 //when the connection is first associated, the connection is told
102 //the max packet/PDU size and the way in which to present data
103 //(presentation contexts, etc). Store that here.
104 void SetMaxPDUSize(uint32_t inSize);
105 uint32_t GetMaxPDUSize() const;
106
107 const PresentationContextAC *GetPresentationContextACByID(uint8_t id) const;
108 const PresentationContextRQ *GetPresentationContextRQByID(uint8_t id) const;
109
110 uint8_t GetPresentationContextIDFromPresentationContext(PresentationContextRQ const & pc) const;
111
112 std::vector<PresentationContextRQ> const & GetPresentationContexts() const;
113 void SetPresentationContexts(const std::vector<PresentationContextRQ>& inContexts);
114
115 void SetPresentationContexts(const std::vector<PresentationContext>& inContexts);
116
117 //given a particular data element, presumably the SOP class,
118 //find the presentation context for that SOP
119 //NOT YET IMPLEMENTED
120 PresentationContextRQ FindContext(const DataElement& de) const;
121
122 std::vector<PresentationContextAC> const & GetAcceptedPresentationContexts() const;
123 std::vector<PresentationContextAC> & GetAcceptedPresentationContexts();
124 void AddAcceptedPresentationContext(const PresentationContextAC& inPC);
125
126 bool InitializeConnection();
127
128 bool InitializeIncomingConnection();
129
130 ULConnection(const ULConnection&) = delete;
131 void operator=(const ULConnection&) = delete;
132 };
133 }
134 }
135
136 #endif // ULCONNECTION_H

```

## 11.589 gdcmULConnectionCallback.h File Reference

#include "gdcmTypes.h"

Include dependency graph for gdcmULConnectionCallback.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ULConnectionCallback](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.590 gdcmULConnectionCallback.h

[Go to the documentation of this file.](#)

```

1 /*=====
2 *
3 * Copyright NumFOCUS

```

```

4 *
5 * Licensed under the Apache License, Version 2.0 (the "License");
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9 *     http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 * Unless required by applicable law or agreed to in writing, software
12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULCONNECTIONCALLBACK_H
19 #define GDCMULCONNECTIONCALLBACK_H
20
21 #include "gdcmTypes.h" //to be able to export the class
22
23 namespace gdcm
24 {
25     class DataSet;
26     namespace network
27     {
28     {
29         class GDCM_EXPORT ULConnectionCallback {
30             bool mHandledDataSet;
31         protected:
32             bool mImplicit;
33             //inherited callbacks MUST call this function for the cmove loop to work properly
34             void DataSetHandled() { mHandledDataSet = true; }
35         public:
36             ULConnectionCallback():mHandledDataSet(false),mImplicit(true){}
37             virtual ~ULConnectionCallback() = default; //placeholder for inherited objects
38             virtual void HandleDataSet(const DataSet& inDataSet) = 0;
39             virtual void HandleResponse(const DataSet& inDataSet) = 0;
40
41             bool DataSetHandles()const { return mHandledDataSet; }
42             void ResetHandledDataSet() { mHandledDataSet = false; }
43
44             void SetImplicitFlag( const bool imp ) { mImplicit = imp; }
45         };
46     }
47 }
48 #endif //GDCMULCONNECTIONCALLBACK_H

```

## 11.591 gdcmULConnectionInfo.h File Reference

```

#include "gdcmUserInformation.h"
#include <string>

```

Include dependency graph for gdcmULConnectionInfo.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ULConnectionInfo](#)  
*ULConnectionInfo.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.592 gdcmULConnectionInfo.h

[Go to the documentation of this file.](#)

```

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2  *
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7  *   You may obtain a copy of the License at
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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULCONNECTIONINFO_H
19 #define GDCMULCONNECTIONINFO_H
20
21 #include "gdcmUserInformation.h"
22 #include <string>
23
24 namespace gdcm{
25     namespace network {
26         class ULConnectionInfo {
27             UserInformation mUserInformation;
28
29             std::string mCalledAETitle;
30             std::string mCallingAETitle;
31
32             unsigned long mCalledIPAddress;
33             int mCalledIPPort;
34             std::string mCalledComputerName; //either the IP or the name has to be filled in
35
36             unsigned long mMaxPDULength;
37         public:
38             ULConnectionInfo();
39
40             //it is possible to misinitialize this object, so
41             //have it return false if something breaks (ie, given AEs are bigger than 16 characters,
42             //no name or IP address).
43             bool Initialize(UserInformation const &inUserInformation,
44                 const char *inCalledAETitle, const char *inCallingAETitle,
45                 unsigned long inCalledIPAddress, int inCalledIPPort,
46                 std::string inCalledComputerName);
47
48             //UserInformation GetUserInformation() const;
49             const char* GetCalledAETitle() const;
50             const char* GetCallingAETitle() const;
51
52             unsigned long GetCalledIPAddress() const;
53             int GetCalledIPPort() const;
54             std::string GetCalledComputerName() const;
55
56             //CStore needs to know the max pdu length, so the value gets initialized
57             //when a cstore connection is established (but not for the others).
58             void SetMaxPDULength(unsigned long inMaxPDULength);
59             unsigned long GetMaxPDULength() const;
60         };
61     }
62 }
63
64 #endif //GDCMULCONNECTIONINFO_H

```

## 11.593 gdcmULConnectionManager.h File Reference

```

#include "gdcmULTransitionTable.h"
#include "gdcmULConnection.h"

```

```
#include "gdcmULConnectionInfo.h"
#include "gdcmPresentationDataValue.h"
#include "gdcmULConnectionCallback.h"
#include "gdcmSubject.h"
#include "gdcmPresentationContext.h"
Include dependency graph for gdcmULConnectionManager.h:
```

## Classes

- class [gdcm::network::ULConnectionManager](#)  
*ULConnectionManager.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.594 gdcmULConnectionManager.h

[Go to the documentation of this file.](#)

```
1 /*=====
2 *
3 * Copyright NumFOCUS
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9 *     http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 * Unless required by applicable law or agreed to in writing, software
12 * distributed under the License is distributed on an "AS IS" BASIS,
13 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 * See the License for the specific language governing permissions and
15 * limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULCONNECTIONMANAGER_H
19 #define GDCMULCONNECTIONMANAGER_H
20
21 #include "gdcmULTransitionTable.h"
22 #include "gdcmULConnection.h"
23 #include "gdcmULConnectionInfo.h"
24 #include "gdcmPresentationDataValue.h"
25 #include "gdcmULConnectionCallback.h"
26 #include "gdcmSubject.h"
27 #include "gdcmPresentationContext.h"
28
29 namespace gdcm {
30     class File;
31     class BaseRootQuery;
32     class BaseQuery;
33
34     namespace network {
35
36     class GDCM_EXPORT ULConnectionManager : public Subject
37     {
38     protected:
39         ULConnection* mConnection;
40         ULConnection* mSecondaryConnection;
41         ULTransitionTable mTransitions;
42
43     //no copying
44     }
```

```

53     ULConnectionManager(const ULConnectionManager& inCM);
54
55     //event handler loop.
56     //will just keep running until the current event is nonexistent.
57     //at which point, it will return the current state of the connection
58     //this starts by initiating an action, but can be put into a passive mode
59     //for a cmove/cstore combination by setting startWaiting to true
60     EStateID RunEventLoop(ULEvent& inEvent, ULConnection* inWhichConnection,
61         ULConnectionCallback* inCallback, const bool& startWaiting);
62
63     //like the above, but will manage the event loop for a move event (which
64     //is basically two simultaneous connections interwoven, one inbound and
65     //the other outbound. Note, for instance, that cmoversp's can be sent back
66     //during the other connection's operation.
67     EStateID RunMoveEventLoop(ULEvent& inEvent, ULConnectionCallback* inCallback);
68
69 public:
70     ULConnectionManager();
71     ~ULConnectionManager() override;
72
73     // NOTE: (MM) The following two functions are difficult to use, therefore marking
74     // them as internal for now.
75
76     // \internal
77     bool EstablishConnection(const std::string& inAETitle,
78         const std::string& inConnectAETitle,
79         const std::string& inComputerName, long inIPAddress,
80         uint16_t inConnectPort, double inTimeout,
81         std::vector<PresentationContext> const & pcVector );
82
83     bool EstablishConnectionMove(const std::string& inAETitle,
84         const std::string& inConnectAETitle,
85         const std::string& inComputerName, long inIPAddress,
86         uint16_t inConnectPort, double inTimeout,
87         uint16_t inReturnPort,
88         std::vector<PresentationContext> const & pcVector);
89     // \endinternal
90
91     //bool ReestablishConnection(const EConnectionType& inConnectionType,
92     // const DataSet& inDS);
93
94     //allows for a connection to be broken, but waits for an acknowledgement
95     //of the breaking for a certain amount of time. Returns true of the
96     //other side acknowledges the break
97     bool BreakConnection(const double& inTimeout);
98
99     //severs the connection, if it's open, without waiting for any kind of response.
100     //typically done if the program is going down.
101     void BreakConnectionNow();
102
103     //This function will send a given piece of data
104     //across the network connection. It will return true if the
105     //sending worked, false otherwise.
106     //note that sending is asynchronous; as such, there's
107     //also a 'receive' option, but that requires a callback function.
108     //bool SendData();
109
110     //send the Data PDU associated with Echo (ie, a default DataPDU)
111     //this lets the user confirm that the connection is alive.
112     //the user should look to cout to see the response of the echo command
113     //returns the PresentationDataValue that was returned by the remote
114     //host. Note that the PDV can be uninitialized, which would indicate failure.
115     //Echo does not use a callback for results.
116     std::vector<PresentationDataValue> SendEcho();
117
118     // \internal
119     // API will change...
120     std::vector<DataSet> SendStore(const File &file, std::istream * pStream = nullptr, std::streampos
121     dataSetOffset = 0 );
122     std::vector<DataSet> SendFind(const BaseRootQuery* inRootQuery);
123     std::vector<DataSet> SendMove(const BaseRootQuery* inRootQuery);
124
125     std::vector<DataSet> SendNEventReport (const BaseQuery* inQuery);
126     std::vector<DataSet> SendNGet (const BaseQuery* inQuery);
127     std::vector<DataSet> SendNSet (const BaseQuery* inQuery);
128     std::vector<DataSet> SendNAction (const BaseQuery* inQuery);
129     std::vector<DataSet> SendNCreate (const BaseQuery* inQuery);
130     std::vector<DataSet> SendNDelete (const BaseQuery* inQuery);
131     // \endinternal
132
133
134
135
136
137
138
139
140
141

```



```

143     void SendStore(const File & file, ULConnectionCallback* inCallback, std::istream * pStream = nullptr ,
std::streampos dataSetOffset = 0 );
144     void SendFind(const BaseRootQuery* inRootQuery, ULConnectionCallback* inCallback);
146     bool SendMove(const BaseRootQuery* inRootQuery, ULConnectionCallback* inCallback);
147
148     void SendNEventReport (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
149     void SendNGet      (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
150     void SendNSet      (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
151     void SendNAction   (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
152     void SendNCreate   (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
153     void SendNDelete   (const BaseQuery* inQuery, ULConnectionCallback* inCallback);
154
155     };
156 }
157 }
158
159 #endif // GDCMULCONNECTIONMANAGER_H

```

## 11.595 gdcmULEvent.h File Reference

```

#include "gdcmNetworkStateID.h"
#include "gdcmNetworkEvents.h"
#include "gdcmBasePDU.h"
#include <vector>

```

Include dependency graph for gdcmULEvent.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::ULEvent](#)  
*ULEvent.*

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.596 gdcmULEvent.h

[Go to the documentation of this file.](#)

```

1  /*=====
2  *
3  *   Copyright NumFOCUS
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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17  *=====*/
18 #ifndef GDCMULEVENT_H

```

```

19 #define GDCMULEVENT_H
20
21 #include "gdcmNetworkStateID.h"
22 #include "gdcmNetworkEvents.h"
23 #include "gdcmBasePDU.h"
24 #include <vector>
25
26 namespace gdcm {
27     namespace network {
28
29     class ULEvent {
30     public:
31         EEventID mEvent;
32         std::vector<BasePDU*> mBasePDU;
33         std::istream * m_pStream ;
34         std::streampos m_posDataSet ;
35         void DeletePDUVector(){
36             std::vector<BasePDU*>::iterator baseItr;
37             for (baseItr = mBasePDU.begin(); baseItr < mBasePDU.end(); baseItr++){
38                 if (*baseItr != NULL){
39                     delete *baseItr;
40                     *baseItr = NULL;
41                 }
42             }
43         }
44
45     public:
46         ULEvent(const EEventID& inEventID, std::vector<BasePDU*> inBasePDU, std::istream * iStream = nullptr,
47             std::streampos posDataSet = 0 ){
48             mEvent = inEventID;
49             mBasePDU = inBasePDU;
50             m_pStream = iStream ;
51             m_posDataSet = posDataSet ;
52         }
53         ULEvent(const EEventID& inEventID, BasePDU* inBasePDU, std::istream * iStream = nullptr, std::streampos
54             posDataSet = 0 ){
55             mEvent = inEventID;
56             mBasePDU.push_back(inBasePDU);
57             m_pStream = iStream ;
58             m_posDataSet = posDataSet ;
59         }
60         ~ULEvent () {
61             DeletePDUVector();
62         }
63
64         EEventID GetEvent()const { return mEvent; }
65         std::vector<BasePDU*> const & GetPDUs()const { return mBasePDU; }
66         std::istream * GetIStream()const { return m_pStream; }
67         std::streampos GetDataSetPos()const { return m_posDataSet; }
68
69         void SetEvent(const EEventID& inEvent) { mEvent = inEvent; }
70         void SetPDU(std::vector<BasePDU*> const & inPDU) {
71             DeletePDUVector();
72             mBasePDU = inPDU;
73         }
74     };
75 }
76
77 #endif //GDCMULEVENT_H

```

## 11.597 gdcmULTransitionTable.h File Reference

```

#include "gdcmNetworkStateID.h"
#include "gdcmNetworkEvents.h"
#include "gdcmULAction.h"
#include <cstdlib>

```

Include dependency graph for gdcmULTransitionTable.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::TableRow](#)

- struct [gdcm::network::Transition](#)
- class [gdcm::network::ULTransitionTable](#)  
*ULTransitionTable* The transition table of all the ULEvents, new ULActions, and ULStates.

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.598 gdcmULTransitionTable.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULTRANSITIONTABLE_H
19 #define GDCMULTRANSITIONTABLE_H
20
21 #include "gdcmNetworkStateID.h"
22 #include "gdcmNetworkEvents.h"
23 #include "gdcmULAction.h"
24
25 #include <cstdlib> // NULL
26
27 namespace gdcm {
28 class Subject;
29 namespace network{
30 class ULConnection;
31 class ULAction;
32 class ULEvent;
33
34 //The transition dictates the action that should be taken from the start state to the end state
35 struct Transition {
36     int mEnd;
37     ULAction* mAction;
38     Transition(){
39         mEnd = eStaDoesNotExist;
40         mAction = nullptr;
41     }
42     ~Transition(){
43         if (mAction != nullptr){
44             delete mAction;
45             mAction = nullptr;
46         }
47     }
48     Transition(int inEndState, ULAction* inAction){
49         mEnd = inEndState;
50         mAction = inAction;
51     }
52     static Transition* MakeNew(int inEndState, ULAction* inAction){
53         return new Transition(inEndState, inAction);
54     }
55 };
56
57 //used to define a row in table 9-10 of 3.8 2009

```

```

58     //the transition table is events, then state,
59     //then the transition itself (which has the event
60     //and start state implied by their starting locations)
61     //don't need to store the event; that's implicitly defined in the Table itself by location
62     class TableRow{
63     public:
64         TableRow() {
65             for(int stateIndex = 0; stateIndex < cMaxStateID; ++stateIndex)
66             {
67                 transitions[stateIndex] = nullptr;
68             }
69         }
70         ~TableRow() {
71             for(int stateIndex = 0; stateIndex < cMaxStateID; ++stateIndex)
72             {
73                 Transition *t = transitions[stateIndex];
74                 delete t;
75             }
76         }
77         Transition *transitions[cMaxStateID];
78
79         //copy constructor for stl additions into the transition table below.
80     };
81
82     class ULTransitionTable
83     {
84     private:
85         TableRow mTable[cMaxEventID];
86     public:
87         ULTransitionTable();
88
89         void HandleEvent(Subject*s, ULEvent& inEvent, ULConnection& inConnection,
90             bool& outWaitingForEvent, EEventID& outRaisedEvent) const;
91
92         void PrintTable() const; //so that the table can be printed and verified against the DICOM standard
93     };
94 }
95
96 #endif // GDCMULTRANSITIONTABLE_H

```

## 11.599 gdcmULWritingCallback.h File Reference

#include "gdcmULConnectionCallback.h"  
 Include dependency graph for gdcmULWritingCallback.h:

### Classes

- class [gdcm::network::ULWritingCallback](#)

### Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.600 gdcmULWritingCallback.h

[Go to the documentation of this file.](#)

```

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9  *       http://www.apache.org/licenses/LICENSE-2.0.txt
10 *
11 *   Unless required by applicable law or agreed to in writing, software
12 *   distributed under the License is distributed on an "AS IS" BASIS,
13 *   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
14 *   See the License for the specific language governing permissions and
15 *   limitations under the License.
16 *
17 *=====*/
18 #ifndef GDCMULCONNECTIONWRITINGCALLBACK_H
19 #define GDCMULCONNECTIONWRITINGCALLBACK_H
20
21 #include "gdcmULConnectionCallback.h"
22
23 namespace gdcm
24 {
25     class DataSet;
26     namespace network
27     {
28         /* \brief ULWritingCallback
29         * \details This is the most basic of callbacks for how the ULConnectionManager handles
30         * incoming datasets. DataSets are immediately written to disk as soon as they
31         * are received. NOTE that if the incoming connection is faster than the disk
32         * writing speed, this callback could cause some pileups!
33         */
34         class GDCM_EXPORT ULWritingCallback : public ULConnectionCallback
35         {
36         public:
37             std::string mDirectoryName;
38             ULWritingCallback() = default;
39             ~ULWritingCallback() override = default; //empty, for later inheritance
40
41             void SetDirectory(const std::string& inDirectoryName) { mDirectoryName = inDirectoryName; }
42
43             void HandleDataSet(const DataSet& inDataSet) override;
44             void HandleResponse(const DataSet& inDataSet) override;
45         };
46     } // end namespace network
47 } // end namespace gdcm
48
49 #endif //GDCMULCONNECTIONWRITINGCALLBACK_H

```

## 11.601 gdcmUserInformation.h File Reference

```

#include "gdcmTypes.h"
#include "gdcmMaximumLengthSub.h"
#include "gdcmImplementationVersionNameSub.h"
#include "gdcmImplementationClassUIDSub.h"

```

Include dependency graph for gdcmUserInformation.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [gdcm::network::UserInformation](#)  
*UserInformation.*

## Namespaces

- namespace [gdcm](#)
- namespace [gdcm::network](#)

## 11.602 gdcmUserInformation.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMUSERINFORMATION_H
15 #define GDCMUSERINFORMATION_H
16
17 #include "gdcmTypes.h"
18 #include "gdcmMaximumLengthSub.h"
19 #include "gdcmImplementationVersionNameSub.h"
20 #include "gdcmImplementationClassUIDSub.h"
21
22 namespace gdcm
23 {
24
25     namespace network
26     {
27
28         class AsynchronousOperationsWindowSub;
29         class RoleSelectionSub;
30         struct RoleSelectionSubItems;
31         class SOPClassExtendedNegociationSub;
32         struct SOPClassExtendedNegociationSubItems;
33         class UserInformation
34         {
35         public:
36             UserInformation();
37             ~UserInformation();
38             std::istream &Read(std::istream &is);
39             const std::ostream &Write(std::ostream &os) const;
40             size_t Size() const;
41
42             void Print(std::ostream &os) const;
43
44             const MaximumLengthSub &GetMaximumLengthSub()const { return MLS; }
45             MaximumLengthSub &GetMaximumLengthSub() { return MLS; }
46
47             void AddRoleSelectionSub( RoleSelectionSub const & r );
48             void AddSOPClassExtendedNegociationSub( SOPClassExtendedNegociationSub const & s );
49
50         private:
51             static const uint8_t ItemType;
52             static const uint8_t Reserved2;
53             uint16_t ItemLength; // len of
54             MaximumLengthSub MLS;
55             ImplementationClassUIDSub ICUID;
56             AsynchronousOperationsWindowSub *AOWS;
57             RoleSelectionSubItems *RSSI;
58             SOPClassExtendedNegociationSubItems *SOPCENSI;
59             ImplementationVersionNameSub IVNS;
60
61         public:
62             UserInformation(const UserInformation&) = delete;
63             UserInformation &operator=(const UserInformation&);
64         };
65
66

```

```

76 } // end namespace network
77
78 } // end namespace gdcm
79
80 #endif //GDCMUSERINFORMATION_H

```

## 11.603 gdcmWLMFindQuery.h File Reference

```
#include "gdcmBaseRootQuery.h"
```

Include dependency graph for gdcmWLMFindQuery.h:

### Classes

- class [gdcm::WLMFindQuery](#)  
*PatientRootQuery.*

### Namespaces

- namespace [gdcm](#)

## 11.604 gdcmWLMFindQuery.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 #ifndef GDCMWLMFindQuery_H
15 #define GDCMWLMFindQuery_H
16
17 #include "gdcmBaseRootQuery.h"
18
19 namespace gdcm
20 {
21     class GDCM_EXPORT WLMFindQuery : public BaseRootQuery
22     {
23     public:
24         WLMFindQuery();
25
26         // no sense here
27         void InitializeDataSet(const EQueryLevel& inQueryLevel) override;
28         std::vector<Tag> GetTagListByLevel(const EQueryLevel& inQueryLevel) override;
29         // validate query has required tag
30         bool ValidateQuery(bool inStrict = true) const override;
31
32         UIDs::TSName GetAbstractSyntaxUID() const override;
33     protected:
34         DataSet GetValidDataSet() const;
35     };
36 } // end namespace gdcm
37
38 #endif // GDCMWLMFindQuery_H

```

## 11.605 vtkGDCMImageReader.h File Reference

```
#include "vtkgdcmModule.h"
#include "vtkMedicalImageReader2.h"
#include "vtkImageData.h"
#include "vtkVersion.h"
```

Include dependency graph for vtkGDCMImageReader.h: This graph shows which files directly or indirectly include this file:

### Classes

- class [vtkGDCMImageReader](#)

### Namespaces

- namespace [gdcm](#)

### Macros

- #define [VTK\\_CMYK](#) 8
- #define [VTK\\_INVERSE\\_LUMINANCE](#) 5
- #define [VTK\\_LOOKUP\\_TABLE](#) 6
- #define [VTK\\_YBR](#) 7

### 11.605.1 Macro Definition Documentation

#### 11.605.1.1 VTK\_CMYK

```
#define VTK_CMYK 8
```

#### 11.605.1.2 VTK\_INVERSE\_LUMINANCE

```
#define VTK_INVERSE_LUMINANCE 5
```



## 11.605.1.3 VTK\_LOOKUP\_TABLE

```
#define VTK_LOOKUP_TABLE 6
```

## 11.605.1.4 VTK\_YBR

```
#define VTK_YBR 7
```

## 11.606 vtkGDCMImageReader.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMImageReader - read DICOM Image files (Pixel Data)
15 // .SECTION Description
16 // vtkGDCMImageReader is a source object that reads some DICOM files
17 // this reader is single threaded.
18 // .SECTION Implementation note: when FileLowerLeft is set to on the image is not flipped
19 // upside down as VTK would expect, use this option only if you know what you are doing.
20 // .SECTION Implementation note: when reading a series of 2D slices, user is
21 // expected to provide an ordered list of filenames. No sorting will be applied afterward.
22 // .SECTION Implementation note: Although 99% of the time the Zspacing as read
23 // from a tag in a 2D DICOM file should be correct, there has been reports that this
24 // value can be missing, or incorrect, in which case users are advised to override this
25 // value using the return value from gdcm::IPPSorter::GetZSpacing() and set it via
26 // vtkImageChangeInformation on the reader itself.
27 // .SECTION TODO
28 // This reader does not handle a series of 3D images, only a single 3D (multi frame) or a
29 // list of 2D files are supported for now.
30 // .SECTION TODO
31 // Did not implement SetFilePattern / SetFilePrefix API, move it to protected section for now.
32 // .SECTION BUG
33 // Overlay are assumed to have the same extent as image. Right now if overlay origin is not
34 // 0,0 the overlay will have an offset...
35 // Only the very first overlay is loaded at the VTK level, for now (even if there are more than one in the
36 // file)
37 // .SECTION DataOrigin
38 // When the reader is instantiated with FileLowerLeftOn the DataOrigin and Image Position (Patient) are
39 // identical. But when FileLowerLeft is Off, we have to reorder the Y-line of the image, and thus the
40 // DataOrigin
41 // is then translated to the other side of the image.
42 // .SECTION Spacing
43 // When reading a 3D volume, the spacing along the Z dimension might be negative (so as to respect
44 // up-side-down)
45 // as specified in the Image Orientation (Patient) tag. When Z-spacing is 0, this means the multi-frame
46 // object
47 // contains image which do not represent uniform volume.
48 // .SECTION Warning
49 // When using vtkGDCMPolyDataReader in conjunction with vtkGDCMImageReader
50 // it is *required* that FileLowerLeft is set to ON as coordinate system
51 // would be inconsistent in between the two data structures.
52 // .SECTION Color Space mapping:
53 // * VTK_LUMINANCE <-> MONOCHROME2
54 // * VTK_LUMINANCE_ALPHA <-> Not supported
```

```

51 // * VTK_RGB                <-> RGB
52 // * VTK_RGBA               <-> ARGB (deprecated, DICOM 2008)
53 // * VTK_INVERSE_LUMINANCE  <-> MONOCHROME1
54 // * VTK_LOOKUP_TABLE       <-> PALETTE COLOR
55 // * VTK_YBR                 <-> YBR_FULL
56 //
57 // For detailed information on color space transformation and true lossless transformation see:
58 // http://gdcm.sourceforge.net/wiki/index.php/Color_Space_Transformations
59
60 // .SECTION See Also
61 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMPolyDataReader vtkGDCMImageWriter
62 // vtkDICOMImageReader
63
64 #ifndef VTKGDCMIMAGEREADER_H
65 #define VTKGDCMIMAGEREADER_H
66
67 #include "vtkgdcmModule.h"
68 #include "vtkMedicalImageReader2.h"
69 #include "vtkImageData.h"
70 #include "vtkVersion.h"
71
72 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
73 #else
74 class vtkMedicalImageProperties;
75 #endif
76 #if (VTK_MAJOR_VERSION > 5) || ( VTK_MAJOR_VERSION == 5 && VTK_MINOR_VERSION > 0 )
77 #else
78 class vtkStringArray;
79 #endif
80 class vtkPolyData;
81
82 // vtkSystemIncludes.h defines:
83 // #define VTK_LUMINANCE 1
84 // #define VTK_LUMINANCE_ALPHA 2
85 // #define VTK_RGB 3
86 // #define VTK_RGBA 4
87 #ifndef VTK_INVERSE_LUMINANCE
88 #define VTK_INVERSE_LUMINANCE 5
89 #endif
90 #ifndef VTK_LOOKUP_TABLE
91 #define VTK_LOOKUP_TABLE 6
92 #endif
93 #ifndef VTK_YBR
94 #define VTK_YBR 7
95 #endif
96 #ifndef VTK_CMYK
97 #define VTK_CMYK 8
98 #endif
99
100 //BTX
101 namespace gdcm { class ImageReader; }
102 //ETX
103 class vtkMatrix4x4;
104 class VTKGDCM_EXPORT vtkGDCMImageReader : public vtkMedicalImageReader2
105 {
106 public:
107     static vtkGDCMImageReader *New();
108     vtkTypeMacro(vtkGDCMImageReader,vtkMedicalImageReader2);
109     virtual void PrintSelf(ostream& os, vtkIndent indent);
110
111     // Description: is the given file name a DICOM file containing an image ?
112     virtual int CanReadFile(const char* fname);
113
114     // Description:
115     // Valid extensions
116     virtual const char* GetFileExtensions()
117     {
118         // I would like to get rid of ACR/NEMA/IMA so only allow dcm extension for now
119         return ".dcm .DCM";
120     }
121
122     // Description:
123     // A descriptive name for this format
124     virtual const char* GetDescriptiveName()
125     {
126         return "DICOM";
127     }
128
129     // Description:
130     // Get the Image Position (Patient) as stored in the DICOM file
131     // This is a read-only data member

```

```

132   vtkGetObjectMacro(DirectionCosines, vtkMatrix4x4);
133
134   #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
135   #else
136       // Description:
137       // Get the medical image properties object
138       vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
139   #endif
140   virtual void SetMedicalImageProperties(vtkMedicalImageProperties *pd);
141
142   #if (VTK_MAJOR_VERSION > 5) || ( VTK_MAJOR_VERSION == 5 && VTK_MINOR_VERSION > 0 )
143   #else
144       virtual void SetFileNames(vtkStringArray*);
145       vtkGetObjectMacro(FileNames, vtkStringArray);
146   #endif
147
148   // Description:
149   // Specifically request to load the overlay into the gdcm-VTK layer (gdcm always loads them when found).
150   // If no overlay is found in the image, then the vtkImageData for the overlay will be empty.
151   vtkGetMacro(LoadOverlays,int);
152   vtkSetMacro(LoadOverlays,int);
153   vtkBooleanMacro(LoadOverlays,int);
154
155   // Description:
156   // Set/Get whether or not to load the Icon as vtkImageData (if found in the DICOM file)
157   vtkGetMacro(LoadIconImage,int);
158   vtkSetMacro(LoadIconImage,int);
159   vtkBooleanMacro(LoadIconImage,int);
160
161   // Description:
162   // Set/Get whether or not the image was compressed using a lossy compression algorithm
163   vtkGetMacro(LossyFlag,int);
164   vtkSetMacro(LossyFlag,int);
165   vtkBooleanMacro(LossyFlag,int);
166
167   // Description:
168   // Read only: number of overlays as found in this image (multiple overlays per slice is allowed)
169   // Only valid when LoadOverlays is true
170   vtkGetMacro(NumberOfOverlays,int);
171
172   // Description:
173   // Read only: number of icon image (there can only be zero or one icon per file)
174   // Only valid when LoadIconImage is true
175   vtkGetMacro(NumberOfIconImages,int);
176
177   // Description:
178   // Get Overlay/IconImage
179   // Remember to ALWAYS use those methods in your code, as the internal number for the output port
180   // is not guarantee to remain the same, as features are added to the reader
181   #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
182   //FIXME: Need to get rid of BTX/ETX if only the Python Wrapper of VTK 4.2 would let me
183   //BTX
184   vtkAlgorithmOutput* GetOverlayPort(int index);
185   vtkAlgorithmOutput* GetIconImagePort();
186   //ETX
187   #endif
188   vtkImageData* GetOverlay(int i);
189   vtkImageData* GetIconImage();
190
191   // Description:
192   // Load image with its associated Lookup Table
193   vtkGetMacro(ApplyLookupTable,int);
194   vtkSetMacro(ApplyLookupTable,int);
195   vtkBooleanMacro(ApplyLookupTable,int);
196
197   // Description:
198   // Load image as YBR
199   vtkGetMacro(ApplyYBRToRGB,int)
200   vtkSetMacro(ApplyYBRToRGB,int)
201   vtkBooleanMacro(ApplyYBRToRGB,int);
202
203   // Description:
204   // Return VTK_LUMINANCE, VTK_INVERSE_LUMINANCE, VTK_RGB, VTK_RGBA, VTK_LOOKUP_TABLE, VTK_YBR or VTK_CMYK
205   // or 0 when ImageFormat is not handled.
206   // Warning: For color image, PlanarConfiguration need to be taken into account.
207   vtkGetMacro(ImageFormat,int);
208
209   // Description:
210   // Return the Planar Configuration. This simply means that the internal DICOM image was stored
211   // using a particular planar configuration (most of the time: 0)
212   // For monochrome image, PlanarConfiguration is always 0

```

```

213   vtkGetMacro(PlanarConfiguration,int);
214
215   // Description:
216   // Return the 'raw' information stored in the DICOM file:
217   // In case of a series of multiple files, only the first file is considered. The Image Orientation
(Patient)
218   // is guarantee to remain the same, and image Image Position (Patient) in other slice can be computed
219   // using the ZSpacing (3rd dimension)
220   // (0020,0032) DS [87.774866\ -182.908510\168.629671] # 32, 3 ImagePositionPatient
221   // (0020,0037) DS [0.001479\0.999989\ -0.004376\ -0.002039\ -0.004372\ -0.999988] # 58, 6
ImageOrientationPatient
222   vtkGetVector3Macro(ImagePositionPatient,double);
223   vtkGetVector6Macro(ImageOrientationPatient,double);
224
225   // Description:
226   // Set/Get the first Curve Data:
227   vtkGetObjectMacro(Curve,vtkPolyData);
228   virtual void SetCurve(vtkPolyData *pd);
229
230   // Description:
231   // \DEPRECATED:
232   // Modality LUT
233   // Value returned by GetShift/GetScale might be inaccurate since Shift/Scale could be
234   // varying along the Series read. Therefore user are advices not to use those functions
235   // anymore
236   vtkGetMacro(Shift,double);
237   vtkGetMacro(Scale,double);
238
239 protected:
240   vtkGDCMImageReader();
241   ~vtkGDCMImageReader();
242
243   vtkSetVector6Macro(ImageOrientationPatient,double);
244
245 //BTX
246   void FillMedicalImageInformation(const gdcm::ImageReader &reader);
247 //ETX
248   int RequestInformationCompat();
249   int RequestDataCompat();
250
251 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
252   int ProcessRequest(vtkInformation* request,
253                     vtkInformationVector** inputVector,
254                     vtkInformationVector* outputVector);
255   int RequestInformation(vtkInformation *request,
256                         vtkInformationVector **inputVector,
257                         vtkInformationVector *outputVector);
258   int RequestData(vtkInformation *request,
259                  vtkInformationVector **inputVector,
260                  vtkInformationVector *outputVector);
261 #else /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
262   void ExecuteInformation();
263   void ExecuteData(vtkDataObject *out);
264 #endif /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
265
266 protected:
267 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
268 #else
269   // Description:
270   // Medical Image properties
271   vtkMedicalImageProperties *MedicalImageProperties;
272 #endif
273 #if (VTK_MAJOR_VERSION > 5) || ( VTK_MAJOR_VERSION == 5 && VTK_MINOR_VERSION > 0 )
274 #else
275   vtkStringArray *FileNames;
276 #endif
277
278   vtkMatrix4x4 *DirectionCosines;
279   int LoadOverlays;
280   int NumberOfOverlays;
281   int LoadIconImage;
282   int NumberOfIconImages;
283   int IconImageDataExtent[6];
284   double ImagePositionPatient[3];
285   double ImageOrientationPatient[6];
286   vtkPolyData *Curve;
287
288   int ImageFormat;
289   // the following 3, should remain optional
290   int ApplyInverseVideo;
291   int ApplyLookupTable;

```

```

292  int ApplyYBRToRGB;
293  // I think that planar configuration need to always be applied as far as VTK is concerned
294  int ApplyPlanarConfiguration;
295  int ApplyShiftScale;
296
297  int LoadSingleFile(const char *filename, char *pointer, unsigned long &outlen);
298
299  double Shift;
300  double Scale;
301  int IconDataScalarType;
302  int IconNumberOfScalarComponents;
303  int PlanarConfiguration;
304  int LossyFlag;
305  int ForceRescale;
306
307 protected:
308  // TODO / FIXME
309  void SetFilePrefix(const char *) {}
310  vtkGetStringMacro(FilePrefix);
311  void SetFilePattern(const char *) {}
312  vtkGetStringMacro(FilePattern);
313
314 private:
315  vtkGDCMImageReader(const vtkGDCMImageReader&); // Not implemented.
316  void operator=(const vtkGDCMImageReader&); // Not implemented.
317 };
318 #endif

```

## 11.607 vtkGDCMImageReader2.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkMedicalImageReader2.h"
#include "vtkImageData.h"

```

Include dependency graph for vtkGDCMImageReader2.h:

### Classes

- class [vtkGDCMImageReader2](#)

### Namespaces

- namespace [gdcm](#)

### Macros

- #define [VTK\\_CMYK](#) 8
- #define [VTK\\_INVERSE\\_LUMINANCE](#) 5
- #define [VTK\\_LOOKUP\\_TABLE](#) 6
- #define [VTK\\_YBR](#) 7

#### 11.607.1 Macro Definition Documentation

**11.607.1.1 VTK\_CMYK**

```
#define VTK_CMYK 8
```

**11.607.1.2 VTK\_INVERSE\_LUMINANCE**

```
#define VTK_INVERSE_LUMINANCE 5
```

**11.607.1.3 VTK\_LOOKUP\_TABLE**

```
#define VTK_LOOKUP_TABLE 6
```

**11.607.1.4 VTK\_YBR**

```
#define VTK_YBR 7
```

**11.608 vtkGDCMImageReader2.h**

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMImageReader2 - read DICOM Image files (Pixel Data)
15 // .SECTION Description
16 // vtkGDCMImageReader2 is a source object that reads some DICOM files
17 // this reader is single threaded.
18 // .SECTION Implementation note:  when FileLowerLeft is set to on the image is not flipped
19 // upside down as VTK would expect, use this option only if you know what you are doing.
20 // .SECTION Implementation note:  when reading a series of 2D slices, user is
21 // expected to provide an ordered list of filenames.  No sorting will be applied afterward.
22 // .SECTION Implementation note:  Although 99% of the time the Zspacing as read
23 // from a tag in a 2D DICOM file should be correct, there has been reports that this
24 // value can be missing, or incorrect, in which case users are advised to override this
25 // value using the return value from gdcm::IPPSorter::GetZSpacing() and set it via
26 // vtkImageChangeInformation on the reader itself.
27 // .SECTION TODO
28 // This reader does not handle a series of 3D images, only a single 3D (multi frame) or a
29 // list of 2D files are supported for now.
30 // .SECTION TODO
31 // Did not implement SetFilePattern / SetFilePrefix API, move it to protected section for now.
```

```

32 // .SECTION BUG
33 // Overlay are assumed to have the same extent as image. Right now if overlay origin is not
34 // 0,0 the overlay will have an offset...
35 // Only the very first overlay is loaded at the VTK level, for now (even if there are more than one in the
    file)
36 // .SECTION DataOrigin
37 // When the reader is instantiated with FileLowerLeftOn the DataOrigin and Image Position (Patient) are
38 // identical. But when FileLowerLeft is Off, we have to reorder the Y-line of the image, and thus the
    DataOrigin
39 // is then translated to the other side of the image.
40 // .SECTION Spacing
41 // When reading a 3D volume, the spacing along the Z dimension might be negative (so as to respect
    up-side-down)
42 // as specified in the Image Orientation (Patient) tag. When Z-spacing is 0, this means the multi-frame
    object
43 // contains image which do not represent uniform volume.
44 // .SECTION Warning
45 // When using vtkGDCMPolyDataReader in conjunction with vtkGDCMImageReader2
46 // it is *required* that FileLowerLeft is set to ON as coordinate system
47 // would be inconsistent in between the two data structures.
48 // .SECTION Color Space mapping:
49 // * VTK_LUMINANCE      <-> MONOCHROME2
50 // * VTK_LUMINANCE_ALPHA <-> Not supported
51 // * VTK_RGB            <-> RGB
52 // * VTK_RGBA           <-> ARGB (deprecated, DICOM 2008)
53 // * VTK_INVERSE_LUMINANCE <-> MONOCHROME1
54 // * VTK_LOOKUP_TABLE   <-> PALETTE COLOR
55 // * VTK_YBR            <-> YBR_FULL
56 //
57 // For detailed information on color space transformation and true lossless transformation see:
58 // http://gdcm.sourceforge.net/wiki/index.php/Color\_Space\_Transformations
59
60 // .SECTION See Also
61 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMPolyDataReader vtkGDCMImageWriter
62 // vtkDICOMImageReader
63
64 #ifndef VTKGDCMIMAGEREADER2_H
65 #define VTKGDCMIMAGEREADER2_H
66
67 #include "vtkgdcmModule.h"
68 #include "vtkMedicalImageReader2.h"
69 #include "vtkImageData.h"
70
71 class vtkPolyData;
72
73 // vtkSystemIncludes.h defines:
74 // #define VTK_LUMINANCE 1
75 // #define VTK_LUMINANCE_ALPHA 2
76 // #define VTK_RGB 3
77 // #define VTK_RGBA 4
78 #ifndef VTK_INVERSE_LUMINANCE
79 #define VTK_INVERSE_LUMINANCE 5
80 #endif
81 #ifndef VTK_LOOKUP_TABLE
82 #define VTK_LOOKUP_TABLE 6
83 #endif
84 #ifndef VTK_YBR
85 #define VTK_YBR 7
86 #endif
87 #ifndef VTK_CMYK
88 #define VTK_CMYK 8
89 #endif
90
91 //BTX
92 namespace gdcm { class ImageReader; }
93 //ETX
94 class vtkMatrix4x4;
95 class VTKGDCM_EXPORT vtkGDCMImageReader2 : public vtkMedicalImageReader2
96 {
97 public:
98     static vtkGDCMImageReader2 *New();
99     vtkTypeMacro(vtkGDCMImageReader2,vtkMedicalImageReader2);
100     virtual void PrintSelf(ostream& os, vtkIndent indent);
101
102     // Description: is the given file name a DICOM file containing an image ?
103     virtual int CanReadFile(const char* fname);
104
105     // Description:
106     // Valid extensions
107     virtual const char* GetFileExtensions()
108     {

```

```

109 // I would like to get rid of ACR/NEMA/IMA so only allow dcm extension for now
110 return ".dcm .DCM";
111 }
112
113 // Description:
114 // A descriptive name for this format
115 virtual const char* GetDescriptiveName()
116 {
117     return "DICOM";
118 }
119
120 // Description:
121 // Get the Image Position (Patient) as stored in the DICOM file
122 // This is a read-only data member
123 vtkGetObjectMacro(DirectionCosines, vtkMatrix4x4);
124
125 virtual void SetMedicalImageProperties(vtkMedicalImageProperties *pd);
126
127 // Description:
128 // Specifically request to load the overlay into the gdcm-VTK layer (gdcm always loads them when found).
129 // If no overlay is found in the image, then the vtkImageData for the overlay will be empty.
130 vtkGetMacro(LoadOverlays,int);
131 vtkSetMacro(LoadOverlays,int);
132 vtkBooleanMacro(LoadOverlays,int);
133
134 // Description:
135 // Set/Get whether or not to load the Icon as vtkImageData (if found in the DICOM file)
136 vtkGetMacro(LoadIconImage,int);
137 vtkSetMacro(LoadIconImage,int);
138 vtkBooleanMacro(LoadIconImage,int);
139
140 // Description:
141 // Set/Get whether or not the image was compressed using a lossy compression algorithm
142 vtkGetMacro(LossyFlag,int);
143 vtkSetMacro(LossyFlag,int);
144 vtkBooleanMacro(LossyFlag,int);
145
146 // Description:
147 // Read only: number of overlays as found in this image (multiple overlays per slice is allowed)
148 // Only valid when LoadOverlays is true
149 vtkGetMacro(NumberOfOverlays,int);
150
151 // Description:
152 // Read only: number of icon image (there can only be zero or one icon per file)
153 // Only valid when LoadIconImage is true
154 vtkGetMacro(NumberOfIconImages,int);
155
156 // Description:
157 // Get Overlay/IconImage
158 // Remember to ALWAYS use those methods in your code, as the internal number for the output port
159 // is not guarantee to remain the same, as features are added to the reader
160 vtkAlgorithmOutput* GetOverlayPort(int index);
161 vtkAlgorithmOutput* GetIconImagePort();
162 vtkImageData* GetOverlay(int i);
163 vtkImageData* GetIconImage();
164
165 // Description:
166 // Load image with its associated Lookup Table
167 vtkGetMacro(ApplyLookupTable,int);
168 vtkSetMacro(ApplyLookupTable,int);
169 vtkBooleanMacro(ApplyLookupTable,int);
170
171 // Description:
172 // Load image as YBR
173 vtkGetMacro(ApplyYBRToRGB,int);
174 vtkSetMacro(ApplyYBRToRGB,int);
175 vtkBooleanMacro(ApplyYBRToRGB,int);
176
177 // Description:
178 // Return VTK_LUMINANCE, VTK_INVERSE_LUMINANCE, VTK_RGB, VTK_RGBA, VTK_LOOKUP_TABLE, VTK_YBR or VTK_CMYK
179 // or 0 when ImageFormat is not handled.
180 // Warning: For color image, PlanarConfiguration need to be taken into account.
181 vtkGetMacro(ImageFormat,int);
182
183 // Description:
184 // Return the Planar Configuration. This simply means that the internal DICOM image was stored
185 // using a particular planar configuration (most of the time: 0)
186 // For monochrome image, PlanarConfiguration is always 0
187 vtkGetMacro(PlanarConfiguration,int);
188
189 // Description:

```



```

190 // Return the 'raw' information stored in the DICOM file:
191 // In case of a series of multiple files, only the first file is considered. The Image Orientation
(Patient)
192 // is guarantee to remain the same, and image Image Position (Patient) in other slice can be computed
193 // using the ZSpacing (3rd dimension)
194 // (0020,0032) DS [87.774866\ -182.908510\168.629671] # 32, 3 ImagePositionPatient
195 // (0020,0037) DS [0.001479\0.999989\ -0.004376\ -0.002039\ -0.004372\ -0.999988] # 58, 6
ImageOrientationPatient
196 vtkGetVector3Macro(ImagePositionPatient,double);
197 vtkGetVector6Macro(ImageOrientationPatient,double);
198
199 // Description:
200 // Set/Get the first Curve Data:
201 vtkGetObjectMacro(Curve,vtkPolyData);
202 virtual void SetCurve(vtkPolyData *pd);
203
204 // Description:
205 // \DEPRECATED:
206 // Modality LUT
207 // Value returned by GetShift/GetScale might be inaccurate since Shift/Scale could be
208 // varying along the Series read. Therefore user are advices not to use those functions
209 // anymore
210 vtkGetMacro(Shift,double);
211 vtkGetMacro(Scale,double);
212
213 protected:
214 vtkGDCMImageReader2();
215 ~vtkGDCMImageReader2();
216
217 vtkSetVector6Macro(ImageOrientationPatient,double);
218
219 //BTX
220 void FillMedicalImageInformation(const gdcm::ImageReader &reader);
221 //ETX
222 int RequestInformationCompat();
223 int RequestDataCompat();
224
225 int ProcessRequest(vtkInformation* request,
226                   vtkInformationVector** inputVector,
227                   vtkInformationVector* outputVector);
228 int RequestInformation(vtkInformation *request,
229                       vtkInformationVector **inputVector,
230                       vtkInformationVector *outputVector);
231 int RequestData(vtkInformation *request,
232                vtkInformationVector **inputVector,
233                vtkInformationVector *outputVector);
234
235 protected:
236 vtkMatrix4x4 *DirectionCosines;
237 int LoadOverlays;
238 int NumberOfOverlays;
239 int LoadIconImage;
240 int NumberOfIconImages;
241 int IconImageDataExtent[6];
242 double ImagePositionPatient[3];
243 double ImageOrientationPatient[6];
244 vtkPolyData *Curve;
245
246 int ImageFormat;
247 // the following 3, should remain optional
248 int ApplyInverseVideo;
249 int ApplyLookupTable;
250 int ApplyYBRToRGB;
251 // I think that planar configuration need to always be applied as far as VTK is concerned
252 int ApplyPlanarConfiguration;
253 int ApplyShiftScale;
254
255 int LoadSingleFile(const char *filename, char *pointer, unsigned long &outlen);
256
257 double Shift;
258 double Scale;
259 int IconDataScalarType;
260 int IconNumberOfScalarComponents;
261 int PlanarConfiguration;
262 int LossyFlag;
263 int ForceRescale;
264
265 protected:
266 // TODO / FIXME
267 void SetFilePrefix(const char *) {}
268 vtkGetStringMacro(FilePrefix);

```

```

269 void SetFilePattern(const char *) {}
270 vtkGetStringMacro(FilePattern);
271
272 private:
273   vtkGDCMImageReader2(const vtkGDCMImageReader2&); // Not implemented.
274   void operator=(const vtkGDCMImageReader2&); // Not implemented.
275 };
276 #endif

```

## 11.609 vtkGDCMImageWriter.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkImageWriter.h"
#include "vtkVersion.h"

```

Include dependency graph for vtkGDCMImageWriter.h:

### Classes

- class [vtkGDCMImageWriter](#)

## 11.610 vtkGDCMImageWriter.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMImageWriter - write DICOM files
15 // .SECTION Description
16 // vtkGDCMImageWriter is a sink object that write DICOM files
17 // this writer is single threaded (see vtkGDCMThreadedImageReader2 for multi-thread)
18 //
19 // .SECTION Warning:  vtkLookupTable from the vtkImageData object taken into account
20 // only if ImageFormat is set to VTK_LOOKUP_TABLE
21 //
22 // .SECTION NOTE We are not using the usual API SetFilePrefix / SetFilePattern,
23 // but instead a list of filenames:  see SetFileNames and class gdcm::FilenameGenerator
24 //
25 // .SECTION Warning
26 // You need to specify the correct ImageFormat (taken from the reader)
27 // You need to explicitly specify the DirectionCosines (taken from the reader)
28 // Since VTK 5.4 vtkMedicalImageProperties has its own DirectionCosine (no 's')
29 // user need to make sure the vtkMatrix4x4 is compatible with the 6-vector DirectionCosine.
30 //
31 // .SECTION NOTE Shift/Scale are global to all DICOM frames (=files) written
32 // as 2D slice, therefore the shift/scale operation might not be optimized for
33 // all slices.  This is not recommended for image with a large dynamic range.
34 //
35 // .SECTION See Also
36 // vtkImageWriter vtkMedicalImageProperties vtkGDCMImageReader
37
38 #ifndef VTKGDCMIMAGEWRITER_H
39 #define VTKGDCMIMAGEWRITER_H
40

```

```

41 #include "vtkgdcModule.h"
42 #include "vtkImageWriter.h"
43 #include "vtkVersion.h"
44
45 class vtkLookupTable;
46 class vtkMedicalImageProperties;
47 class vtkMatrix4x4;
48 class vtkStringArray;
49 class VTKGDCM_EXPORT vtkGDCMImageWriter : public vtkImageWriter
50 {
51 public:
52     static vtkGDCMImageWriter *New();
53     vtkTypeMacro(vtkGDCMImageWriter,vtkImageWriter);
54     virtual void PrintSelf(ostream& os, vtkIndent indent);
55
56     // Description:
57     // Pass in the vtkmedicalimageproperties object for medical information
58     // to be mapped to DICOM attributes.
59     vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
60     virtual void SetMedicalImageProperties(vtkMedicalImageProperties*);
61
62     // Description:
63     // Pass in the list of filename to be used to write out the DICOM file(s)
64     virtual void SetFileNames(vtkStringArray*);
65     vtkGetObjectMacro(FileNames, vtkStringArray);
66
67     // Description:
68     // Set/Get whether or not the image was compressed using a lossy compression algorithm
69     vtkGetMacro(LossyFlag,int);
70     vtkSetMacro(LossyFlag,int);
71     vtkBooleanMacro(LossyFlag,int);
72
73     // I need that...
74     virtual void Write();
75
76     // Description:
77     // Get the extension for this file format.
78     virtual const char* GetFileExtensions() {
79         return ".dcm .DCM"; }
80
81     // Description:
82     // Get the name of this file format.
83     virtual const char* GetDescriptiveName() {
84         return "DICOM"; }
85
86     // Description:
87     // You need to manually specify the direction the image is in to write a valid DICOM file
88     // since vtkImageData do not contains one (eg. MR Image Storage, CT Image Storage...)
89     virtual void SetDirectionCosines(vtkMatrix4x4 *matrix);
90     vtkGetObjectMacro(DirectionCosines, vtkMatrix4x4);
91     virtual void SetDirectionCosinesFromImageOrientationPatient(const double dircos[6]);
92
93     // Description:
94     // Modality LUT
95     vtkSetMacro(Shift, double);
96     vtkGetMacro(Shift, double);
97     vtkSetMacro(Scale, double);
98     vtkGetMacro(Scale, double);
99
100     // Description:
101     // See vtkGDCMImageReader for list of ImageFormat
102     vtkGetMacro(ImageFormat,int);
103     vtkSetMacro(ImageFormat,int);
104
105     // Description:
106     // Set/Get whether the data comes from the file starting in the lower left
107     // corner or upper left corner.
108     vtkBooleanMacro(FileLowerLeft, int);
109     vtkGetMacro(FileLowerLeft, int);
110     vtkSetMacro(FileLowerLeft, int);
111
112     // Description:
113     // For color image (more than a single comp) you can specify the planar configuration you prefer
114     vtkSetMacro(PlanarConfiguration,int);
115     vtkGetMacro(PlanarConfiguration,int);
116
117     // Description:
118     // Set/Get specific StudyUID / SeriesUID
119     vtkGetStringMacro(StudyUID);
120     vtkGetStringMacro(SeriesUID);
121     vtkSetStringMacro(StudyUID);
122     vtkSetStringMacro(SeriesUID);

```

```

122   vtkGetStringMacro(SeriesUID);
123
124   //BTX
125   enum CompressionTypes {
126       NO_COMPRESSION = 0,    // raw (default)
127       JPEG_COMPRESSION,     // JPEG
128       JPEG2000_COMPRESSION,  // J2K
129       JPEGLS_COMPRESSION,    // JPEG-LS
130       RLE_COMPRESSION        // RLE
131   };
132   //ETX
133   // Set/Get the compression type
134   vtkSetMacro(CompressionType, int);
135   vtkGetMacro(CompressionType, int);
136
137   //void SetCompressionTypeFromString(const char *);
138   //const char *GetCompressionTypeAsString();
139
140 protected:
141   vtkGDCMImageWriter();
142   ~vtkGDCMImageWriter();
143
144   #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
145   int FillInputPortInformation(int port, vtkInformation *info);
146   int RequestInformation(
147       vtkInformation *request,
148       vtkInformationVector **inputVector,
149       vtkInformationVector *outputVector);
150   int RequestUpdateExtent(
151       vtkInformation *request,
152       vtkInformationVector **inputVector,
153       vtkInformationVector *outputVector);
154   int RequestData(
155       vtkInformation *request,
156       vtkInformationVector **inputVector,
157       vtkInformationVector *outputVector);
158   #else
159   void WriteSlice(vtkImageData *data);
160   #endif /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
161   int WriteGDCMData(vtkImageData *data, int timeStep);
162
163 protected:
164   virtual /*const*/ char *GetFileName();
165
166 private:
167   vtkGDCMImageWriter(const vtkGDCMImageWriter&); // Not implemented.
168   void operator=(const vtkGDCMImageWriter&); // Not implemented.
169
170   // VTK structs:
171   //vtkLookupTable *LookupTable;
172   vtkMedicalImageProperties *MedicalImageProperties;
173   char *StudyUID;
174   char *SeriesUID;
175
176   int DataUpdateExtent[6];
177   int ImageFormat;
178
179   vtkStringArray *FileNames;
180   vtkMatrix4x4 *DirectionCosines;
181
182   double Shift;
183   double Scale;
184   int FileLowerLeft;
185   int PlanarConfiguration;
186   int LossyFlag;
187   int CompressionType;
188 };
189
190 #endif

```

## 11.611 vtkGDCMMedicalImageProperties.h File Reference

```
#include "vtkgdcmModule.h"
```

```
#include "vtkMedicalImageProperties.h"
```

Include dependency graph for vtkGDCMMedicalImageProperties.h:

## Classes

- class [vtkGDCMMedicalImageProperties](#)

## Namespaces

- namespace [gdcm](#)

## 11.612 vtkGDCMMedicalImageProperties.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:   GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMMedicalImageProperties - some medical image properties.
15 // .SECTION Description
16 // vtkGDCMMedicalImageProperties is a helper class that can be used by medical
17 // image readers and applications to encapsulate medical image/acquisition
18 // properties. Later on, this should probably be extended to add
19 // any user-defined property.
20 // .SECTION See Also
21 // vtkMedicalImageReader2
22
23 #ifndef VTKGDCMMEDICALIMAGEPROPERTIES_H
24 #define VTKGDCMMEDICALIMAGEPROPERTIES_H
25
26 #include "vtkgdcmModule.h"
27 #include "vtkMedicalImageProperties.h"
28
29 class vtkGDCMMedicalImagePropertiesInternals;
30 //BTX
31 namespace gdcm { class File; }
32 //ETX
33
34 class VTKGDCM_EXPORT vtkGDCMMedicalImageProperties : public vtkMedicalImageProperties
35 {
36 public:
37     static vtkGDCMMedicalImageProperties *New();
38     vtkTypeMacro(vtkGDCMMedicalImageProperties, vtkMedicalImageProperties);
39     void PrintSelf(ostream& os, vtkIndent indent);
40
41     // Description:
42     // Convenience method to reset all fields to an empty string/value
43     virtual void Clear();
44
45     /*
46     // Description:
47     // Patient name
48     // For ex: DICOM (0010,0010) = DOE,JOHN
49     vtkSetStringMacro(PatientName);
50     vtkGetStringMacro(PatientName);
51
52     // Description:
53     // Patient ID
54     // For ex: DICOM (0010,0020) = 1933197
55     vtkSetStringMacro(PatientID);
56     vtkGetStringMacro(PatientID);
57
58     // Description:
59     // Patient age

```

```

60 // Format: nnnD, nnW, nnnM or nnnY (eventually nnD, nnW, nnY)
61 //       with D (day), M (month), W (week), Y (year)
62 // For ex: DICOM (0010,1010) = 031Y
63 vtkSetStringMacro(PatientAge);
64 vtkGetStringMacro(PatientAge);
65
66 // Description:
67 // Take as input a string in VR=AS (DICOM PS3.5) and extract either
68 // different fields namely: year month week day
69 // Return 0 on error, 1 on success
70 // One can test fields if they are different from -1 upon success
71 static int GetAgeAsFields(const char *age, int &year, int &month, int &week, int &day);
72
73 // For Tcl:
74 // From C++ use GetPatientAge + GetAgeAsField
75 // Those function parse a DICOM string, and return the value of the number expressed
76 // this is either expressed in year, month or days. Thus if a string is expressed in years
77 // GetPatientAgeDay/GetPatientAgeWeek/GetPatientAgeMonth will return 0
78 int GetPatientAgeYear();
79 int GetPatientAgeMonth();
80 int GetPatientAgeWeek();
81 int GetPatientAgeDay();
82
83 // Description:
84 // Patient sex
85 // For ex: DICOM (0010,0040) = M
86 vtkSetStringMacro(PatientSex);
87 vtkGetStringMacro(PatientSex);
88
89 // Description:
90 // Patient birth date
91 // Format: yyyymmdd
92 // For ex: DICOM (0010,0030) = 19680427
93 vtkSetStringMacro(PatientBirthDate);
94 vtkGetStringMacro(PatientBirthDate);
95
96 // For Tcl:
97 // From C++ use GetPatientBirthDate + GetDateAsFields
98 int GetPatientBirthDateYear();
99 int GetPatientBirthDateMonth();
100 int GetPatientBirthDateDay();
101
102 // Description:
103 // Study Date
104 // Format: yyyymmdd
105 // For ex: DICOM (0008,0020) = 20030617
106 vtkSetStringMacro(StudyDate);
107 vtkGetStringMacro(StudyDate);
108
109 // Description:
110 // Acquisition Date
111 // Format: yyyymmdd
112 // For ex: DICOM (0008,0022) = 20030617
113 vtkSetStringMacro(AcquisitionDate);
114 vtkGetStringMacro(AcquisitionDate);
115
116 // For Tcl:
117 // From C++ use GetAcquisitionDate + GetDateAsFields
118 int GetAcquisitionDateYear();
119 int GetAcquisitionDateMonth();
120 int GetAcquisitionDateDay();
121
122 // Description:
123 // Study Time
124 // Format: hhmmss.frac (any trailing component(s) can be omitted)
125 // For ex: DICOM (0008,0030) = 162552.0705 or 230012, or 0012
126 vtkSetStringMacro(StudyTime);
127 vtkGetStringMacro(StudyTime);
128
129 // Description:
130 // Acquisition time
131 // Format: hhmmss.frac (any trailing component(s) can be omitted)
132 // For ex: DICOM (0008,0032) = 162552.0705 or 230012, or 0012
133 vtkSetStringMacro(AcquisitionTime);
134 vtkGetStringMacro(AcquisitionTime);
135
136 // Description:
137 // Image Date aka Content Date
138 // Format: yyyymmdd
139 // For ex: DICOM (0008,0023) = 20030617
140 vtkSetStringMacro(ImageDate);

```

```
141 vtkGetStringMacro(ImageDate);
142
143 // For Tcl:
144 // From C++ use GetImageDate + GetDateAsFields
145 int GetImageDateYear();
146 int GetImageDateMonth();
147 int GetImageDateDay();
148
149 // Description:
150 // Take as input a string in ISO 8601 date (YYYY/MM/DD) and extract the
151 // different fields namely: year month day
152 // Return 0 on error, 1 on success
153 static int GetDateAsFields(const char *date, int &year, int &month, int &day);
154
155 // Description:
156 // Take as input a string in ISO 8601 date (YYYY/MM/DD) and construct a
157 // locale date based on the different fields (see GetDateAsFields to extract
158 // different fields)
159 // Return 0 on error, 1 on success
160 static int GetDateAsLocale(const char *date, char *locale);
161
162 // Description:
163 // Image Time
164 // Format: hhmmss.frac (any trailing component(s) can be omitted)
165 // For ex: DICOM (0008,0033) = 162552.0705 or 230012, or 0012
166 vtkGetStringMacro(ImageTime);
167 vtkGetStringMacro(ImageTime);
168
169 // Description:
170 // Image number
171 // For ex: DICOM (0020,0013) = 1
172 vtkGetStringMacro(ImageNumber);
173 vtkGetStringMacro(ImageNumber);
174
175 // Description:
176 // Series number
177 // For ex: DICOM (0020,0011) = 902
178 vtkGetStringMacro(SeriesNumber);
179 vtkGetStringMacro(SeriesNumber);
180
181 // Description:
182 // Series Description
183 // User provided description of the Series
184 // For ex: DICOM (0008,103e) = SCOUT
185 vtkGetStringMacro(SeriesDescription);
186 vtkGetStringMacro(SeriesDescription);
187
188 // Description:
189 // Study ID
190 // For ex: DICOM (0020,0010) = 37481
191 vtkGetStringMacro(StudyID);
192 vtkGetStringMacro(StudyID);
193
194 // Description:
195 // Study description
196 // For ex: DICOM (0008,1030) = BRAIN/C-SP/FACIAL
197 vtkGetStringMacro(StudyDescription);
198 vtkGetStringMacro(StudyDescription);
199
200 // Description:
201 // Modality
202 // For ex: DICOM (0008,0060)= CT
203 vtkGetStringMacro(Modality);
204 vtkGetStringMacro(Modality);
205
206 // Description:
207 // Manufacturer
208 // For ex: DICOM (0008,0070) = Siemens
209 vtkGetStringMacro(Manufacturer);
210 vtkGetStringMacro(Manufacturer);
211
212 // Description:
213 // Manufacturer's Model Name
214 // For ex: DICOM (0008,1090) = LightSpeed QX/i
215 vtkGetStringMacro(ManufacturerModelName);
216 vtkGetStringMacro(ManufacturerModelName);
217
218 // Description:
219 // Station Name
220 // For ex: DICOM (0008,1010) = LSPD_OC8
221 vtkGetStringMacro(StationName);
```

```
222 vtkGetStringMacro(StationName);
223
224 // Description:
225 // Institution Name
226 // For ex: DICOM (0008,0080) = FooCity Medical Center
227 vtkSetStringMacro(InstitutionName);
228 vtkGetStringMacro(InstitutionName);
229
230 // Description:
231 // Convolution Kernel (or algorithm used to reconstruct the data)
232 // For ex: DICOM (0018,1210) = Bone
233 vtkSetStringMacro(ConvolutionKernel);
234 vtkGetStringMacro(ConvolutionKernel);
235
236 // Description:
237 // Slice Thickness (Nominal reconstructed slice thickness, in mm)
238 // For ex: DICOM (0018,0050) = 0.273438
239 vtkSetStringMacro(SliceThickness);
240 vtkGetStringMacro(SliceThickness);
241 virtual double GetSliceThicknessAsDouble();
242
243 // Description:
244 // Peak kilo voltage output of the (x-ray) generator used
245 // For ex: DICOM (0018,0060) = 120
246 vtkSetStringMacro(KVP);
247 vtkGetStringMacro(KVP);
248
249 // Description:
250 // Gantry/Detector tilt (Nominal angle of tilt in degrees of the scanning
251 // gantry.)
252 // For ex: DICOM (0018,1120) = 15
253 vtkSetStringMacro(GantryTilt);
254 vtkGetStringMacro(GantryTilt);
255 virtual double GetGantryTiltAsDouble();
256
257 // Description:
258 // Echo Time
259 // (Time in ms between the middle of the excitation pulse and the peak of
260 // the echo produced)
261 // For ex: DICOM (0018,0081) = 105
262 vtkSetStringMacro(EchoTime);
263 vtkGetStringMacro(EchoTime);
264
265 // Description:
266 // Echo Train Length
267 // (Number of lines in k-space acquired per excitation per image)
268 // For ex: DICOM (0018,0091) = 35
269 vtkSetStringMacro(EchoTrainLength);
270 vtkGetStringMacro(EchoTrainLength);
271
272 // Description:
273 // Repetition Time
274 // The period of time in msec between the beginning of a pulse sequence and
275 // the beginning of the succeeding (essentially identical) pulse sequence.
276 // For ex: DICOM (0018,0080) = 2040
277 vtkSetStringMacro(RepetitionTime);
278 vtkGetStringMacro(RepetitionTime);
279
280 // Description:
281 // Exposure time (time of x-ray exposure in msec)
282 // For ex: DICOM (0018,1150) = 5
283 vtkSetStringMacro(ExposureTime);
284 vtkGetStringMacro(ExposureTime);
285
286 // Description:
287 // X-ray tube current (in mA)
288 // For ex: DICOM (0018,1151) = 400
289 vtkSetStringMacro(XRayTubeCurrent);
290 vtkGetStringMacro(XRayTubeCurrent);
291
292 // Description:
293 // Exposure (The exposure expressed in mAs, for example calculated
294 // from Exposure Time and X-ray Tube Current)
295 // For ex: DICOM (0018,1152) = 114
296 vtkSetStringMacro(Exposure);
297 vtkGetStringMacro(Exposure);
298
299 // Interface to allow insertion of user define values, for instance in DICOM one would want to
300 // store the Protocol Name (0018,1030), in this case one would do:
301 // AddUserDefinedValue( "Protocol Name", "T1W/SE/1024" );
302 void AddUserDefinedValue(const char *name, const char *value);
```



```

303 // Get a particular user value
304 const char *GetUserDefinedValue(const char *name);
305 // Get the number of user defined values
306 unsigned int GetNumberOfUserDefinedValues();
307 // Get a name/value by index
308 const char *GetUserDefinedNameByIndex(unsigned int idx);
309 const char *GetUserDefinedValueByIndex(unsigned int idx);
310
311 // Description:
312 // Copy the contents of p to this instance.
313 virtual void DeepCopy(vtkGDCMMedicalImageProperties *p);
314
315 // Description:
316 // Add/Remove/Query the window/level presets that may have been associated
317 // to a medical image. Window is also known as 'width', level is also known
318 // as 'center'. The same window/level pair can not be added twice.
319 // As a convenience, a comment (aka Explanation) can be associated to a preset.
320 // For ex: DICOM Window Center (0028,1050) = 00045\000470
321 //          DICOM Window Width (0028,1051) = 0106\03412
322 //          DICOM Window Center Width Explanation (0028,1055) = WINDOW1\WINDOW2
323 virtual void AddWindowLevelPreset(double w, double l);
324 virtual void RemoveWindowLevelPreset(double w, double l);
325 virtual void RemoveAllWindowLevelPresets();
326 virtual int GetNumberOfWindowLevelPresets();
327 virtual int HasWindowLevelPreset(double w, double l);
328 virtual int GetNthWindowLevelPreset(int idx, double *w, double *l);
329 virtual double* GetNthWindowLevelPreset(int idx);
330 virtual void SetNthWindowLevelPresetComment(int idx, const char *comment);
331 virtual const char* GetNthWindowLevelPresetComment(int idx);
332
333 // Description:
334 // Mapping from a sliceidx within a volumeidx into a DICOM Instance UID
335 // Some DICOM reader can populate this structure so that later on from a slice index
336 // in a vtkImageData volume we can backtrack and find out which 2d slice it was coming from
337 const char *GetInstanceUIDFromSliceID(int volumeidx, int sliceid);
338 void SetInstanceUIDFromSliceID(int volumeidx, int sliceid, const char *uid);
339
340 // Description:
341 // Provides the inverse mapping. Returns -1 if a slice for this uid is
342 // not found.
343 int GetSliceIDFromInstanceUID(int &volumeidx, const char *uid);
344
345 //BTX
346 typedef enum {
347   AXIAL = 0,
348   CORONAL,
349   SAGITTAL
350 } OrientationType;
351 //ETX
352 int GetOrientationType(int volumeidx);
353 void SetOrientationType(int volumeidx, int orientation);
354 static const char *GetStringFromOrientationType(unsigned int type);
355 */
356 protected:
357   vtkGDCMMedicalImageProperties();
358   ~vtkGDCMMedicalImageProperties();
359
360 //BTX
361   friend class vtkGDCMImageReader;
362   friend class vtkGDCMImageReader2;
363   friend class vtkGDCMImageWriter;
364   void PushBackFile(gdcm::File const &f);
365   gdcm::File const & GetFile(unsigned int t);
366 //ETX
367
368 private:
369   vtkGDCMMedicalImagePropertiesInternals *Internals;
370
371   vtkGDCMMedicalImageProperties(const vtkGDCMMedicalImageProperties&); // Not implemented.
372   void operator=(const vtkGDCMMedicalImageProperties&); // Not implemented.
373 };
374
375 #endif

```

## 11.613 vtkGDCMPolyDataReader.h File Reference

```
#include "vtkgdcmModule.h"
```

```
#include "vtkPolyDataAlgorithm.h"
```

Include dependency graph for vtkGDCMPolyDataReader.h:

### Classes

- class [vtkGDCMPolyDataReader](#)

### Namespaces

- namespace [gdcm](#)

## 11.614 vtkGDCMPolyDataReader.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMPolyDataReader - read DICOM PolyData files (Contour Data...)
15 // .SECTION Description
16 // For now only support RTSTRUCT (RT Structure Set Storage)
17 // .SECTION TODO
18 // Need to do the same job for DVH Sequence/DVH Data...
19 // .SECTION Warning
20 // When using vtkGDCMPolyDataReader in conjunction with vtkGDCMImageReader
21 // it is *required* that FileLowerLeft is set to ON as coordinate system
22 // would be inconsistent in between the two data structures.
23 //
24 // .SECTION See Also
25 // vtkGDCMImageReader vtkGDCMPolyDataWriter vtkRTStructSetProperties
26
27
28 #ifndef VTKGDCMPOLYDATAREADER_H
29 #define VTKGDCMPOLYDATAREADER_H
30
31 #include "vtkgdcmModule.h"
32 #include "vtkPolyDataAlgorithm.h"
33
34 class vtkMedicalImageProperties;
35 class vtkRTStructSetProperties;
36 //BTX
37 namespace gdcm { class Reader; }
38 //ETX
39 class VTKGDCM_EXPORT vtkGDCMPolyDataReader : public vtkPolyDataAlgorithm
40 {
41 public:
42     static vtkGDCMPolyDataReader *New();
43     vtkTypeMacro(vtkGDCMPolyDataReader,vtkPolyDataAlgorithm);
44     virtual void PrintSelf(ostream& os, vtkIndent indent);
45
46     // Description:
47     // Set/Get the filename of the file to be read
```

```

48  vtkSetStringMacro(FileName);
49  vtkGetStringMacro(FileName);
50
51  // Description:
52  // Get the medical image properties object
53  vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
54
55  vtkGetObjectMacro(RTStructSetProperties, vtkRTStructSetProperties);
56
57 protected:
58  vtkGDCMPolyDataReader();
59  ~vtkGDCMPolyDataReader();
60
61  char *FileName;
62  vtkMedicalImageProperties *MedicalImageProperties;
63  vtkRTStructSetProperties *RTStructSetProperties;
64  //BTX
65  void FillMedicalImageInformation(const gdcm::Reader &reader);
66  //ETX
67
68  int RequestData(vtkInformation *, vtkInformationVector **, vtkInformationVector *);
69  int RequestInformation(
70      vtkInformation *vtkNotUsed(request),
71      vtkInformationVector **vtkNotUsed(inputVector),
72      vtkInformationVector *outputVector);
73  //BTX
74  int RequestInformation_RTStructureSetStorage(gdcm::Reader const & reader);
75  int RequestData_RTStructureSetStorage(gdcm::Reader const &reader, vtkInformationVector *outputVector);
76  int RequestInformation_HemodynamicWaveformStorage(gdcm::Reader const & reader);
77  int RequestData_HemodynamicWaveformStorage(gdcm::Reader const &reader, vtkInformationVector *outputVector);
78  //ETX
79
80 private:
81  vtkGDCMPolyDataReader(const vtkGDCMPolyDataReader&); // Not implemented.
82  void operator=(const vtkGDCMPolyDataReader&); // Not implemented.
83 };
84
85 #endif

```

## 11.615 vtkGDCMPolyDataWriter.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkPolyDataWriter.h"
#include "vtkStringArray.h"
#include "vtkStdString.h"

```

Include dependency graph for vtkGDCMPolyDataWriter.h:

### Classes

- class [vtkGDCMPolyDataWriter](#)

### Namespaces

- namespace [gdcm](#)

## 11.616 vtkGDCMPolyDataWriter.h

[Go to the documentation of this file.](#)

```

1  /*****
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 *****/
14 // .NAME vtkGDCMPolyDataWriter - writer DICOM PolyData files (Contour Data...)
15 // .SECTION Description
16 // For now only support RTSTRUCT (RT Structure Set Storage)
17 // .SECTION TODO
18 // Need to do the same job for DVH Sequence/DVH Data...
19 // .SECTION Warning
20 //
21 // .SECTION See Also
22 // vtkGDCMImageReader vtkGDCMPolyDataReader vtkRTStructSetProperties
23
24
25 #ifndef VTKGDCMPOLYDATAWRITER_H
26 #define VTKGDCMPOLYDATAWRITER_H
27
28 #include "vtkgdcmModule.h"
29 #include "vtkPolyDataWriter.h"
30 #include "vtkStringArray.h"
31 #include "vtkStdString.h"
32
33
34 class vtkMedicalImageProperties;
35 class vtkRTStructSetProperties;
36 //BTX
37 namespace gdcm { class File; }
38 //ETX
39 class VTKGDCM_EXPORT vtkGDCMPolyDataWriter : public vtkPolyDataWriter
40 {
41 public:
42     static vtkGDCMPolyDataWriter *New();
43     vtkTypeMacro(vtkGDCMPolyDataWriter, vtkPolyDataWriter);
44     virtual void PrintSelf(ostream& os, vtkIndent indent);
45
46     // Description:
47     // Set/Get the filename of the file to be read
48     // vtkSetStringMacro(FileName);
49     // vtkGetStringMacro(FileName);
50
51     // Description:
52     // Get the medical image properties object
53     // vtkGetObjectMacro(MedicalImageProperties, vtkMedicalImageProperties);
54     virtual void SetMedicalImageProperties(vtkMedicalImageProperties *pd);
55
56     virtual void SetRTStructSetProperties(vtkRTStructSetProperties *pd);
57
58
59     //this function will initialize the contained rtstructset with
60     //the inputs of the writer and the various extra information
61     //necessary for writing a complete rtstructset.
62     //NOTE: inputs must be set BEFORE calling this function!
63     //NOTE: the number of outputs for the appendpolydata MUST MATCH the ROI vectors!
64     void InitializeRTStructSet(vtkStdString inDirectory,
65                               vtkStdString inStructLabel, vtkStdString inStructName,
66                               vtkStringArray* inROINames,
67                               vtkStringArray* inROIAlgorithmName,
68                               vtkStringArray* inROIType);
69
70     // make parent class public...
71     void SetNumberOfInputPorts(int n);
72
73 protected:
74     vtkGDCMPolyDataWriter();
75     ~vtkGDCMPolyDataWriter();
76

```

```

77  vtkMedicalImageProperties *MedicalImageProperties;
78  vtkRTStructSetProperties *RTStructSetProperties;
79
80  void WriteData();
81  //BTX
82  void WriteRTSTRUCTInfo(gdcm::File &file);
83  void WriteRTSTRUCTData(gdcm::File &file, int num);
84  //ETX
85
86  private:
87  vtkGDCMPolyDataWriter(const vtkGDCMPolyDataWriter&); // Not implemented.
88  void operator=(const vtkGDCMPolyDataWriter&); // Not implemented.
89  };
90
91 #endif

```

## 11.617 vtkGDCMTesting.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkObject.h"

```

Include dependency graph for vtkGDCMTesting.h:

### Classes

- class [vtkGDCMTesting](#)

## 11.618 vtkGDCMTesting.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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6  All rights reserved.
7  See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMTesting - GDCM Testing
15 // .SECTION Description
16 // GDCM Testing
17
18 // .SECTION See Also
19 // vtkTesting
20
21 #ifndef VTKGDCMTESTING_H
22 #define VTKGDCMTESTING_H
23
24 #include "vtkgdcmModule.h"
25 #include "vtkObject.h"
26
27 class VTKGDCM_EXPORT vtkGDCMTesting : public vtkObject
28 {
29 public:
30  static vtkGDCMTesting *New();
31  vtkTypeMacro(vtkGDCMTesting,vtkObject);
32  void PrintSelf(ostream& os, vtkIndent indent);
33
34  static const char *GetVTKDataRoot();
35  static const char *GetGDCMDataRoot();

```

```

36
37 //BTX
38 typedef const char* const (*MD5MetaImagesType)[3];
39 static const char * const * GetMD5MetaImage(unsigned int file);
40 //ETX
41 static unsigned int GetNumberOfMD5MetaImages();
42
43 static const char * GetMHDMD5FromFile(const char *filepath);
44 static const char * GetRAWMD5FromFile(const char *filepath);
45
46 protected:
47   vtkGDCMTesting();
48   ~vtkGDCMTesting();
49
50 private:
51   vtkGDCMTesting(const vtkGDCMTesting&); // Not implemented.
52   void operator=(const vtkGDCMTesting&); // Not implemented.
53 };
54
55 #endif

```

## 11.619 vtkGDCMThreadedImageReader.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkGDCMImageReader.h"
#include "vtkVersion.h"

```

Include dependency graph for vtkGDCMThreadedImageReader.h:

### Classes

- class [vtkGDCMThreadedImageReader](#)

## 11.620 vtkGDCMThreadedImageReader.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
6 All rights reserved.
7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkGDCMThreadedImageReader - read DICOM files with multiple threads
15 // .SECTION Description
16 // vtkGDCMThreadedImageReader is a source object that reads some DICOM files
17 // This reader is threaded.  Meaning that on a multiple core CPU with N cpu, it will
18 // read approx N times faster than when reading in a single thread.
19 //
20 // .SECTION Warning:  Advanced users only.  Do not use this class in the general case,
21 // you have to understand how physically medium works first (sequential reading for
22 // instance) before playing with this class
23 //
24 // .SECTION Implementation note:  when FileLowerLeft is set to on the image is not flipped
25 // upside down as VTK would expect, use this option only if you know what you are doing
26 //
27 // .SECTION FIXME: need to implement the other mode where FileLowerLeft is set to OFF
28 //

```

```

29 // .SECTION FIXME: you need to call SetFileName when reading a volume file (multiple slices DICOM)
30 // since SetFileNames expect each single file to be single slice (see parent class)
31 //
32 // .SECTION BUG: you should really consider using vtkGDCMThreadedImageReader2 instead !
33 //
34 // .SECTION See Also
35 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMThreadedImageReader2
36
37 #ifndef VTKGDCMTHREADEDIMAGEREADER_H
38 #define VTKGDCMTHREADEDIMAGEREADER_H
39
40 #include "vtkgdcmodule.h"
41 #include "vtkGDCMImageReader.h"
42 #include "vtkVersion.h"
43
44 class VTKGDCM_EXPORT vtkGDCMThreadedImageReader : public vtkGDCMImageReader
45 {
46 public:
47     static vtkGDCMThreadedImageReader *New();
48     vtkTypeMacro(vtkGDCMThreadedImageReader,vtkGDCMImageReader);
49     virtual void PrintSelf(ostream& os, vtkIndent indent);
50
51     // Description:
52     // Explicitly set the Rescale Intercept (0028,1052)
53     vtkSetMacro(Shift,double);
54
55     // Description:
56     // Explicitly get/set the Rescale Slope (0028,1053)
57     vtkSetMacro(Scale,double);
58
59     // Description:
60     // Determine whether or not reader should use value from Shift/Scale
61     // Default is 1
62     vtkSetMacro(UseShiftScale,int);
63     vtkGetMacro(UseShiftScale,int);
64     vtkBooleanMacro(UseShiftScale,int);
65
66     // Within this class this is allowed to set the Number of Overlays from outside
67     //vtkSetMacro(NumberOfOverlays,int);
68
69 protected:
70     vtkGDCMThreadedImageReader();
71     ~vtkGDCMThreadedImageReader();
72
73 #if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
74     int RequestInformation(vtkInformation *request,
75                           vtkInformationVector **inputVector,
76                           vtkInformationVector *outputVector);
77     int RequestData(vtkInformation *request,
78                    vtkInformationVector **inputVector,
79                    vtkInformationVector *outputVector);
80 #else /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
81     void ExecuteInformation();
82     void ExecuteData(vtkDataObject *out);
83 #endif /*(VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )*/
84
85     void ReadFiles(unsigned int nfiles, const char *filenames[]);
86     void RequestDataCompat();
87
88 private:
89     vtkGDCMThreadedImageReader(const vtkGDCMThreadedImageReader&); // Not implemented.
90     void operator=(const vtkGDCMThreadedImageReader&); // Not implemented.
91
92     int UseShiftScale;
93 };
94
95 #endif

```

## 11.621 vtkGDCMThreadedImageReader2.h File Reference

```

#include "vtkgdcmodule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkGDCMThreadedImageReader2.h:

## Classes

- class [vtkGDCMThreadedImageReader2](#)

## 11.622 vtkGDCMThreadedImageReader2.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
5  Copyright (c) 2006-2011 Mathieu Malaterre
6  All rights reserved.
7  See Copyright.txt or http://gdcml.sourceforge.net/Copyright.html for details.
8
9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13  =====*/
14 // .NAME vtkGDCMThreadedImageReader2 - read DICOM files with multiple threads
15 // .SECTION Description
16 // vtkGDCMThreadedImageReader2 is a source object that reads some DICOM files
17 // This reader is threaded.  Meaning that on a multiple core CPU with N cpu, it will
18 // read approx N times faster than when reading in a single thread assuming the IO is
19 // not a bottleneck operation.
20 // If looking for a single threaded class see:  vtkGDCMImageReader
21 //
22 // .SECTION Warning:  Advanced users only.  Do not use this class in the general case,
23 // you have to understand how physically medium works first (sequential reading for
24 // instance) before playing with this class
25 //
26 // .SECTION Implementation note:  when FileLowerLeft is set to on the image is not flipped
27 // upside down as VTK would expect, use this option only if you know what you are doing
28 //
29 // .SECTION FIXME: need to implement the other mode where FileLowerLeft is set to OFF
30 //
31 // .SECTION FIXME: need to implement reading of series of 3D files
32 //
33 // .SECTION Implementation note:  this class is meant to supersede vtkGDCMThreadedImageReader
34 // because it had support for ProgressEvent support even from python layer.  There is a
35 // subtle trick down in the threading mechanism in VTK were the main thread (talking to the
36 // python interpreter) is also part of the execution process (and the N-1 other thread
37 // are just there to execute the remaining of ThreadedRequestData), this separation into
38 // two types of thread is necessary to achieve a working implementation of UpdateProgress
39
40 // .SECTION See Also
41 // vtkMedicalImageReader2 vtkMedicalImageProperties vtkGDCMImageReader
42
43 #ifndef VTKGDCMTHREADEDIMAGEREADER2_H
44 #define VTKGDCMTHREADEDIMAGEREADER2_H
45
46 #include "vtkgdcmModule.h"
47 #include "vtkThreadedImageAlgorithm.h"
48
49 class vtkStringArray;
50 class VTKGDCM_EXPORT vtkGDCMThreadedImageReader2 : public vtkThreadedImageAlgorithm
51 {
52 public:
53     static vtkGDCMThreadedImageReader2 *New();
54     vtkTypeMacro(vtkGDCMThreadedImageReader2,vtkThreadedImageAlgorithm);
55     virtual void PrintSelf(ostream& os, vtkIndent indent);
56
57     vtkGetMacro(FileLowerLeft,int);
58     vtkSetMacro(FileLowerLeft,int);
59     vtkBooleanMacro(FileLowerLeft,int);
60
61     vtkGetMacro(NumberOfOverlays,int);
62
63     vtkSetMacro(DataScalarType,int);
64     vtkGetMacro(DataScalarType,int);
65
66     vtkSetMacro(NumberOfScalarComponents,int);
67     vtkGetMacro(NumberOfScalarComponents,int);

```



```

68
69   vtkGetMacro(LoadOverlays,int);
70   vtkSetMacro(LoadOverlays,int);
71   vtkBooleanMacro(LoadOverlays,int);
72
73   vtkSetVector6Macro(DataExtent,int);
74   vtkGetVector6Macro(DataExtent,int);
75
76   vtkSetVector3Macro(DataOrigin,double);
77   vtkGetVector3Macro(DataOrigin,double);
78
79   vtkSetVector3Macro(DataSpacing,double);
80   vtkGetVector3Macro(DataSpacing,double);
81
82   //vtkGetStringMacro(FileName);
83   //vtkSetStringMacro(FileName);
84   virtual const char *GetFileName(int i = 0);
85   virtual void SetFileName(const char *filename);
86
87   virtual void SetFileNames(vtkStringArray*);
88   vtkGetObjectMacro(FileNames, vtkStringArray);
89
90   int SplitExtent(int splitExt[6], int startExt[6],
91                   int num, int total);
92
93   // Description:
94   // Explicitly set the Rescale Intercept (0028,1052)
95   vtkSetMacro(Shift,double);
96   vtkGetMacro(Shift,double);
97
98   // Description:
99   // Explicitly get/set the Rescale Slope (0028,1053)
100  vtkSetMacro(Scale,double);
101  vtkGetMacro(Scale,double);
102
103  // Description:
104  // Determine whether or not reader should use value from Shift/Scale
105  // Default is 1
106  vtkSetMacro(UseShiftScale,int);
107  vtkGetMacro(UseShiftScale,int);
108  vtkBooleanMacro(UseShiftScale,int);
109
110 protected:
111   vtkGDCMThreadedImageReader2();
112   ~vtkGDCMThreadedImageReader2();
113
114   int RequestInformation(vtkInformation *request,
115                         vtkInformationVector **inputVector,
116                         vtkInformationVector *outputVector);
117
118 protected:
119   void ThreadedRequestData (
120     vtkInformation * request,
121     vtkInformationVector** inputVector,
122     vtkInformationVector * outputVector,
123     vtkImageData ***inData,
124     vtkImageData **outData,
125     int outExt[6], int id);
126
127 private:
128   int FileLowerLeft;
129   char *FileName;
130   vtkStringArray *FileNames;
131   int LoadIconImage;
132   int DataExtent[6];
133   int LoadOverlays;
134   int NumberOfOverlays;
135   int DataScalarType;
136
137   int NumberOfScalarComponents;
138   double DataSpacing[3];
139   double DataOrigin[3];
140   int IconImageDataExtent[6];
141
142   double Shift;
143   double Scale;
144   int UseShiftScale;
145
146 private:
147   vtkGDCMThreadedImageReader2(const vtkGDCMThreadedImageReader2&); // Not implemented.
148   void operator=(const vtkGDCMThreadedImageReader2&); // Not implemented.

```

```

149 };
150
151 #endif

```

## 11.623 vtkImageColorViewer.h File Reference

```

#include "vtkgdcModule.h"
#include "vtkObject.h"
#include "vtkVersion.h"

```

Include dependency graph for vtkImageColorViewer.h:

### Classes

- class [vtkImageColorViewer](#)

## 11.624 vtkImageColorViewer.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library
4
5 Copyright (c) 2006-2011 Mathieu Malaterre
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7 See Copyright.txt or http://gdcm.sourceforge.net/Copyright.html for details.
8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkImageColorViewer - Display a 2D image.
15 // .SECTION Description
16 // vtkImageColorViewer is a convenience class for displaying a 2D image.  It
17 // packages up the functionality found in vtkRenderWindow, vtkRenderer,
18 // vtkImageActor and vtkImageMapToWindowLevelColors into a single easy to use
19 // class.  This class also creates an image interactor style
20 // (vtkInteractorStyleImage) that allows zooming and panning of images, and
21 // supports interactive window/level operations on the image. Note that
22 // vtkImageColorViewer is simply a wrapper around these classes.
23 //
24 // vtkImageColorViewer uses the 3D rendering and texture mapping engine
25 // to draw an image on a plane.  This allows for rapid rendering,
26 // zooming, and panning.  The image is placed in the 3D scene at a
27 // depth based on the z-coordinate of the particular image slice.  Each
28 // call to SetSlice() changes the image data (slice) displayed AND
29 // changes the depth of the displayed slice in the 3D scene.  This can
30 // be controlled by the AutoAdjustCameraClippingRange ivar of the
31 // InteractorStyle member.
32 //
33 // It is possible to mix images and geometry, using the methods:
34 //
35 // viewer->SetInput( myImage );
36 // viewer->GetRenderer()->AddActor( myActor );
37 //
38 // This can be used to annotate an image with a PolyData of "edges" or
39 // or highlight sections of an image or display a 3D isosurface
40 // with a slice from the volume, etc. Any portions of your geometry
41 // that are in front of the displayed slice will be visible; any
42 // portions of your geometry that are behind the displayed slice will
43 // be obscured. A more general framework (with respect to viewing
44 // direction) for achieving this effect is provided by the
45 // vtkImagePlaneWidget .

```

```

46 //
47 // Note that pressing 'r' will reset the window/level and pressing
48 // shift+'r' or control+'r' will reset the camera.
49 //
50 // .SECTION See Also
51 // vtkRenderWindow vtkRenderer vtkImageActor vtkImageMapToWindowLevelColors
52
53 #ifndef VTKIMAGECOLORVIEWER_H
54 #define VTKIMAGECOLORVIEWER_H
55
56 #include "vtkgdcmModule.h"
57 #include "vtkObject.h"
58 #include "vtkVersion.h"
59
60 class vtkAlgorithm;
61 class vtkAlgorithmOutput;
62 class vtkImageActor;
63 class vtkImageData;
64 class vtkImageMapToWindowLevelColors2;
65 class vtkInformation;
66 class vtkInteractorStyleImage;
67 class vtkRenderWindow;
68 class vtkRenderer;
69 class vtkRenderWindowInteractor;
70 class vtkPolyData;
71
72 class VTKGDCM_EXPORT vtkImageColorViewer : public vtkObject
73 {
74 public:
75     static vtkImageColorViewer *New();
76     vtkTypeMacro(vtkImageColorViewer,vtkObject);
77     void PrintSelf(ostream& os, vtkIndent indent);
78
79     // Description:
80     // Get the name of rendering window.
81     virtual const char *GetWindowName();
82
83     // Description:
84     // Render the resulting image.
85     virtual void Render(void);
86
87     // Description:
88     // Set/Get the input image to the viewer.
89     #if (VTK_MAJOR_VERSION >= 6)
90     virtual void SetInputData(vtkImageData *in);
91     #else
92     virtual void SetInput(vtkImageData *in);
93     #endif
94     virtual vtkImageData *GetInput();
95     virtual void SetInputConnection(vtkAlgorithmOutput* input);
96     virtual void AddInputConnection(vtkAlgorithmOutput* input);
97     virtual void AddInput(vtkImageData * input);
98     //virtual void AddInput(vtkPolyData * input);
99
100     double GetOverlayVisibility();
101     void SetOverlayVisibility(double vis);
102
103     // Description:
104     // Set/get the slice orientation
105     //BTX
106     enum
107     {
108         SLICE_ORIENTATION_YZ = 0,
109         SLICE_ORIENTATION_XZ = 1,
110         SLICE_ORIENTATION_XY = 2
111     };
112     //ETX
113     vtkGetMacro(SliceOrientation, int);
114     virtual void SetSliceOrientation(int orientation);
115     virtual void SetSliceOrientationToXY()
116     { this->SetSliceOrientation(vtkImageColorViewer::SLICE_ORIENTATION_XY); };
117     virtual void SetSliceOrientationToYZ()
118     { this->SetSliceOrientation(vtkImageColorViewer::SLICE_ORIENTATION_YZ); };
119     virtual void SetSliceOrientationToXZ()
120     { this->SetSliceOrientation(vtkImageColorViewer::SLICE_ORIENTATION_XZ); };
121
122     // Description:
123     // Set/Get the current slice to display (depending on the orientation
124     // this can be in X, Y or Z).
125     vtkGetMacro(Slice, int);
126     virtual void SetSlice(int s);

```

```

127
128 // Description:
129 // Update the display extent manually so that the proper slice for the
130 // given orientation is displayed. It will also try to set a
131 // reasonable camera clipping range.
132 // This method is called automatically when the Input is changed, but
133 // most of the time the input of this class is likely to remain the same,
134 // i.e. connected to the output of a filter, or an image reader. When the
135 // input of this filter or reader itself is changed, an error message might
136 // be displayed since the current display extent is probably outside
137 // the new whole extent. Calling this method will ensure that the display
138 // extent is reset properly.
139 virtual void UpdateDisplayExtent();
140
141 // Description:
142 // Return the minimum and maximum slice values (depending on the orientation
143 // this can be in X, Y or Z).
144 virtual int GetSliceMin();
145 virtual int GetSliceMax();
146 virtual void GetSliceRange(int range[2])
147     { this->GetSliceRange(range[0], range[1]); }
148 virtual void GetSliceRange(int &min, int &max);
149 virtual int* GetSliceRange();
150
151 // Description:
152 // Set window and level for mapping pixels to colors.
153 virtual double GetColorWindow();
154 virtual double GetColorLevel();
155 virtual void SetColorWindow(double s);
156 virtual void SetColorLevel(double s);
157
158 // Description:
159 // These are here when using a Tk window.
160 virtual void SetDisplayId(void *a);
161 virtual void SetWindowId(void *a);
162 virtual void SetParentId(void *a);
163
164 // Description:
165 // Set/Get the position in screen coordinates of the rendering window.
166 virtual int* GetPosition();
167 virtual void SetPosition(int a,int b);
168 virtual void SetPosition(int a[2]) { this->SetPosition(a[0],a[1]); }
169
170 // Description:
171 // Set/Get the size of the window in screen coordinates in pixels.
172 virtual int* GetSize();
173 virtual void SetSize(int a, int b);
174 virtual void SetSize(int a[2]) { this->SetSize(a[0],a[1]); }
175
176 // Description:
177 // Get the internal render window, renderer, image actor, and
178 // image map instances.
179 vtkGetObjectMacro(RenderWindow,vtkRenderWindow);
180 vtkGetObjectMacro(Renderer, vtkRenderer);
181 vtkGetObjectMacro(ImageActor,vtkImageActor);
182 vtkGetObjectMacro(WindowLevel,vtkImageMapToWindowLevelColors2);
183 vtkGetObjectMacro(InteractorStyle,vtkInteractorStyleImage);
184
185 // Description:
186 // Set your own renderwindow and renderer
187 virtual void SetRenderWindow(vtkRenderWindow *arg);
188 virtual void SetRenderer(vtkRenderer *arg);
189
190 // Description:
191 // Attach an interactor for the internal render window.
192 virtual void SetupInteractor(vtkRenderWindowInteractor*);
193
194 // Description:
195 // Create a window in memory instead of on the screen. This may not
196 // be supported for every type of window and on some windows you may
197 // need to invoke this prior to the first render.
198 virtual void SetOffScreenRendering(int);
199 virtual int GetOffScreenRendering();
200 vtkBooleanMacro(OffScreenRendering,int);
201
202 // Description:
203 // @deprecated Replaced by vtkImageColorViewer::GetSliceMin() as of VTK 5.0.
204 VTK_LEGACY(int GetWholeZMin());
205
206 // Description:
207 // @deprecated Replaced by vtkImageColorViewer::GetSliceMax() as of VTK 5.0.

```

```

208   VTK_LEGACY(int GetWholeZMax());
209
210   // Description:
211   // @deprecated Replaced by vtkImageColorViewer::GetSlice() as of VTK 5.0.
212   VTK_LEGACY(int GetZSlice());
213
214   // Description:
215   // @deprecated Replaced by vtkImageColorViewer::SetSlice() as of VTK 5.0.
216   VTK_LEGACY(void SetZSlice(int));
217
218 protected:
219   vtkImageColorViewer();
220   ~vtkImageColorViewer();
221
222   virtual void InstallPipeline();
223   virtual void UnInstallPipeline();
224
225   vtkImageMapToWindowLevelColors2 *WindowLevel;
226   vtkRenderWindow *RenderWindow;
227   vtkRenderer *Renderer;
228   vtkImageActor *ImageActor;
229   vtkImageActor *OverlayImageActor;
230   vtkRenderWindowInteractor *Interactor;
231   vtkInteractorStyleImage *InteractorStyle;
232
233   int SliceOrientation;
234   int FirstRender;
235   int Slice;
236
237   virtual void UpdateOrientation();
238
239   #if (VTK_MAJOR_VERSION >= 6)
240   vtkAlgorithm* GetInputAlgorithm();
241   vtkInformation* GetInputInformation();
242   #endif
243
244   friend class vtkImageColorViewerCallback;
245
246 private:
247   vtkImageColorViewer(const vtkImageColorViewer&); // Not implemented.
248   void operator=(const vtkImageColorViewer&); // Not implemented.
249 };
250
251 #endif

```

## 11.625 vtkImageMapToColors16.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkImageMapToColors16.h:

### Classes

- class [vtkImageMapToColors16](#)

## 11.626 vtkImageMapToColors16.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
4
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```

```

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8
9 This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 /*=====
15
16 Portions of this file are subject to the VTK Toolkit Version 3 copyright.
17
18 Program:      Visualization Toolkit
19 Module:      $RCSfile: vtkImageMapToColors16.h,v $
20
21 Copyright (c) Ken Martin, Will Schroeder, Bill Lorensen
22 All rights reserved.
23 See Copyright.txt or http://www.kitware.com/Copyright.htm for details.
24
25 This software is distributed WITHOUT ANY WARRANTY; without even
26 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 // .NAME vtkImageMapToColors16 - map the input image through a lookup table
31 // .SECTION Description
32 // The vtkImageMapToColors16 filter will take an input image of any valid
33 // scalar type, and map the first component of the image through a
34 // lookup table. The result is an image of type VTK_UNSIGNED_CHAR.
35 // If the lookup table is not set, or is set to NULL, then the input
36 // data will be passed through if it is already of type VTK_UNSIGNED_CHAR.
37
38 // .SECTION See Also
39 // vtkLookupTable vtkScalarsToColors
40
41 #ifndef VTKIMAGEMAPTOCOLORS16_H
42 #define VTKIMAGEMAPTOCOLORS16_H
43
44
45 #include "vtkgdcmModule.h"
46 #include "vtkThreadedImageAlgorithm.h"
47
48 class vtkScalarsToColors;
49
50 class VTKGDCM_EXPORT vtkImageMapToColors16 : public vtkThreadedImageAlgorithm
51 {
52 public:
53     static vtkImageMapToColors16 *New();
54     vtkTypeMacro(vtkImageMapToColors16,vtkThreadedImageAlgorithm);
55     void PrintSelf(ostream& os, vtkIndent indent);
56
57     // Description:
58     // Set the lookup table.
59     virtual void SetLookupTable(vtkScalarsToColors*);
60     vtkGetObjectMacro(LookupTable,vtkScalarsToColors);
61
62     // Description:
63     // Set the output format, the default is RGBA.
64     vtkSetMacro(OutputFormat,int);
65     vtkGetMacro(OutputFormat,int);
66     void SetOutputFormatToRGBA() { this->OutputFormat = VTK_RGBA; };
67     void SetOutputFormatToRGB() { this->OutputFormat = VTK_RGB; };
68     void SetOutputFormatToLuminanceAlpha() { this->OutputFormat = VTK_LUMINANCE_ALPHA; };
69     void SetOutputFormatToLuminance() { this->OutputFormat = VTK_LUMINANCE; };
70
71     // Description:
72     // Set the component to map for multi-component images (default: 0)
73     vtkSetMacro(ActiveComponent,int);
74     vtkGetMacro(ActiveComponent,int);
75
76     // Description:
77     // Use the alpha component of the input when computing the alpha component
78     // of the output (useful when converting monochrome+alpha data to RGBA)
79     vtkSetMacro(PassAlphaToOutput,int);
80     vtkBooleanMacro(PassAlphaToOutput,int);
81     vtkGetMacro(PassAlphaToOutput,int);
82
83     // Description:
84     // We need to check the modified time of the lookup table too.
85 #ifndef VTK_HAS_MTIME_TYPE
86     virtual vtkMTimeType GetMTime();
87 #else

```

```

88     virtual unsigned long GetMTime();
89 #endif
90
91 protected:
92     vtkImageMapToColors16();
93     ~vtkImageMapToColors16();
94
95     virtual int RequestInformation (vtkInformation *, vtkInformationVector **, vtkInformationVector *);
96
97     void ThreadedRequestData(vtkInformation *request,
98                             vtkInformationVector **inputVector,
99                             vtkInformationVector *outputVector,
100                             vtkImageData ***inData, vtkImageData **outData,
101                             int extent[6], int id);
102
103     virtual int RequestData(vtkInformation *request,
104                             vtkInformationVector **inputVector,
105                             vtkInformationVector *outputVector);
106
107     vtkScalarsToColors *LookupTable;
108     int OutputFormat;
109
110     int ActiveComponent;
111     int PassAlphaToOutput;
112
113     int DataWasPassed;
114 private:
115     vtkImageMapToColors16(const vtkImageMapToColors16&); // Not implemented.
116     void operator=(const vtkImageMapToColors16&); // Not implemented.
117 };
118
119 #endif

```

## 11.627 vtkImageMapToWindowLevelColors2.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkImageMapToColors.h"

```

Include dependency graph for vtkImageMapToWindowLevelColors2.h:

### Classes

- class [vtkImageMapToWindowLevelColors2](#)

## 11.628 vtkImageMapToWindowLevelColors2.h

[Go to the documentation of this file.](#)

```

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2
3  Program:  GDCM (Grassroots DICOM). A DICOM library
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9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 /*=====
15
16 Portions of this file are subject to the VTK Toolkit Version 3 copyright.
17
18 Program:      Visualization Toolkit

```

```

19 Module:          $RCSfile:  vtkImageMapToWindowLevelColors2.h,v $
20
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22 All rights reserved.
23 See Copyright.txt or http://www.kitware.com/Copyright.htm for details.
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25 This software is distributed WITHOUT ANY WARRANTY; without even
26 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 // .NAME vtkImageMapToWindowLevelColors2 - map the input image through a lookup table and window / level it
31 // .SECTION Description
32 // The vtkImageMapToWindowLevelColors2 filter will take an input image of any
33 // valid scalar type, and map the first component of the image through a
34 // lookup table. This resulting color will be modulated with value obtained
35 // by a window / level operation. The result is an image of type
36 // VTK_UNSIGNED_CHAR. If the lookup table is not set, or is set to NULL, then
37 // the input data will be passed through if it is already of type
38 // UNSIGNED_CHAR.
39 //
40 // .SECTION See Also
41 // vtkLookupTable vtkScalarsToColors
42
43 #ifndef VTKIMAGEMAPTOWINDOWLEVELCOLORS2_H
44 #define VTKIMAGEMAPTOWINDOWLEVELCOLORS2_H
45
46 #include "vtkgdcmModule.h"
47 #include "vtkImageMapToColors.h"
48
49 class VTKGDCM_EXPORT vtkImageMapToWindowLevelColors2 : public vtkImageMapToColors
50 {
51 public:
52     static vtkImageMapToWindowLevelColors2 *New();
53     vtkTypeMacro(vtkImageMapToWindowLevelColors2,vtkImageMapToColors);
54     void PrintSelf(ostream& os, vtkIndent indent);
55
56     // Description:
57     // Set / Get the Window to use -> modulation will be performed on the
58     // color based on  $(S - (L - W/2))/W$  where S is the scalar value, L is
59     // the level and W is the window.
60     vtkSetMacro( Window, double );
61     vtkGetMacro( Window, double );
62
63     // Description:
64     // Set / Get the Level to use -> modulation will be performed on the
65     // color based on  $(S - (L - W/2))/W$  where S is the scalar value, L is
66     // the level and W is the window.
67     vtkSetMacro( Level, double );
68     vtkGetMacro( Level, double );
69
70 protected:
71     vtkImageMapToWindowLevelColors2();
72     ~vtkImageMapToWindowLevelColors2();
73
74     virtual int RequestInformation (vtkInformation *, vtkInformationVector **, vtkInformationVector *);
75     void ThreadedRequestData(vtkInformation *request,
76                             vtkInformationVector **inputVector,
77                             vtkInformationVector *outputVector,
78                             vtkImageData **inData, vtkImageData **outData,
79                             int extent[6], int id);
80     virtual int RequestData(vtkInformation *request,
81                             vtkInformationVector **inputVector,
82                             vtkInformationVector *outputVector);
83
84     double Window;
85     double Level;
86
87 private:
88     vtkImageMapToWindowLevelColors2(const vtkImageMapToWindowLevelColors2&); // Not implemented.
89     void operator=(const vtkImageMapToWindowLevelColors2&); // Not implemented.
90 };
91
92 #endif

```



## 11.629 vtkImagePlanarComponentsToComponents.h File Reference

```
#include "vtkgdcModule.h"
```

```
#include "vtkImageAlgorithm.h"
```

Include dependency graph for vtkImagePlanarComponentsToComponents.h:

### Classes

- class [vtkImagePlanarComponentsToComponents](#)

## 11.630 vtkImagePlanarComponentsToComponents.h

[Go to the documentation of this file.](#)

```
1 /*=====
2
3 Program:   GDCM (Grassroots DICOM). A DICOM library
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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 /*=====
15
16 Portions of this file are subject to the VTK Toolkit Version 3 copyright.
17
18 Program:   Visualization Toolkit
19 Module:    $RCSfile: vtkImagePlanarComponentsToComponents.h,v $
20
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25 This software is distributed WITHOUT ANY WARRANTY; without even
26 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 // .NAME vtkImagePlanarComponentsToComponents - Converts planar comp to pixel comp
31 // .SECTION Description
32
33 // .SECTION See Also
34 // TODO: Can I make this filter threaded ?
35 // TODO: How do I handle the VTK-flipping (FileLowerLeft)?
36
37 #ifndef VTKIMAGEPLANARCOMPONENTSTOCOMPONENTS_H
38 #define VTKIMAGEPLANARCOMPONENTSTOCOMPONENTS_H
39
40 #include "vtkgdcModule.h"
41 #include "vtkImageAlgorithm.h"
42
43 // everything is now handled within the vtkGDCMImageReader as Planar Configuration can not
44 // be externalized (conflict with file lower left)
45
46 #error do not use this class
47
48 //class VTKGDCM_EXPORT vtkImagePlanarComponentsToComponents : public vtkThreadedImageAlgorithm
49 class VTKGDCM_EXPORT vtkImagePlanarComponentsToComponents : public vtkImageAlgorithm
50 {
51 public:
52     static vtkImagePlanarComponentsToComponents *New();
53     //vtkTypeMacro(vtkImagePlanarComponentsToComponents,vtkThreadedImageAlgorithm);
54     vtkTypeMacro(vtkImagePlanarComponentsToComponents,vtkImageAlgorithm);
55 }
```

```

56 void PrintSelf(ostream& os, vtkIndent indent);
57
58 protected:
59   vtkImagePlanarComponentsToComponents();
60   ~vtkImagePlanarComponentsToComponents() {};
61
62 // void ThreadedExecute (vtkImageData *inData, vtkImageData *outData,
63 //                       int ext[6], int id);
64 // virtual int RequestInformation (vtkInformation *, vtkInformationVector**, vtkInformationVector *);
65 virtual int RequestData(vtkInformation *, vtkInformationVector **, vtkInformationVector *);
66
67 private:
68   vtkImagePlanarComponentsToComponents(const vtkImagePlanarComponentsToComponents&); // Not implemented.
69   void operator=(const vtkImagePlanarComponentsToComponents&); // Not implemented.
70 };
71
72 #endif

```

## 11.631 vtkImageRGBToYBR.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkImageRGBToYBR.h:

### Classes

- class [vtkImageRGBToYBR](#)

## 11.632 vtkImageRGBToYBR.h

[Go to the documentation of this file.](#)

```

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2
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13 =====*/
14 /*=====
15
16 Portions of this file are subject to the VTK Toolkit Version 3 copyright.
17
18 Program:      Visualization Toolkit
19 Module:       $RCSfile:  vtkImageRGBToYBR.h,v $
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26 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 // .NAME vtkImageRGBToYBR - Converts YBR components to RGB.
31 // .SECTION Description
32 // For each pixel with hue, saturation and value components this filter
33 // outputs the color coded as red, green, blue. Output type must be the same

```

```

34 // as input type.
35
36 // .SECTION See Also
37 // vtkImageRGBToHSV
38
39 #ifndef VTKIMAGERGBTOYBR_H
40 #define VTKIMAGERGBTOYBR_H
41
42 #include "vtkgdcmModule.h"
43 #include "vtkThreadedImageAlgorithm.h"
44
45 class VTKGDCM_EXPORT vtkImageRGBToYBR : public vtkThreadedImageAlgorithm
46 {
47 public:
48     static vtkImageRGBToYBR *New();
49     vtkTypeMacro(vtkImageRGBToYBR,vtkThreadedImageAlgorithm);
50
51     void PrintSelf(ostream& os, vtkIndent indent);
52
53 protected:
54     vtkImageRGBToYBR();
55     ~vtkImageRGBToYBR() {};
56
57     void ThreadedExecute (vtkImageData *inData, vtkImageData *outData,
58                           int ext[6], int id);
59 private:
60     vtkImageRGBToYBR(const vtkImageRGBToYBR&); // Not implemented.
61     void operator=(const vtkImageRGBToYBR&); // Not implemented.
62 };
63
64 #endif

```

## 11.633 vtkImageYBRToRGB.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkThreadedImageAlgorithm.h"

```

Include dependency graph for vtkImageYBRToRGB.h:

### Classes

- class [vtkImageYBRToRGB](#)

## 11.634 vtkImageYBRToRGB.h

[Go to the documentation of this file.](#)

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 /*=====
15
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17
18 Program:   Visualization Toolkit
19 Module:    $RCSfile:  vtkImageYBRToRGB.h,v $

```

```

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26 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 // .NAME vtkImageYBRToRGB - Converts YBR components to RGB.
31 // .SECTION Description
32 // For each pixel with hue, saturation and value components this filter
33 // outputs the color coded as red, green, blue. Output type must be the same
34 // as input type.
35
36 // .SECTION See Also
37 // vtkImageRGBToHSV
38
39 #ifndef VTKIMAGEYBRTORGB_H
40 #define VTKIMAGEYBRTORGB_H
41
42 #include "vtkgdcmModule.h"
43 #include "vtkThreadedImageAlgorithm.h"
44
45 class VTKGDCM_EXPORT vtkImageYBRToRGB : public vtkThreadedImageAlgorithm
46 {
47 public:
48     static vtkImageYBRToRGB *New();
49     vtkTypeMacro(vtkImageYBRToRGB,vtkThreadedImageAlgorithm);
50
51     void PrintSelf(ostream& os, vtkIndent indent);
52
53 protected:
54     vtkImageYBRToRGB();
55     ~vtkImageYBRToRGB() {};
56
57     void ThreadedExecute (vtkImageData *inData, vtkImageData *outData,
58                          int ext[6], int id);
59 private:
60     vtkImageYBRToRGB(const vtkImageYBRToRGB&); // Not implemented.
61     void operator=(const vtkImageYBRToRGB&); // Not implemented.
62 };
63
64 #endif

```

## 11.635 vtkLookupTable16.h File Reference

```

#include "vtkgdcmModule.h"
#include "vtkLookupTable.h"
#include "vtkUnsignedShortArray.h"

```

Include dependency graph for vtkLookupTable16.h:

### Classes

- class [vtkLookupTable16](#)

## 11.636 vtkLookupTable16.h

[Go to the documentation of this file.](#)

```

1 /*=====
2
3 Program:  GDCM (Grassroots DICOM). A DICOM library

```

```

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11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 /*=====
15
16 Portions of this file are subject to the VTK Toolkit Version 3 copyright.
17
18 Program:      Visualization Toolkit
19 Module:      $RCSfile:  vtkLookupTable16.h,v $
20
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25 This software is distributed WITHOUT ANY WARRANTY; without even
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27 PURPOSE. See the above copyright notice for more information.
28
29 =====*/
30 // .NAME vtkLookupTable16 -
31 // .SECTION Description
32 //
33 // .SECTION Caveats
34 //
35 // .SECTION See Also
36 // vtkLookupTable
37
38 #ifndef VTKLOOKUPTABLE16_H
39 #define VTKLOOKUPTABLE16_H
40
41 #include "vtkgdcmModule.h"
42 #include "vtkLookupTable.h"
43 #include "vtkUnsignedShortArray.h"
44
45 class VTKGDCM_EXPORT vtkLookupTable16 : public vtkLookupTable
46 {
47 public:
48     static vtkLookupTable16 *New();
49
50     vtkTypeMacro(vtkLookupTable16,vtkLookupTable);
51     void PrintSelf(ostream& os, vtkIndent indent);
52
53     void Build();
54
55     void SetNumberOfTableValues(vtkIdType number);
56
57     unsigned char *WritePointer(const vtkIdType id, const int number);
58
59     unsigned short *GetPointer(const vtkIdType id) {
60         return this->Table16->GetPointer(4*id); };
61
62 protected:
63     vtkLookupTable16(int sze=256, int ext=256);
64     ~vtkLookupTable16();
65
66     vtkUnsignedShortArray *Table16;
67
68     void MapScalarsThroughTable2(void *input,
69                                 unsigned char *output,
70                                 int inputDataType,
71                                 int numberOfValues,
72                                 int inputIncrement,
73                                 int outputFormat);
74
75 private:
76     vtkLookupTable16(const vtkLookupTable16&); // Not implemented.
77     void operator=(const vtkLookupTable16&); // Not implemented.
78 };
79
80 //-----
81 inline unsigned char *vtkLookupTable16::WritePointer(const vtkIdType id,
82                                                       const int number)
83 {
84     //this->InsertTime.Modified();

```

```

85     return (unsigned char*)this->Table16->WritePointer(4*id,4*number);
86 }
87
88 #endif

```

## 11.637 vtkRTStructSetProperties.h File Reference

```
#include "vtkgdcmModule.h"
```

```
#include "vtkObject.h"
```

Include dependency graph for vtkRTStructSetProperties.h:

### Classes

- class [vtkRTStructSetProperties](#)

## 11.638 vtkRTStructSetProperties.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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9  This software is distributed WITHOUT ANY WARRANTY; without even
10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE.  See the above copyright notice for more information.
12
13 =====*/
14 // .NAME vtkRTStructSetProperties - some rtstruct properties.
15 // .SECTION Description
16 //
17 // .SECTION See Also
18 // vtkGDCMPolyDataReader vtkGDCMPolyDataWriter
19
20 #ifndef VTKRTSTRUCTSETPROPERTIES_H
21 #define VTKRTSTRUCTSETPROPERTIES_H
22
23 #include "vtkgdcmModule.h"
24 #include "vtkObject.h"
25
26 class vtkRTStructSetPropertiesInternals;
27
28 class VTKGDCM_EXPORT vtkRTStructSetProperties : public vtkObject
29 {
30 public:
31     static vtkRTStructSetProperties *New();
32     vtkTypeMacro(vtkRTStructSetProperties,vtkObject);
33     void PrintSelf(ostream& os, vtkIndent indent);
34
35     // Description:
36     // Convenience method to reset all fields to an empty string/value
37     virtual void Clear();
38
39     // Description:
40     //
41     vtkSetStringMacro(StructureSetLabel);
42     vtkGetStringMacro(StructureSetLabel);
43
44     vtkSetStringMacro(StructureSetName);
45     vtkGetStringMacro(StructureSetName);
46

```

```

47  vtkSetStringMacro (StructureSetDate);
48  vtkGetStringMacro (StructureSetDate);
49
50  vtkSetStringMacro (StructureSetTime);
51  vtkGetStringMacro (StructureSetTime);
52
53  vtkSetStringMacro (SOPInstanceUID);
54  vtkGetStringMacro (SOPInstanceUID);
55
56  vtkSetStringMacro (StudyInstanceUID);
57  vtkGetStringMacro (StudyInstanceUID);
58
59  vtkSetStringMacro (SeriesInstanceUID);
60  vtkGetStringMacro (SeriesInstanceUID);
61
62  vtkSetStringMacro (ReferenceSeriesInstanceUID);
63  vtkGetStringMacro (ReferenceSeriesInstanceUID);
64
65  vtkSetStringMacro (ReferenceFrameOfReferenceUID);
66  vtkGetStringMacro (ReferenceFrameOfReferenceUID);
67
68  // Description:
69  // Copy the contents of p to this instance.
70  virtual void DeepCopy(vtkRTStructSetProperties *p);
71
72  void AddContourReferencedFrameOfReference( vtkIdType pdnum, const char *classuid, const char *instanceuid
73  );
74  const char *GetContourReferencedFrameOfReferenceClassUID( vtkIdType pdnum, vtkIdType id );
75  const char *GetContourReferencedFrameOfReferenceInstanceUID( vtkIdType pdnum, vtkIdType id );
76  vtkIdType GetNumberOfContourReferencedFrameOfReferences();
77  vtkIdType GetNumberOfContourReferencedFrameOfReferences(vtkIdType pdnum);
78
79  void AddReferencedFrameOfReference( const char *classuid, const char *instanceuid );
80  const char *GetReferencedFrameOfReferenceClassUID( vtkIdType id );
81  const char *GetReferencedFrameOfReferenceInstanceUID( vtkIdType id );
82  vtkIdType GetNumberOfReferencedFrameOfReferences();
83
84  void AddStructureSetROI( int roinumber,
85  const char* refframerefid,
86  const char* roiname,
87  const char* ROIGenerationAlgorithm,
88  const char* ROIDescription = 0
89  );
90  void AddStructureSetROIObservation( int refnumber,
91  int observationnumber,
92  const char *rtroiinterpretedtype,
93  const char *roiinterpreter,
94  const char *roiobservationlabel = 0
95  );
96
97  vtkIdType GetNumberOfStructureSetROIs();
98  int GetStructureSetObservationNumber(vtkIdType id);
99  int GetStructureSetROIRefFrameRefUID(vtkIdType id);
100 const char *GetStructureSetROIRefFrameRefUID(vtkIdType id);
101 const char *GetStructureSetROIName(vtkIdType id);
102 const char *GetStructureSetROIGenerationAlgorithm(vtkIdType id);
103 const char *GetStructureSetROIDescription(vtkIdType id);
104 const char *GetStructureSetRTRoiInterpretedType(vtkIdType id);
105 const char *GetStructureSetROIObservationLabel(vtkIdType id);
106
107 protected:
108  vtkRTStructSetProperties();
109  ~vtkRTStructSetProperties();
110
111  char *StructureSetLabel;
112  char *StructureSetName;
113  char *StructureSetDate;
114  char *StructureSetTime;
115
116  char *SOPInstanceUID;
117  char *StudyInstanceUID;
118  char *SeriesInstanceUID;
119
120  char *ReferenceSeriesInstanceUID;
121  char *ReferenceFrameOfReferenceUID;
122
123  // Description:
124  // PIMPL Encapsulation for STL containers
125  //BTX
126  vtkRTStructSetPropertiesInternals *Internals;
127  //ETX

```

```

127
128 private:
129     vtkRTStructSetProperties(const vtkRTStructSetProperties&); // Not implemented.
130     void operator=(const vtkRTStructSetProperties&); // Not implemented.
131 };
132
133 #endif

```

## 11.639 gdcmPythonFilter.h File Reference

```

#include <Python.h>
#include "gdcmDataElement.h"
#include "gdcmDicts.h"
#include "gdcmFile.h"

```

Include dependency graph for gdcmPythonFilter.h:

### Classes

- class [gdcm::PythonFilter](#)

*PythonFilter PythonFilter* is the class that make gdcm2.x looks more like gdcm1 and transform the binary blob contained in a [DataElement](#) into a string, typically this is a nice feature to have for wrapped language.

### Namespaces

- namespace [gdcm](#)

## 11.640 gdcmPythonFilter.h

[Go to the documentation of this file.](#)

```

1  /*=====
2
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4
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8
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10 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
11 PURPOSE. See the above copyright notice for more information.
12
13 =====*/
14 #ifndef GDCMPYTHONFILTER_H
15 #define GDCMPYTHONFILTER_H
16
17 #include <Python.h>
18
19 #include "gdcmDataElement.h"
20 #include "gdcmDicts.h"
21 #include "gdcmFile.h"
22
23 namespace gdcm
24 {
25
26     class GDCM_EXPORT PythonFilter
27     {
28     public:
29         PythonFilter();

```



```
35 ~PythonFilter();
36
37 void UseDictAlways(bool ) {}
38
39 // Allow user to pass in there own dicts
40 void SetDicts(const Dicts &dicts);
41
42 // Convert to string the ByteValue contained in a DataElement
43 PyObject *ToPyObject(const Tag& t) const;
44
45 void SetFile(const File& f);
46 File &GetFile();
47 const File &GetFile() const;
48
49 private:
50     SmartPointer<File> F;
51 };
52
53 } // end namespace gdcm
54
55 #endif //GDCMPYTHONFILTER_H
```



## Chapter 12

# Example Documentation

### 12.1 TestByteSwap.cxx

This is a C++ example on how to use [gdcm::ByteSwap](#)

```
/*=====
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=====*/
#include "gdcmTypes.h"
#include "gdcmSwapCode.h"
#include "gdcmByteSwap.h"
#include <string.h> // memcpy
int myfunc()
{
    char vl_str[4];
    const char raw[] = "\000\000\000\004";
    memcpy(vl_str, raw, 4);
    uint32_t vl;
    gdcm::ByteSwap<uint32_t>::SwapRangeFromSwapCodeIntoSystem((uint32_t*)(&vl_str), gdcm::SwapCode::BigEndian, 1);
    memcpy(&vl, vl_str, 4);
    if( vl != 0x00000004 )
    {
        std::cerr << std::hex << "vl:  " << vl << std::endl;
        return 1;
    }
    gdcm::ByteSwap<uint32_t>::SwapFromSwapCodeIntoSystem(vl, gdcm::SwapCode::LittleEndian);
    if( vl != 0x00000004 )
    {
        std::cerr << std::hex << "vl:  " << vl << std::endl;
        return 1;
    }
    gdcm::ByteSwap<uint32_t>::SwapFromSwapCodeIntoSystem(vl, gdcm::SwapCode::BigEndian);
    if( vl != 0x40000000 )
    {
        std::cerr << std::hex << "vl:  " << vl << std::endl;
        return 1;
    }
    return 0;
}
int TestByteSwap(int , char *[])
{
    gdcm::SwapCode sc = gdcm::SwapCode::Unknown;
    if ( gdcm::ByteSwap<uint16_t>::SystemIsBigEndian() )
```

```

    {
        sc = gdcmm::SwapCode::BigEndian;
    }
else if ( gdcmm::ByteSwap<uint16_t>::SystemIsLittleEndian() )
    {
        sc = gdcmm::SwapCode::LittleEndian;
    }
if( sc == gdcmm::SwapCode::Unknown )
    {
        std::cerr << "unk" << std::endl;
        return 1;
    }
//std::cout << "sc: " << sc << std::endl;
uint16_t t = 0x1234;
gdcmm::ByteSwap<uint16_t>::SwapFromSwapCodeIntoSystem(t, sc);
if( sc == gdcmm::SwapCode::BigEndian )
    {
        if( t != 0x3412 )
        {
            std::cerr << std::hex << "t: " << t << std::endl;
            return 1;
        }
        // ok test pass rest value to old one
        t = 0x1234;
    }
else if ( sc == gdcmm::SwapCode::LittleEndian )
    {
        if( t != 0x1234 )
        {
            std::cerr << std::hex << "t: " << t << std::endl;
            return 1;
        }
    }
union { char n[2]; uint16_t tn; } u16;
memcpy(u16.n, &t, 2 );
gdcmm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(&u16.tn, sc, 1);
uint16_t tn = u16.tn;
if( sc == gdcmm::SwapCode::BigEndian )
    {
        if( tn != 0x3412 )
        {
            std::cerr << std::hex << "tn: " << tn << std::endl;
            return 1;
        }
        // ok test pass rest value to old one
        t = 0x1234;
    }
else if ( sc == gdcmm::SwapCode::LittleEndian )
    {
        if( tn != 0x1234 )
        {
            std::cerr << std::hex << "tn: " << tn << std::endl;
            return 1;
        }
    }
gdcmm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(&u16.tn, gdcmm::SwapCode::BigEndian, 1);
tn = u16.tn;
if( sc == gdcmm::SwapCode::LittleEndian )
    {
        if( tn != 0x3412 )
        {
            std::cerr << std::hex << "tn: " << tn << std::endl;
            return 1;
        }
    }
else if ( sc == gdcmm::SwapCode::BigEndian )
    {
        if( tn != 0x1234 )
        {
            std::cerr << std::hex << "tn: " << tn << std::endl;
            return 1;
        }
    }
}
if( myfunc() )
    {
        return 1;
    }
uint16_t array[] = { 0x1234 };
gdcmm::ByteSwap<uint16_t>::SwapRangeFromSwapCodeIntoSystem(array,
    gdcmm::SwapCode::BigEndian,1);
if ( array[0] != 0x3412 )

```

```

    {
        std::cerr << std::hex << "array:  " << array[0] << std::endl;
        return 1;
    }
    return 0;
}

```

## 12.2 PatchFile.cpp

This is a C++ example on how to use [gdcm::Attribute](#)

```

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=====*/
/*
 * The image was a broken file where the Pixel Data element was 8 times too big
 * Apparently multiplying the BitsAllocated to 4 and multiplying the number of
 * frames by 2 would solve the problem
 *
 * This C++ code can be used to patch the header.
 */
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmWriter.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char *f = argv[1];
    const char *out = argv[2];
    gdcm::Reader r;
    r.SetFileName( f );
    if( !r.Read() )
    {
        return 1;
    }
    gdcm::File &file = r.GetFile();
    gdcm::DataSet& ds = file.GetDataSet();
    // (0028,0100) US 16          # 2, 1 BitsAllocated
    // (0028,0101) US 16          # 2, 1 BitsStored
    // (0028,0102) US 15          # 2, 1 HighBit
    //
    {
        gdcm::Attribute<0x28,0x100> at;
        at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
        if( at.GetValue() != 8 )
        {
            return 1;
        }
        at.SetValue( 32 );
        ds.Replace( at.GetAsDataElement() );
    }
    {
        gdcm::Attribute<0x28,0x101> at;
        at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
        if( at.GetValue() != 8 )
        {
            return 1;
        }
        at.SetValue( 32 );
        ds.Replace( at.GetAsDataElement() );
    }
}

```

```

{
    gdcmm::Attribute<0x28,0x102> at;
    at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
    if( at.GetValue() != 7 )
    {
        return 1;
    }
    at.SetValue( 31 );
    ds.Replace( at.GetAsDataElement() );
}
// (0028,0008) IS [56] # 2, 1 NumberOfFrames
{
    gdcmm::Attribute<0x28,0x8> at;
    at.SetFromDataElement( ds.GetDataElement( at.GetTag() ) );
    at.SetValue( at.GetValue() * 2 );
    ds.Replace( at.GetAsDataElement() );
}
gdcmm::Writer w;
w.SetFile( file );
w.SetCheckFileMetaInformation( false );
w.SetFileName( out );
if( !w.Write() )
{
    return 1;
}
// Now let's see if we can read it as an image:
gdcmm::ImageReader ir;
ir.SetFileName( out );
if( !ir.Read() )
{
    return 1;
}
gdcmm::Image &image = ir.GetImage();
unsigned long len = image.GetBufferLength();
const gdcmm::ByteValue *bv = ir.GetFile().GetDataSet().GetDataElement( gdcmm::Tag(0x7fe0,0x0010)
    ).GetByteValue();
if( !bv || len != bv->GetLength() )
{
    return 1;
}
std::cout << bv->GetLength() << " " << len << std::endl;
std::cout << "Success to rewrite image !" << std::endl;
image.Print( std::cout );
return 0;
}

```

## 12.3 SimplePrint.cs

This is a C# example on how to use gdcmm::SWIGDataSet

```

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=====*/
/*
Converter convertor = new Converter();
int a = convertor.Convert<int>( some_int_blob );
double b = convertor.Convert<double>( some_double_blob );
*/
/*
* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcmm/debug-gcc/bin
* $ mono bin/SimplePrint.exe gdcmmData/012345.002.050.dcm
*/
using System;
using gdcmm;
public class SimplePrint

```

```

{
    public static void RecurseDataSet(File f, DataSet ds, string indent)
    {
        CSharpDataSet cds = new CSharpDataSet(ds);
        while(!cds.IsAtEnd())
        {
            DataElement de = cds.GetCurrent();
            // Compute VR from the toplevel file, and the currently processed dataset:
            VR vr = DataSetHelper.ComputeVR(f, ds, de.GetTag() );
            if( vr.Compatible( new VR(VR.VRType.SQ) ) )
            {
                uint uvl = (uint)de.GetVL(); // Test cast is ok
                System.Console.WriteLine( indent + de.GetTag().toString() + ":" + uvl ); // why not ?
                //SequenceOfItems sq = de.GetSequenceOfItems();
                // GetValueAsSQ handle more cases than GetSequenceOfItems
                SmartPtrSQ sq = de.GetValueAsSQ();
                uint n = sq.GetNumberOfItems();
                for( uint i = 1; i <= n; i++) // item starts at 1, not 0
                {
                    Item item = sq.GetItem( i );
                    DataSet nested = item.GetNestedDataSet();
                    RecurseDataSet( f, nested, indent + "  " );
                }
            }
            else
            {
                System.Console.WriteLine( indent + de.toString() );
            }
            cds.Next();
        }
    }

    public static int Main(string[] args)
    {
        string filename = args[0];
        Reader reader = new Reader();
        reader.SetFileName( filename );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();
        RecurseDataSet( f, ds, "" );
        return 0;
    }
}

```

## 12.4 TestReader.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmFileMetaInformation.h"
#include "gdcmFile.h"
#include "gdcmTesting.h"
#include "gdcmMediaStorage.h"
int TestRead(const char* filename, bool verbose = false)
{
    if( verbose )
        std::cout << "TestRead:  " << filename << std::endl;
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if ( !reader.Read() )
    {
        std::cerr << "TestReadError:  Failed to read:  " << filename << std::endl;
    }
}

```

```

        return 1;
    }
}
//commenting out the fmi and ds to avoid warnings
//const gdcm::FileMetaInformation &h = reader.GetFile().GetHeader();
//std::cout << h << std::endl;
//const gdcm::DataSet &ds = reader.GetFile().GetDataSet();
//std::cout << ds << std::endl;
const char *ref = gdcm::Testing::GetMediaStorageFromFile(filename);
gdcm::MediaStorage ms;
ms.SetFromFile( reader.GetFile() );
if( !ref )
{
    std::cerr << "TestReadError: Missing MediaStorage: " << filename << std::endl;
    std::cerr << "It should be: " << ms << std::endl;
    return 1;
}
if( ms.IsUndefined() && ref && *ref != 0 )
{
    std::cerr << "TestReadError: MediaStorage: " << filename << std::endl;
    std::cerr << "It should be instead: " << ref << std::endl;
    return 1;
}
// Make sure it is the right one:
if( ref && *ref != 0 && ms != gdcm::MediaStorage::GetMSType(ref) )
{
    std::cerr << "Error: Found MediaStorage: " << ms << " for " << filename << std::endl;
    std::cerr << "It should be instead: " << ref << std::endl;
    return 1;
}
return 0;
}

int TestReader(int argc, char *argv[])
{
    if( argc == 2 )
    {
        const char *filename = argv[1];
        return TestRead(filename, true);
    }
    // else
    gdcm::Trace::DebugOff();
    gdcm::Trace::WarningOff();
    int r = 0, i = 0;
    const char *filename;
    const char * const *filenames = gdcm::Testing::GetFileNames();
    while( (filename = filenames[i]) )
    {
        r += TestRead( filename );
        ++i;
    }
    return r;
}

```

## 12.5 TestReader.py

This is a C++ example on how to use [gdcm::Reader](#)

```

1
14
15 import os,sys
16 import gdcm
17
18 def TestRead(filename, verbose = False):
19     r = gdcm.Reader()
20     r.SetFileName( filename )
21     success = r.Read()
22     #if verbose: print r.GetFile()
23     if verbose: print(r.GetFile().GetDataSet())
24     return success
25
26 if __name__ == "__main__":
27     success = 0
28     try:
29         filename = os.sys.argv[1]
30         success += TestRead( filename, True )
31     except:
32         # loop over all files:

```



```

33     gdcmm.Trace.DebugOff()
34     gdcmm.Trace.WarningOff()
35     t = gdcmm.Testing()
36     nfiles = t.GetNumberOfFileNames()
37     for i in range(0,nfiles):
38         filename = t.GetFileName(i)
39         success += TestRead( filename )
40
41
42     # Test succeed ?
43     sys.exit(success == 0)

```

## 12.6 DecompressJPEGFile.cs

This is a C# example on how to use `gdcmm::SequenceOfFragments`

```
/*=====
```

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```
=====*/
```

```

/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcmm/debug-gcc/bin
 * $ mono bin/DecompressJPEGFile.exe somejpegfile.jpg
 */
using System;
using gdcmm;
public class DecompressJPEGFile
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        System.IO.FileStream infile =
            new System.IO.FileStream(file1, System.IO.FileMode.Open, System.IO.FileAccess.Read);
        uint fsize = gdcmm.PosixEmulation.FileSize(file1);
        byte[] jstream = new byte[fsize];
        infile.Read(jstream, 0, jstream.Length);
        Trace.DebugOn();
        Image image = new Image();
        image.SetNumberOfDimensions( 2 ); // important for now
        DataElement pixeldata = new DataElement( new gdcmm.Tag(0x7fe0,0x0010) );
        // DO NOT set a ByteValue here, JPEG is a particular kind of encapsulated syntax
        // in which can one cannot use a simple byte array for storage. Instead, see
        // gdcmm.SequenceOfFragments
        //pixeldata.SetByteValue( jstream, new gdcmm.VL( (uint)jstream.Length ) );
        // Create a new SequenceOfFragments C++ object, store it as a SmartPointer :
        SmartPtrFrag sq = SequenceOfFragments.New();
        Fragment frag = new Fragment();
        frag.SetByteValue( jstream, new gdcmm.VL( (uint)jstream.Length ) );
        // Single file => single fragment
        sq.AddFragment( frag );
        // Pass by reference:
        pixeldata.SetValue( sq.__ref__() );
        // insert:
        image.SetDataElement( pixeldata );
        // JPEG use YBR to achieve better compression ratio by default (not RGB)
        // FIXME hardcoded:
        PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.YBR_FULL );
        image.SetPhotometricInterpretation( pi );
        // FIXME hardcoded:
        PixelFormat pixeltype = new PixelFormat(3,8,8,7);
        image.SetPixelFormat( pixeltype );
        // FIXME hardcoded:
        image.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 ) );
        image.SetDimension(0, 692);
        image.SetDimension(1, 721);
        // Decompress !
    }
}

```

```

byte[] decompressedData = new byte[(int)image.GetBufferLength()];
image.GetBuffer(decompressedData);
// Write out the decompressed bytes
System.Console.WriteLine(image.ToString());
using (System.IO.Stream stream =
    System.IO.File.Open(@"tmp/dd.raw",
        System.IO.FileMode.Create))
{
    System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
    writer.Write(decompressedData);
}
return 0;
}
}

```

## 12.7 ManipulateFile.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ManipulateFile.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;
public class ManipulateFile
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        string file2 = args[1];
        Reader reader = new Reader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        Anonymizer ano = new Anonymizer();
        ano.SetFile( reader.GetFile() );
        ano.RemovePrivateTags();
        ano.RemoveGroupLength();
        Tag t = new Tag(0x10,0x10);
        ano.Replace( t, "GDCM^Csharp^Test^Hello^World" );
        UIDGenerator g = new UIDGenerator();
        ano.Replace( new Tag(0x0008,0x0018), g.Generate() );
        ano.Replace( new Tag(0x0020,0x000d), g.Generate() );
        ano.Replace( new Tag(0x0020,0x000e), g.Generate() );
        ano.Replace( new Tag(0x0020,0x0052), g.Generate() );
        Writer writer = new Writer();
        writer.SetFileName( file2 );
        writer.SetFile( ano.GetFile() );
        ret = writer.Write();
        if( !ret )
        {
            return 1;
        }
        return 0;
    }
}

```

## 12.8 ClinicalTrialIdentificationWorkflow.cs

This is a C# example on how to use Anonymizer

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * Typical usage on UNIX:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ClinicalTrialIdentificationWorkflow.exe input_dir output_dir
 */
using System;
using gdcm;
public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void StartFilter() {
        System.Console.WriteLine( "This is my start" );
    }
    protected override void EndFilter(){
        System.Console.WriteLine( "This is my end" );
    }
    protected override void ShowProgress(Subject caller, Event evt){
        ProgressEvent pe = ProgressEvent.Cast(evt);
        System.Console.WriteLine( "This is my progress:  " + pe.GetProgress() );
    }
    protected override void ShowIteration(){
        System.Console.WriteLine( "This is my iteration" );
    }
    protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 * http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 * System.Console.WriteLine( "This is my Anonymization.  Type:  " + evt.GetEventName() );
 * System.Type type = evt.GetType();
 * System.Console.WriteLine( "This is my Anonymization.  System.Type:  " + type.ToString() );
 * System.Console.WriteLine( "This is my Anonymization.  CheckEvent:  " + ae.CheckEvent( evt ) );
 * System.Console.WriteLine( "This is my Anonymization.  Processing Tag #" + ae.GetTag().toString() );
 */
        AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
        if( ae != null )
        {
            Tag t = ae.GetTag();
            System.Console.WriteLine( "This is my Anonymization.  Processing Tag #" + t.toString() );
        }
        else
        {
            System.Console.WriteLine( "This is my Anonymization.  Unhandled Event type:  " + evt.GetEventName() );
        }
    }
    protected override void ShowAbort(){
        System.Console.WriteLine( "This is my abort" );
    }
}

public class ClinicalTrialIdentificationWorkflow
{
    public static bool ProcessOneFile( gdcm.Anonymizer ano , string filename, string outfilename )
    {
        Reader reader = new Reader();
        reader.SetFileName( filename );
        bool ret = reader.Read();
        if( !ret )
        {
            return false;
        }
        // Pass in the file:
        ano.SetFile( reader.GetFile() );
        // First step, let's protect all Patient information as per

```

```

// PS 3.15 / E.1 / Basic Application Level Confidentiality Profile
if( !ano.BasicApplicationLevelConfidentialityProfile() )
{
    return false;
}
// Now let's pass in all Clinical Trial fields
// PS 3.3 - 2008 / C.7.1.3 Clinical Trial Subject Module
/*
Clinical Trial Sponsor Name (0012,0010) 1 The name of the clinical trial sponsor. See C.7.1.3.1.1.
Clinical Trial Protocol ID (0012,0020) 1 Identifier for the noted protocol. See C.7.1.3.1.2.
Clinical Trial Protocol Name (0012,0021) 2 The name of the clinical trial protocol. See C.7.1.3.1.3.
Clinical Trial Site ID (0012,0030) 2 The identifier of the site responsible for submitting clinical trial data.
    See C.7.1.3.1.4.
Clinical Trial Site Name (0012,0031) 2 Name of the site responsible for submitting clinical trial data. See
    C.7.1.3.1.5
Clinical Trial Subject ID (0012,0040) 1C The assigned identifier for the clinical trial subject. See
    C.7.1.3.1.6. Shall be present if Clinical Trial Subject Reading ID (0012,0042) is absent. May be present
    otherwise.
Clinical Trial Subject Reading ID (0012,0042) 1C Identifies the subject for blinded evaluations. Shall be
    present if Clinical Trial Subject ID (0012,0040) is absent. May be present otherwise. See C.7.1.3.1.7.
*/
ano.Replace( new gdcm.Tag(0x0012,0x0010), "MySponsorName");
ano.Replace( new gdcm.Tag(0x0012,0x0020), "MyProtocolID");
ano.Replace( new gdcm.Tag(0x0012,0x0021), "MyProtocolName");
ano.Replace( new gdcm.Tag(0x0012,0x0030), "MySiteId");
ano.Replace( new gdcm.Tag(0x0012,0x0031), "MySiteName");
ano.Replace( new gdcm.Tag(0x0012,0x0040), "MySponsorId");
ano.Replace( new gdcm.Tag(0x0012,0x0050), "MyTPId");
ano.Replace( new gdcm.Tag(0x0012,0x0051), "MyTPDescription");
// The following two are not required as they are guaranteed to be filled in by the
// Basic Application Level Confidentiality Profile. Only override if you understand what
// you are doing
//ano.Replace( new gdcm.Tag(0x0012,0x0062), "YES");
//ano.Replace( new gdcm.Tag(0x0012,0x0063), "My Super Duper Anonymization Overload");
// We might be generating a subdirectory. Let's make sure the subdir exist:
gdcm.Filename fn = new gdcm.Filename( outfilename );
string subdir = fn.GetPath();
if( !gdcm.PosixEmulation.MakeDirectory( subdir ) )
{
    return false;
}
gdcm.FileMetaInformation fmi = ano.GetFile().GetHeader();
// The following three lines make sure to regenerate any value:
fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
fmi.Remove( new gdcm.Tag(0x0002,0x0016) );
Writer writer = new Writer();
writer.SetFileName( outfilename );
writer.SetFile( ano.GetFile() );
ret = writer.Write();
if( !ret )
{
    return false;
}
return true;
}
public static int Main(string[] args)
{
    gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My ClinicalTrial App" );
    // http://www.oid-info.com/get/1.3.6.1.4.17434
    string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
    gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
    System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );
    gdcm.Global global = gdcm.Global.GetInstance();
    if( !global.LoadResourcesFiles() )
    {
        System.Console.WriteLine( "Could not LoadResourcesFiles" );
        return 1;
    }
    if( args.Length != 2 )
    {
        System.Console.WriteLine( "Usage:" );
        System.Console.WriteLine( "ClinicalTrialIdentificationWorkflow input_dir output_dir" );
        return 1;
    }
    string dir1 = args[0];
    string dir2 = args[1];
    // Check input is valid:
    if( !gdcm.PosixEmulation.FileIsDirectory(dir1) )
    {
        System.Console.WriteLine( "Input directory: " + dir1 + " does not exist. Sorry" );
    }
}

```

```

        return 1;
    }
    if( !gdcm.PosixEmulation.FileIsDirectory(dir2) )
    {
        System.Console.WriteLine( "Output directory: " + dir2 + " does not exist. Sorry" );
        return 1;
    }
    // Recursively search all file within this toplevel directory:
    Directory d = new Directory();
    uint nfiles = d.Load( dir1, true );
    if(nfiles == 0) return 1;
    // Let's use the pre-shipped certificate of GDCM.
    string certpath = gdcm.Filename.Join(gdcm.Testing.GetSourceDirectory(),
        "/Testing/Source/Data/certificate.pem" );
    gdcm.CryptoFactory fact = gdcm.CryptoFactory.GetFactoryInstance();
    gdcm.CryptographicMessageSyntax cms = fact.CreateCMSProvider();
    if( !cms.ParseCertificateFile( certpath ) )
    {
        System.Console.WriteLine( "PEM Certificate : " + certpath + " could not be read. Sorry" );
        return 1;
    }
    //Anonymizer ano = new Anonymizer();
    // A reference to an actual C++ instance is required here:
    SmartPtrAno sano = Anonymizer.New();
    Anonymizer ano = sano.__ref__();
    //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(ano, "Anonymizer");
    MyWatcher watcher = new MyWatcher(ano);
    // Explicitly specify the Cryptographic Message Syntax to use:
    ano.SetCryptographicMessageSyntax( cms );
    // Process all filenames:
    FilenamesType filenames = d.GetFilenames();
    for( uint i = 0; i < nfiles; ++i )
    {
        string filename = filenames[ (int)i ];
        string outfilename = filename.Replace( dir1, dir2 );
        System.Console.WriteLine( "Filename: " + filename );
        System.Console.WriteLine( "Out Filename: " + outfilename );
        if( !ProcessOneFile( ano , filename, outfilename ) )
        {
            System.Console.WriteLine( "Could not process filename: " + filename );
            return 1;
        }
    }
    return 0;
}
}

```

## 12.9 GenerateDICOMDIR.cs

This is a C# example on how to use DICOMDIRGenerator

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * Simple C# example to show how to use DICOMDIRGenerator
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/GenerateDICOMDIR.exe path output_filename
 */
using System;
using gdcm;
public class GenerateDICOMDIR
{
    public static int Main(string[] args)

```

```

{
    string directory = args[0];
    string outfilename = args[1];
    Directory d = new Directory();
    uint nfiles = d.Load( directory, true );
    if(nfiles == 0) return 1;
    //System.Console.WriteLine( "Files:\n" + d.toString() );
    // Implement fast path ?
    // Scanner s = new Scanner();
    string descriptor = "My_Descriptor";
    FilenamesType filenames = d.GetFilesNames();
    gdcm.DICOMDIRGenerator gen = new DICOMDIRGenerator();
    gen.SetFilenames( filenames );
    gen.SetDescriptor( descriptor );
    if( !gen.Generate() )
    {
        return 1;
    }
    gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "GenerateDICOMDIR" );
    gdcm.Writer writer = new Writer();
    writer.SetFile( gen.GetFile() );
    writer.SetFileName( outfilename );
    if( !writer.Write() )
    {
        return 1;
    }
    return 0;
}
}

```

## 12.10 GenFakelImage.cxx

/\*=====

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```

=====*/
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmFileDerivation.h"
#include "gdcmUIDGenerator.h"
// #include "gdcmImageChangePhotometricInterpretation.h"
/*
 * This example shows two things:
 * 1. How to create an image ex-nihilo
 * 2. How to use the gdcm.FileDerivation filter. This filter is meant to create "DERIVED" image
 * object. FileDerivation has a simple API where you can reference *all* the input image that have been
 * used to generate the image. The API also allows user to specify the purpose of reference (see CID 7202,
 * PS 3.16 - 2008), and the image derivation type (CID 7203, PS 3.16 - 2008).
 */
int main(int, char *[])
{
    // Step 1: Fake Image
    gdcm::SmartPointer<gdcm::Image> im = new gdcm::Image;
    char * buffer = new char[ 256 * 256 * 3];
    char * p = buffer;
    int b = 128;
    //int ybr[3];
    int ybr2[3];
    //int rgb[3];
    for(int r = 0; r < 256; ++r)
        for(int g = 0; g < 256; ++g)
            //for(int b = 0; b < 256; ++b)
            {
                //rgb[0] = r;
                //rgb[1] = g;
                //rgb[1] = 128;
                //rgb[2] = b;
                //ybr[0] = r;
            }
}

```

```

        //ybr[1] = g;
        //ybr[1] = 128;
        //ybr[2] = b;
        ybr2[0] = r;
        ybr2[1] = g;
        ybr2[1] = 128;
        ybr2[2] = b;
        //gdcmm::ImageChangePhotometricInterpretation::YBR2RGB(rgb, ybr);
        //gdcmm::ImageChangePhotometricInterpretation::RGB2YBR(ybr2, rgb);
        *p++ = (char)ybr2[0];
        *p++ = (char)ybr2[1];
        *p++ = (char)ybr2[2];
    }
    im->SetNumberOfDimensions( 2 );
    im->SetDimension(0, 256 );
    im->SetDimension(1, 256 );
    im->GetPixelFormat().SetSamplesPerPixel(3);
    //im->SetPhotometricInterpretation( gdcmm::PhotometricInterpretation::RGB );
    im->SetPhotometricInterpretation( gdcmm::PhotometricInterpretation::YBR_FULL );
    unsigned long l = im->GetBufferLength();
    if( l != 256 * 256 * 3 )
    {
        return 1;
    }
    gdcmm::DataElement pixeldata( gdcmm::Tag(0x7fe0,0x0010) );
    pixeldata.SetByteValue( buffer, (uint32_t)l );
    delete[] buffer;
    im->SetDataElement( pixeldata );
    gdcmm::UIDGenerator uid; // helper for uid generation
    gdcmm::SmartPointer<gdcmm::File> file = new gdcmm::File; // empty file
    // Step 2: DERIVED object
    gdcmm::FileDerivation fd;
    // For the pupose of this exercise we will pretend that this image is referencing
    // two source image (we need to generate fake UID for that).
    const char ReferencedSOPClassUID[] = "1.2.840.10008.5.1.4.1.1.7"; // Secondary Capture
    fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
    fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
    // Again for the purpose of the exercise we will pretend that the image is a
    // multiplanar reformat (MPR):
    // CID 7202 Source Image Purposes of Reference
    // { "DCM",121322,"Source image for image processing operation"},
    fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121322 );
    // CID 7203 Image Derivation
    // { "DCM",113072,"Multiplanar reformatting" },
    fd.SetDerivationCodeSequenceCodeValue( 113072 );
    fd.SetFile( *file );
    // If all Code Value are ok the filter will execute properly
    if( !fd.Derive() )
    {
        std::cerr << "Sorry could not derive using input info" << std::endl;
        return 1;
    }
    // We pass both :
    // 1. the fake generated image
    // 2. the 'DERIVED' dataset object
    // to the writer.
    gdcmm::ImageWriter w;
    w.SetImage( *im );
    w.SetFile( fd.GetFile() );
    // Set the filename:
    w.SetFileName( "ybr2.dcm" );
    if( !w.Write() )
    {
        return 1;
    }
    return 0;
}

```

## 12.11 ReformatFile.cs

This is a C++ example on how to use FileDerivation

/\*=====

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 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR  
 PURPOSE. See the above copyright notice for more information.

```

=====*/
/*
 * Simple C# example
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/ReformatFile.exe input.dcm output.dcm
 */
using System;
using gdcm;
public class ReformatFile
{
    public static int Main(string[] args)
    {
        gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My Reformat App" );
        // http://www.oid-info.com/get/1.3.6.1.4.17434
        string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
        gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
        System.Console.WriteLine( "Root dir is now: " + gdcm.UIDGenerator.GetRoot() );
        string filename = args[0];
        string outfilename = args[1];
        Reader reader = new Reader();
        reader.SetFileName( filename );
        if( !reader.Read() )
        {
            System.Console.WriteLine( "Could not read: " + filename );
            return 1;
        }
        UIDGenerator uid = new UIDGenerator(); // helper for uid generation
        FileDerivation fd = new FileDerivation();
        // For the pupose of this exercise we will pretend that this image is referencing
        // two source image (we need to generate fake UID for that).
        string ReferencedSOPClassUID = "1.2.840.10008.5.1.4.1.1.7"; // Secondary Capture
        fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
        fd.AddReference( ReferencedSOPClassUID, uid.Generate() );
        // Again for the purpose of the exercise we will pretend that the image is a
        // multiplanar reformat (MPR):
        // CID 7202 Source Image Purposes of Reference
        // { "DCM",121322,"Source image for image processing operation"},
        fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121322 );
        // CID 7203 Image Derivation
        // { "DCM",113072,"Multiplanar reformatting" },
        fd.SetDerivationCodeSequenceCodeValue( 113072 );
        fd.SetFile( reader.GetFile() );
        // If all Code Value are ok the filter will execute properly
        if( !fd.Derive() )
        {
            return 1;
        }
        gdcm.FileMetaInformation fmi = reader.GetFile().GetHeader();
        // The following three lines make sure to regenerate any value:
        fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
        fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
        fmi.Remove( new gdcm.Tag(0x0002,0x0016) );
        Writer writer = new Writer();
        writer.SetFileName( outfilename );
        writer.SetFile( fd.GetFile() );
        if( !writer.Write() )
        {
            System.Console.WriteLine( "Could not write: " + outfilename );
            return 1;
        }
        return 0;
    }
}

```

## 12.12 DecompressImage.cs

This is a C# example on how to use Image



```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/DecompressImage.exe gdcmData/012345.002.050.dcm decompress.dcm
 */
using System;
using gdcm;
public class DecompressImage
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        string file2 = args[1];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        // check that one can access a Fragment from C#:
        var de = reader.GetFile().GetDataSet().GetDataElement(new Tag(0x7fe0, 0x0010));
        var sq = de.GetSequenceOfFragments();
        sq.GetFragment(0);
        Image image = new Image();
        Image ir = reader.GetImage();
        image.SetNumberOfDimensions( ir.GetNumberOfDimensions() );
        //Just for fun:
        //int dircos = ir.GetDirectionCosines();
        //t = gdcm.Orientation.GetType(dircos);
        //int l = gdcm.Orientation.GetLabel(t);
        //System.Console.WriteLine( "Orientation label:" + l );
        // Set the dimensions,
        // 1. either one at a time
        //image.SetDimension(0, ir.GetDimension(0) );
        //image.SetDimension(1, ir.GetDimension(1) );
        // 2. the array at once
        uint[] dims = {0, 0};
        // Just for fun let's invert the dimensions:
        dims[0] = ir.GetDimension(1);
        dims[1] = ir.GetDimension(0);
        ir.SetDimensions( dims );
        PixelFormat pixeltype = ir.GetPixelFormat();
        image.SetPixelFormat( pixeltype );
        PhotometricInterpretation pi = ir.GetPhotometricInterpretation();
        image.SetPhotometricInterpretation( pi );
        DataElement pixeldata = new DataElement( new Tag(0x7fe0,0x0010) );
        byte[] str1 = new byte[ ir.GetBufferLength()];
        ir.GetBuffer( str1 );
        //System.Console.WriteLine( ir.GetBufferLength() );
        pixeldata.SetByteValue( str1, new VL( (uint)str1.Length ) );
        //image.SetDataElement( pixeldata );
        ir.SetDataElement( pixeldata );
        ImageWriter writer = new ImageWriter();
        writer.SetFileName( file2 );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( ir );
        ret = writer.Write();
        if( !ret )
        {
            return 1;
        }
        return 0;
    }
}

```

## 12.13 StandardizeFiles.cs

This is a C++ example on how to use ImageChangeTransferSyntax

```

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * Simple C# example to show how one would 'Standardize' a DICOM File-Set
 *
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/StandardizeFiles.exe input_path output_path
 */
using System;
using gdcm;
public class StandardizeFiles
{
    public static bool ProcessOneFile( string filename, string outfilename )
    {
        PixmapReader reader = new PixmapReader();
        reader.SetFileName( filename );
        if( !reader.Read() )
        {
            System.Console.WriteLine( "Could not read:  " + filename );
            return false;
        }
        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetForce( false ); // do we really want to recompress when input is already compressed in same alg ?
        change.SetCompressIconImage( false ); // Keep it simple
        change.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEG2000Lossless ) );
        change.SetInput( reader.GetPixmap() );
        if( !change.Change() )
        {
            System.Console.WriteLine( "Could not change:  " + filename );
            return false;
        }
        gdcm.FileMetaInformation fmi = reader.GetFile().GetHeader();
        // The following three lines make sure to regenerate any value:
        fmi.Remove( new gdcm.Tag(0x0002,0x0012) );
        fmi.Remove( new gdcm.Tag(0x0002,0x0013) );
        fmi.Remove( new gdcm.Tag(0x0002,0x0016) );
        PixmapWriter writer = new PixmapWriter();
        writer.SetFileName( outfilename );
        writer.SetFile( reader.GetFile() );
        gdcm.Pixmap pixout = ((PixmapToPixmapFilter)change).GetOutput();
        writer.SetPixmap( pixout );
        if( !writer.Write() )
        {
            System.Console.WriteLine( "Could not write:  " + outfilename );
            return false;
        }
        return true;
    }
    public static int Main(string[] args)
    {
        gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "My Standardize App" );
        // http://www.oid-info.com/get/1.3.6.1.4.17434
        string THERALYS_ORG_ROOT = "1.3.6.1.4.17434";
        gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT );
        System.Console.WriteLine( "Root dir is now:  " + gdcm.UIDGenerator.GetRoot() );
        string dir1 = args[0];
        string dir2 = args[1];
        // Check input is valid:
        if( !gdcm.PosixEmulation.FileIsDirectory(dir1) )
        {
            System.Console.WriteLine( "Input directory:  " + dir1 + " does not exist. Sorry" );
            return 1;
        }
        if( !gdcm.PosixEmulation.FileIsDirectory(dir2) )

```

```

    {
        System.Console.WriteLine( "Output directory: " + dir2 + " does not exist. Sorry" );
        return 1;
    }
    Directory d = new Directory();
    uint nfiles = d.Load( dir1, true );
    if(nfiles == 0) return 1;
    // Process all filenames:
    FilenamesType filenames = d.GetFilesNames();
    for( uint i = 0; i < nfiles; ++i )
    {
        string filename = filenames[ (int)i ];
        string outfilename = filename.Replace( dir1, dir2 );
        System.Console.WriteLine( "Filename: " + filename );
        System.Console.WriteLine( "Out Filename: " + outfilename );
        if( !ProcessOneFile( filename, outfilename ) )
        {
            System.Console.WriteLine( "Could not process filename: " + filename );
            //return 1;
        }
    }
    return 0;
}
}

```

## 12.14 ScanDirectory.cs

This is a C# example on how to use Scanner

/\*=====

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=====\*/

```

/*
 * Usage:
 * $ bin/ScanDirectory.exe /path/to/gdcmData/
 */
using System;
using gdcm;
// We will print each filename being processed
public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void ShowFileName(Subject caller, Event evt){
        FileNameEvent fne = FileNameEvent.Cast(evt);
        if( fne != null )
        {
            string fn = fne.GetFileName();
            System.Console.WriteLine( "This is my Scanner. Processing FileName: " + fn );
        }
        else
        {
            System.Console.WriteLine( "This is my Anonymization. Unhandled Event type: " + evt.GetEventName() );
        }
    }
}
}
public class ScanDirectory
{
    public static int Main(string[] args)
    {
        string directory = args[0];
        Tag t = new Tag(0x8,0x80);
        Directory d = new Directory();
        uint nfiles = d.Load( directory );
        if(nfiles == 0) return 1;
        //System.Console.WriteLine( "Files:\n" + d.toString() );
        // Use a StrictScanner, need to use a reference to pass the C++ pointer to
    }
}

```

```

// MyWatcher implementation
SmartPtrStrictScan sscan = StrictScanner.New();
StrictScanner s = sscan.__ref__();
MyWatcher watcher = new MyWatcher(s);
s.AddTag( t );
bool b = s.Scan( d.GetFileNames() );
if(!b) return 1;
for(int i = 0; i < (int)nfiles; ++i)
{
    if( !s.IsKey( d.GetFileNames()[i] ) )
    {
        System.Console.WriteLine( "File is not DICOM or could not be read: " + d.GetFileNames()[i] );
    }
}
System.Console.WriteLine( "Scan:\n" + s.toString() );
System.Console.WriteLine( "success" );
return 0;
}
}

```

## 12.15 BasicAnonymizer.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/BasicAnonymizer.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;
public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
        protected override void StartFilter() {
            System.Console.WriteLine( "This is my start" );
        }
        protected override void EndFilter(){
            System.Console.WriteLine( "This is my end" );
        }
        protected override void ShowProgress(Subject caller, Event evt){
            ProgressEvent pe = ProgressEvent.Cast(evt);
            System.Console.WriteLine( "This is my progress: " + pe.GetProgress() );
        }
        protected override void ShowIteration(){
            System.Console.WriteLine( "This is my iteration" );
        }
        protected override void ShowAnonymization(Subject caller, Event evt){
/*
 * A couple of explanation are necessary here to understand how SWIG work
 * http://www.swig.org/Doc1.3/Java.html#adding_downcasts
 *
 * System.Console.WriteLine( "This is my Anonymization.  Type: " + evt.GetEventName() );
 * System.Type type = evt.GetType();
 * System.Console.WriteLine( "This is my Anonymization.  System.Type: " + type.ToString() );
 * System.Console.WriteLine( "This is my Anonymization.  CheckEvent: " + ae.CheckEvent( evt ) );
 * System.Console.WriteLine( "This is my Anonymization.  Processing Tag #" + ae.GetTag().toString() );
 */
            AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
            if( ae != null )
            {
                Tag t = ae.GetTag();
                System.Console.WriteLine( "This is my Anonymization.  Processing Tag #" + t.toString() );
            }
            else
            {

```

```

        System.Console.WriteLine( "This is my Anonymization.  Unhandled Event type:  " + evt.GetEventName() );
    }
}
protected override void ShowAbort(){
    System.Console.WriteLine( "This is my abort" );
}
}
public class BasicAnonymizer
{
    public static int Main(string[] args)
    {
        gdcm.Global global = gdcm.Global.GetInstance();
        if( !global.LoadResourcesFiles() )
        {
            System.Console.WriteLine( "Could not LoadResourcesFiles" );
            return 1;
        }
        string file1 = args[0];
        string file2 = args[1];
        Reader reader = new Reader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        string certpath = gdcm.Filename.Join(gdcm.Testing.GetSourceDirectory(),
            "/Testing/Source/Data/certificate.pem" );
        gdcm.CryptoFactory fact = gdcm.CryptoFactory.GetFactoryInstance();
        gdcm.CryptographicMessageSyntax cms = fact.CreateCMSProvider();
        if( !cms.ParseCertificateFile( certpath ) )
        {
            return 1;
        }
        //Anonymizer ano = new Anonymizer();
        SmartPtrAno sano = Anonymizer.New();
        Anonymizer ano = sano.__ref__();
        //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(ano, "Anonymizer");
        MyWatcher watcher = new MyWatcher(ano);
        ano.SetFile( reader.GetFile() );
        ano.SetCryptographicMessageSyntax( cms );
        if( !ano.BasicApplicationLevelConfidentialityProfile() )
        {
            return 1;
        }
        Writer writer = new Writer();
        writer.SetFileName( file2 );
        writer.SetFile( ano.GetFile() );
        ret = writer.Write();
        if( !ret )
        {
            return 1;
        }
        return 0;
    }
}

```

## 12.16 BasicImageAnonymizer.cs

```

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=====*/
/*
*/
using System;
using gdcm;
public class BasicImageAnonymizer

```

```

{
    public static int Main(string[] args)
    {
        string filename = args[0];
        // instantiate the reader:
        gdcm.ImageReader reader = new gdcm.ImageReader();
        reader.SetFileName( filename );
        if (!reader.Read()) return 1;
        Image ir = reader.GetImage();
        uint[] dims = {0, 0, 0};
        dims[0] = ir.GetDimension(0);
        dims[1] = ir.GetDimension(1);
        dims[2] = ir.GetDimension(2);
        System.Console.WriteLine( "Dim:" + dims[0] );
        System.Console.WriteLine( "Dim:" + dims[1] );
        System.Console.WriteLine( "Dim:" + dims[2] );
        // buffer to get the pixels
        byte[] buffer = new byte[ ir.GetBufferLength() ];
        System.Console.WriteLine( "Dim:" + ir.GetBufferLength() );
        ir.GetBuffer( buffer );
        for (uint z = 0; z < dims[2]; z++)
        {
            for (uint y = 0; y < dims[1] / 2; y++) // only half Y
            {
                for (uint x = 0; x < dims[0] / 2; x++) // only half X
                {
                    buffer[ (z * dims[1] + y) * dims[0] + x ] = 0; // works when pixel type == UINT8
                }
            }
        }
        DataElement pixeldata = new DataElement( new Tag(0x7fe0,0x0010) );
        pixeldata.SetByteValue( buffer, new VL( (uint)buffer.Length ) );
        ir.SetDataElement( pixeldata );
        ir.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.ExplicitVRLittleEndian ) );
        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLSLossless ) );
        change.SetInput( ir );
        if ( !change.Change() )
        {
            System.Console.WriteLine( "Could not change: " + filename );
            return 1;
        }
        ImageWriter writer = new ImageWriter();
        writer.SetFileName( "out.dcm" );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( change.GetOutput() );
        bool ret = writer.Write();
        if ( !ret )
        {
            return 1;
        }
        return 0;
    }
}

```

## 12.17 Cleaner.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * mono bin/Cleaner.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;

```

```

public class MyWatcher : SimpleSubjectWatcher
{
    public MyWatcher(Subject s):base(s,"Override String"){
    protected override void StartFilter() {
        System.Console.WriteLine( "This is my start" );
    }
    protected override void EndFilter(){
        System.Console.WriteLine( "This is my end" );
    }
    protected override void ShowProgress(Subject caller, Event evt){
        ProgressEvent pe = ProgressEvent.Cast(evt);
        System.Console.WriteLine( "This is my progress:  " + pe.GetProgress() );
    }
    protected override void ShowIteration(){
        System.Console.WriteLine( "This is my iteration" );
    }
    protected override void ShowAnonymization(Subject caller, Event evt){
/*
* A couple of explanation are necessary here to understand how SWIG work
* http://www.swig.org/Doc1.3/Java.html#adding_downcasts
*
* System.Console.WriteLine( "This is my Anonymization.  Type:  " + evt.GetEventName() );
* System.Type type = evt.GetType();
* System.Console.WriteLine( "This is my Anonymization.  System.Type:  " + type.ToString() );
* System.Console.WriteLine( "This is my Anonymization.  CheckEvent:  " + ae.CheckEvent( evt ) );
* System.Console.WriteLine( "This is my Anonymization.  Processing Tag #" + ae.GetTag().toString() );
*/
        AnonymizeEvent ae = AnonymizeEvent.Cast(evt);
        if( ae != null )
        {
            Tag t = ae.GetTag();
            System.Console.WriteLine( "This is my Anonymization.  Processing Tag #" + t.toString() );
        }
        else
        {
            System.Console.WriteLine( "This is my Anonymization.  Unhandled Event type:  " + evt.GetEventName() );
        }
    }
    protected override void ShowAbort(){
        System.Console.WriteLine( "This is my abort" );
    }
}
public class Cleaner
{
    public static int Main(string[] args)
    {
        gdcm.Global global = gdcm.Global.GetInstance();
        if( !global.LoadResourcesFiles() )
        {
            System.Console.WriteLine( "Could not LoadResourcesFiles" );
            return 1;
        }
        string file1 = args[0];
        string file2 = args[1];
        Reader reader = new Reader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        SmartPtrCleaner scleaner = gdcm.Cleaner.New();
        gdcm.Cleaner cleaner = scleaner.__ref__();
        //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(cleaner, "Anonymizer");
        MyWatcher watcher = new MyWatcher(cleaner);
        cleaner.SetFile( reader.GetFile() );
        cleaner.Empty( new gdcm.VR(gdcm.VR.VRType.PN) );
        gdcm.DPath dpath = new gdcm.DPath();
        dpath.ConstructFromString( "/0010,0010" );
        cleaner.Preserve( dpath );
        gdcm.Tag t1 = new gdcm.Tag(0x10, 0x30);
        cleaner.Empty( t1 );
        gdcm.PrivateTag pt0 = new gdcm.PrivateTag( new gdcm.Tag(0x29,0x60), "SIEMENS MEDCOM HEADER2" );
        cleaner.Remove( pt0 );
        gdcm.PrivateTag pt1 = new gdcm.PrivateTag( new gdcm.Tag(0x29,0x10), "SIEMENS CSA HEADER" );
        gdcm.PrivateTag pt2 = new gdcm.PrivateTag( new gdcm.Tag(0x29,0x20), "SIEMENS CSA HEADER" );
        cleaner.Scrub( pt1 );
        cleaner.Scrub( pt2 );
        if( !cleaner.Clean() )
        {
            return 1;
        }
    }
}

```

```

    }
    Writer writer = new Writer();
    writer.SetFileName( file2 );
    writer.SetFile( cleaner.GetFile() );
    ret = writer.Write();
    if( !ret )
    {
        return 1;
    }
    return 0;
}
}

```

## 12.18 CompressLossyJPEG.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm/debug-gcc/bin
 * $ mono bin/CompressLossyJPEG.exe input.dcm output.dcm
 */
using System;
using gdcm;
public class CompressLossyJPEG
{
    public static int Main(string[] args)
    {
        if( args.Length < 2 )
        {
            System.Console.WriteLine( " input.dcm output.dcm" );
            return 1;
        }
        string filename = args[0];
        string outfilename = args[1];
        ImageReader reader = new ImageReader();
        reader.SetFileName( filename );
        if( !reader.Read() )
        {
            System.Console.WriteLine( "Could not read:  " + filename );
            return 1;
        }
        // The output of gdcm::Reader is a gdcm::File
        File file = reader.GetFile();
        // the dataset is the the set of element we are interested in:
        DataSet ds = file.GetDataSet();
        Image image = reader.GetImage();
        //image.Print( cout );
        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        TransferSyntax targetts = new TransferSyntax( TransferSyntax.TSType.JPEGBaselineProcess1 );
        change.SetTransferSyntax( targetts );
        // Setup our JPEGCodec, warning it should be compatible with JPEGBaselineProcess1
        JPEGCodec jpegcodec = new JPEGCodec();
        if( !jpegcodec.CanCode( targetts ) )
        {
            System.Console.WriteLine( "Something went really wrong, JPEGCodec cannot handle JPEGBaselineProcess1" );
            return 1;
        }
        jpegcodec.SetLossless( false );
        jpegcodec.SetQuality( 50 ); // poor quality !
        change.SetUserCodec( jpegcodec ); // specify the codec to use to the ImageChangeTransferSyntax
        change.SetInput( image );
        bool b = change.Change();
        if( !b )
        {
            System.Console.WriteLine( "Could not change the Transfer Syntax" );
        }
    }
}

```



```

        return 1;
    }
    ImageWriter writer = new ImageWriter();
    writer.SetImage( (gdcm.Image)change.GetOutput() );
    writer.SetFile( reader.GetFile() );
    writer.SetFileName( outfilename );
    if( !writer.Write() )
    {
        System.Console.WriteLine( "Could not write: " + outfilename );
        return 1;
    }
    return 0;
}
}

```

## 12.19 DecompressImageMultiframe.cs

```

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=====*/
/*
$ gdcminfo ~/Desktop/angiogram-06.dcm
MediaStorage is 1.2.840.10008.5.1.4.1.1.12.1 [X-Ray Angiographic Image Storage]
TransferSyntax is 1.2.840.10008.1.2.4.50 [JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8
  Bit Image Compression]
NumberOfDimensions: 3
Dimensions: (512,512,355)
Origin: (0,0,0)
Spacing: (1,1,40)
DirectionCosines: (1,0,0,0,1,0)
Rescale Intercept/Slope: (0,1)
SamplesPerPixel :1
BitsAllocated :8
BitsStored :8
HighBit :7
PixelRepresentation:0
ScalarType found :UINT8
PhotometricInterpretation: MONOCHROME2
PlanarConfiguration: 0
TransferSyntax: 1.2.840.10008.1.2.4.50
Orientation Label: AXIAL
*/
/*
* Description:
*
* Assume we have a file angiogram-06.dcm as described above.
* the following program will decompress directly from the extracted jpeg stream.
*
* First step extract the jpeg stream (but not the Basic Offset Table):
*
* $ gdcmrw -i angiogram-06.dcm -o /tmp/output/chris --split-frags --pattern %d.jpg
*
* Check that indeed there are 355 files, while there are 356 fragments in the original DICOM file, since
* gdcmrw always skip the first fragment (Basic Offset Table).
*
* Now from those individual jpeg stream, recreate a fake gdcm.DataElement...
*
* Usage:
*
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
* $ mono ./bin/DecompressImageMultiframe.exe /tmp/output
*/
using System;
using gdcm;
public class DecompressImageMultiframe
{
    public static int Main(string[] args)

```

```

{
    string directory = args[0];
    gdcm.Directory dir = new gdcm.Directory();
    uint nfiles = dir.Load(directory);
    //System.Console.WriteLine(dir.toString());
    gdcm.FilenamesType filenames = dir.GetFilenames();
    Image image = new Image();
    image.SetNumberOfDimensions( 3 ); // important for now
    DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );
    // Create a new SequenceOfFragments C++ object, store it as a SmartPointer :
    SmartPtrFrag sq = SequenceOfFragments.New();
    // Yeah, the file are not guarantee to be in order, please adapt...
    for(uint i = 0; i < nfiles; ++i)
    {
        System.Console.WriteLine( filenames[(int)i] );
        string file = filenames[(int)i];
        System.IO.FileStream infile =
            new System.IO.FileStream(file, System.IO.FileMode.Open, System.IO.FileAccess.Read);
        uint fsize = gdcm.PosixEmulation.FileSize(file);
        byte[] jstream = new byte[fsize];
        infile.Read(jstream, 0 , jstream.Length);
        Fragment frag = new Fragment();
        frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
        sq.AddFragment( frag );
    }
    // Pass by reference:
    pixeldata.SetValue( sq.__ref__() );
    // insert:
    image.SetDataElement( pixeldata );
    // JPEG use YBR to achieve better compression ratio by default (not RGB)
    // FIXME hardcoded:
    PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
    );
    image.SetPhotometricInterpretation( pi );
    // FIXME hardcoded:
    PixelFormat pixeltype = new PixelFormat(1,8,8,7);
    image.SetPixelFormat( pixeltype );
    // FIXME hardcoded:
    image.SetTransferSyntax( new TransferSyntax( TransferSyntax.TSType.JPEGLosslessProcess14_1 ) );
    image.SetDimension(0, 512);
    image.SetDimension(1, 512);
    image.SetDimension(2, 355);
    // Decompress !
    byte[] decompressedData = new byte[(int)image.GetBufferLength()];
    image.GetBuffer(decompressedData);
    // Write out the decompressed bytes
    System.Console.WriteLine(image.toString());
    using (System.IO.Stream stream =
        System.IO.File.Open(@"tmp/dd.raw",
            System.IO.FileMode.Create))
    {
        System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
        writer.Write(decompressedData);
    }
    return 0;
}
}

```

## 12.20 DumpCSA.cs

```

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=====*/
/*
 * Usage:
 * $ bin/DumpCSA.exe input.dcm
 */

```

```

using System;
using gdcmm;
public class DumpCSA
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        gdcmm.Reader reader = new gdcmm.Reader();
        reader.SetFileName( filename );
        if (!reader.Read()) return 1;
        gdcmm.File f = reader.GetFile();
        gdcmm.DataSet ds = f.GetDataSet();
        string[] expectedSiemensTags = new string[] { "B_value", "AcquisitionMatrixText" };
        using (PrivateTag gtag = CSAHeader.GetCSAImageHeaderInfoTag())
        {
            if (ds.FindDataElement(gtag))
            {
                using (DataElement de = ds.GetDataElement(gtag))
                {
                    if (de != null && !de.IsEmpty())
                    {
                        using (CSAHeader csa = new CSAHeader())
                        {
                            if (csa.LoadFromDataElement(de))
                            {
                                foreach (string str in expectedSiemensTags)
                                {
                                    if (csa.FindCSAElementByName(str))
                                    {
                                        using (CSAElement elem = csa.GetCSAElementByName(str))
                                        {
                                            if (elem != null)
                                            {
                                                System.Console.WriteLine( elem.toString() );
                                            }
                                        }
                                    }
                                }
                            }
                        }
                    }
                }
            }
        }
        return 0;
    }
}

```

## 12.21 ExtractEncapsulatedFile.cs

```

/*=====

```

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```

=====*/

```

```

/*
 * This example shows how one from C# context can extract a binary blob
 * and write out as a file.
 * This example is meant for pdf encapsulated file, but can be adapted for other type
 * of binary blob.
 *
 * DICOM file is:
 * ...
 * (0042,0010) ST (no value available) # 0, 0 DocumentTitle
 * (0042,0011) OB 25\50\44\46\2d\31\2e\32\20\0d\25\e2\e3\cf\d3\20\0d\31\30\20\30\20... # 40718, 1
 * EncapsulatedDocument
 * (0042,0012) LO [application/pdf] # 16, 1 MIMETimeTypeOfEncapsulatedDocument
 * ...
 *
 */

```

```

* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
* $ mono bin/ExtractEncapsulatedFile.exe some_pdf_encapsulated.dcm
*/
using System;
using gdcm;
public class ExtractEncapsulatedFile
{
    public static int Main(string[] args)
    {
        string file = args[0];
        Reader reader = new Reader();
        reader.SetFileName( file );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();
        Tag tencapsulated_stream = new Tag(0x0042,0x0011); // Encapsulated Document
        if( !ds.FindDataElement( tencapsulated_stream ) )
        {
            return 1;
        }
        // else
        DataElement de = ds.GetDataElement( tencapsulated_stream );
        ByteValue bv = de.GetByteValue();
        uint len = bv.GetLength();
        byte[] encapsulated_stream = new byte[len];
        bv.GetBuffer( encapsulated_stream, len );
        // Write out the decompressed bytes
        //System.Console.WriteLine(image.toString());
        using (System.IO.Stream stream =
            System.IO.File.Open(@"tmp/dd.pdf",
                System.IO.FileMode.Create))
        {
            System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
            writer.Write( encapsulated_stream );
        }
        return 0;
    }
}

```

## 12.22 ExtractImageRegion.cs

```

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
* This small code shows how to use the gdcm.ImageRegionReader API
* In this example we are taking each frame by frame and dump them to
* /tmp/frame.raw.
*
* Usage:
* $ bin/ExtractImageRegion.exe input.dcm
*
* Example:
* $ bin/ExtractImageRegion.exe gdcmData/012345.002.050.dcm
* $ md5sum /tmp/frame.raw
* d594a5e2fde12f32b6633ca859b4d4a6 /tmp/frame.raw
* $ gdcminfo --md5sum gdcmData/012345.002.050.dcm
* [...]
* md5sum: d594a5e2fde12f32b6633ca859b4d4a6
*/
using System;
using gdcm;

```

```

public class ExtractImageRegion
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        uint file_size = gdcm.PosixEmulation.FileSize(filename);
        // instantiate the reader:
        gdcm.ImageRegionReader reader = new gdcm.ImageRegionReader();
        reader.SetFileName( filename );
        // pull DICOM info:
        if (!reader.ReadInformation()) return 1;
        // store current offset:
        uint cur_pos = reader.GetStreamCurrentPosition();
        uint remaining = file_size - cur_pos;
        Console.WriteLine("Remaining bytes to read (Pixel Data): " + remaining.ToString() );
        // Get file infos
        gdcm.File f = reader.GetFile();
        // get some info about image
        UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
        PixelFormat pf = ImageHelper.GetPixelFormatValue(f);
        int pixelsize = pf.GetPixelSize();
        PhotometricInterpretation pi = ImageHelper.GetPhotometricInterpretationValue(f);
        Console.WriteLine( pi.ToString() );
        // buffer to get the pixels
        byte[] buffer = new byte[ dims[0] * dims[1] * pixelsize ];
        // define a simple box region.
        BoxRegion box = new BoxRegion();
        for (uint z = 0; z < dims[2]; z++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            // and do that for each z:
            box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
            //System.Console.WriteLine( box.ToString() );
            reader.SetRegion( box );
            // reader will try to load the uncompressed image region into buffer.
            // the call returns an error when buffer.Length is too small. For instance
            // one can call:
            // uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
            // to get the exact size of minimum buffer
            if (reader.ReadIntoBuffer(buffer, (uint)buffer.Length))
            {
                using (System.IO.Stream stream =
                    System.IO.File.Open(@"tmp/frame.raw",
                        System.IO.FileMode.Create))
                {
                    System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
                    writer.Write(buffer);
                }
            }
            else
            {
                throw new Exception("can't read pixels error");
            }
        }
        return 0;
    }
}

```

## 12.23 ExtractImageRegionWithLUT.cs

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.

```

```

* Furthermore we are applying the LUT on this image.
* Special care should be taken in case the image is not PALETTE COLOR
*
* Usage:
* $ bin/ExtractImageRegionWithLUT.exe input.dcm
*
* Example:
* $ bin/ExtractImageRegionWithLUT.exe gdcData/rle16l00.dcm
* $ md5sum /tmp/frame_rgb.raw
* 73bf61325fdb6e2830244a2b7b0c4ae2 /tmp/frame_rgb.raw
* $ gdcnimg --depth 16 --spp 3 --size 600,430 /tmp/frame_rgb.raw rgb.dcm
* $ gdcviewer rgb.dcm
*/
using System;
using gdc;
public class ExtractImageRegion
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        // instantiate the reader:
        gdc.ImageRegionReader reader = new gdc.ImageRegionReader();
        reader.SetFileName( filename );
        // pull DICOM info:
        if (!reader.ReadInformation()) return 1;
        // Get file infos
        gdc.File f = reader.GetFile();
        gdc.LookupTable lut = reader.GetImage().GetLUT();
        // get some info about image
        UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
        PixelFormat pf = ImageHelper.GetPixelFormatValue(f);
        int pixsize = pf.GetPixelSize();
        // buffer to get the pixels
        byte[] buffer = new byte[ dims[0] * dims[1] * pixsize ];
        // output buffer for the RGB decoded image:
        byte[] buffer2 = new byte[ dims[0] * dims[1] * pixsize * 3 ];
        // define a simple box region.
        BoxRegion box = new BoxRegion();
        for (uint z = 0; z < dims[2]; z++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            // and do that for each z:
            box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
            //System.Console.WriteLine( box.ToString() );
            reader.SetRegion( box );
            // reader will try to load the uncompressed image region into buffer.
            // the call returns an error when buffer.Length is too small. For instance
            // one can call:
            // uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
            // to get the exact size of minimum buffer
            if (reader.ReadIntoBuffer(buffer, (uint)buffer.Length))
            {
                if ( !lut.Decode( buffer2, (uint)buffer2.Length, buffer, (uint)buffer.Length ) )
                {
                    throw new Exception("can't decode");
                }
                using (System.IO.Stream stream =
                    System.IO.File.Open(@"tmp/frame_rgb.raw",
                        System.IO.FileMode.Create))
                {
                    System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
                    writer.Write(buffer2);
                }
            }
            else
            {
                throw new Exception("can't read pixels error");
            }
        }
        return 0;
    }
}

```

## 12.24 ExtractOneFrame.cs

```

/*=====

```

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```

=====*/
/*
 * This small code shows how to use the gdcm.StreamImageReader API
 * to read a single (whole) frame at a time
 * The API allow extracting a smaller extent of the frame of course.
 * It will write out the extracted frame in /tmp/frame.raw
 *
 * Usage:
 * $ bin/ExtractOneFrame.exe input.dcm
 */
using System;
using gdcm;
public class ExtractOneFrame
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        gdcm.StreamImageReader reader = new gdcm.StreamImageReader();
        reader.SetFileName( filename );
        if (!reader.ReadImageInformation()) return 1;
        // Get file infos
        gdcm.File f = reader.GetFile();
        // get some info about image
        UIntArrayType extent = ImageHelper.GetDimensionsValue(f);
        //System.Console.WriteLine( extent[0] );
        uint dimx = extent[0];
        //System.Console.WriteLine( extent[1] );
        uint dimy = extent[1];
        //System.Console.WriteLine( extent[2] );
        uint dimz = extent[2];
        PixelFormat pf = ImageHelper.GetPixelFormatValue(f);
        int pixelsize = pf.GetPixelSize();
        //System.Console.WriteLine( pixelsize );
        // buffer to get the pixels
        byte[] buffer = new byte[ dimx * dimy * pixelsize ];
        for (int i = 0; i < dimz; i++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            reader.DefinePixelExtent(0, (ushort)dimx, 0, (ushort)dimy, (ushort)i, (ushort)(i+1));
            uint buf_len = reader.DefineProperBufferLength(); // take into account pixel size
            //System.Console.WriteLine( buf_len );
            if( buf_len > buffer.Length )
            {
                throw new Exception("buffer is too small for target");
            }
            if (reader.Read(buffer, (uint)buffer.Length))
            {
                using (System.IO.Stream stream =
                    System.IO.File.Open(@"tmp/frame.raw",
                        System.IO.FileMode.Create))
                {
                    System.IO.BinaryWriter writer = new System.IO.BinaryWriter(stream);
                    writer.Write(buffer);
                }
            }
            else
            {
                throw new Exception("can't read pixels error");
            }
        }
        return 0;
    }
}

```

## 12.25 FileAnonymize.cs

```

/*=====

```

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```

=====*/
/*
 * Simple C# example
 *
 * Usage:
 * $ mono bin/FileAnonymize.exe input.dcm output.dcm
 */
using System;
using gdcm;
public class FileAnonymize
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];
        gdcm.FileAnonymizer fa = new gdcm.FileAnonymizer();
        fa.SetInputFileName( filename );
        fa.SetOutputFileName( outfilename );
        // Empty Operations
        // It will create elements, since those tags are non-registered public elements (2011):
        fa.Empty( new Tag(0x0008,0x1313) );
        fa.Empty( new Tag(0x0008,0x1317) );
        // Remove Operations
        // The following Tag are actually carefully chosen, since they refer to SQ:
        fa.Remove( new Tag(0x0008,0x2112) );
        fa.Remove( new Tag(0x0008,0x9215) );
        // Replace Operations
        // do not call replace operation on SQ attribute !
        fa.Replace( new Tag(0x0018,0x5100), "MYVALUE " );
        fa.Replace( new Tag(0x0008,0x1160), "MYOTHERVAL" );
        if( !fa.Write() )
        {
            System.Console.WriteLine( "Could not write" );
            return 1;
        }
        return 0;
    }
}

```

## 12.26 FileChangeTS.cs

```

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=====*/
/*
 * Simple C# example
 *
 * Shows multiple steps:
 * Steps 1.
 * Create a fake (dummy) DICOM file, with size 512 x 512 x 2 We use a small
 * image to be able to create the volume in memory Of course you can use any
 * existing DICOM instead
 *
 * Step 2.
 * Hack the DICOM file to pretend the number of frames is 1000 (instead of 2)
 * At this point in time this makes the DICOM file invalid (truncated). But the

```



```

* next step will fix this.
*
* Step 3.
* Use C# to create a binary data which will represent our source object for
* image.
*
* Step 4.
* We use gdcm.FileStreamer to merge the template DICOM file from Step 2, with
* the binary data from Step 3. We decide to read a scanline at a time, but
* this can be read with any number of bytes. AppendToDataElement() will always
* do the proper computation.
*
* Step 5.
* We compress this gigantic file, into [JPEG Lossless, Non-Hierarchical,
* First-Order Prediction (Process 14 [Selection Value 1])]
*
* Usage:
* $ mono bin/FileChangeTS.exe small.dcm big.dcm raw.data merge.dcm jpeg.dcm
*/
using System;
using System.IO;
using gdcm;
public class FileChangeTS
{
    public static byte[] StrToByteArray(string str)
    {
        System.Text.ASCIIEncoding encoding=new System.Text.ASCIIEncoding();
        return encoding.GetBytes(str);
    }
    // Create a 256 x 256 Secondary Capture Image Storage
    static private void CreateSmallDICOM(string fileName)
    {
        using( var writer = new gdcm.PixmapWriter() )
        {
            gdcm.Pixmap img = writer.GetImage();
            img.SetNumberOfDimensions( 3 );
            img.SetDimension(0, 512 );
            img.SetDimension(1, 512 );
            img.SetDimension(2, 2 ); // fake a 3d volume
            PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
            );
            img.SetPhotometricInterpretation( pi );
            gdcm.DataElement pixeldata = new gdcm.DataElement( new gdcm.Tag(0x7fe0,0x0010) );
            byte[] buffer = new byte[ 512 * 512 * 2 ];
            pixeldata.SetByteValue( buffer, new gdcm.VL((uint)buffer.Length) );
            img.SetDataElement( pixeldata );
            gdcm.File file = writer.GetFile();
            gdcm.DataSet ds = file.GetDataSet();
            gdcm.DataElement ms = new gdcm.DataElement(new gdcm.Tag(0x0008,0x0016));
            string mediastorage = "1.2.840.10008.5.1.4.1.1.7.2"; // Multi-frame Grayscale Byte Secondary Capture Image
            Storage
            byte[] val = StrToByteArray(mediastorage);
            ms.SetByteValue( val, new gdcm.VL( (uint)val.Length) );
            ds.Insert( ms );
            writer.SetFileName( fileName );
            writer.Write();
        }
    }
    static private void CreateBigDICOM(string fileName, string outfilename)
    {
        using( var ano = new gdcm.FileAnonymizer() )
        {
            // The following is somewhat dangerous, do not try at home:
            string nframes = "1000";
            ano.Replace( new gdcm.Tag(0x0028,0x0008), nframes );
            ano.SetInputFileName(fileName);
            ano.SetOutputFileName(outfilename);
            ano.Write(); // at this point the DICOM is invalid !
        }
    }
    static private void CreateDummyFile(string fileName, long length)
    {
        using (var fileStream = new FileStream(fileName, FileMode.Create, FileAccess.Write, FileShare.None))
        {
            // Looks like C# always init to 0 (fallocate ?)
            // For the purpose of the test we could add some random noise
            fileStream.SetLength(length);
        }
    }
    static private void ReadBytesIntoArray( byte[] array, FileStream source )
    {

```

```

int numBytesToRead = array.Length;
int numBytesRead = 0;
while (numBytesToRead > 0)
{
    // According to spec: Read() may return anything from 0 to numBytesToRead.
    int n = source.Read(array, numBytesRead, numBytesToRead);
    // Break when the end of the file is reached.
    if (n == 0)
        break;
    numBytesRead += n;
    numBytesToRead -= n;
}
}

static private void AssembleDICOMAndRaw(string dicomfn, string rawdata, string outfn)
{
    using ( var fs = new gdcm.FileStreamer() )
    {
        fs.SetTemplateFileName(dicomfn);
        fs.SetOutputFileName(outfn);
        gdcm.Tag pixeldata = new gdcm.Tag(0x7fe0, 0x0010);
        // FileStreamer support automatic checking of pixel data length
        // based on DICOM attributes, only if we say so:
        fs.CheckDataElement( pixeldata );
        // Declare we are working on Pixel Data attribute:
        fs.StartDataElement( pixeldata );
        using (FileStream rawSource = new FileStream(rawdata,
            FileMode.Open, FileAccess.Read))
        {
            byte[] bytes = new byte[512];
            // Only read one scanline at a time
            // We could have been reading more at once, if this is more efficient,
            // AppendToDataElement will do the logic in all cases.
            for( int i = 0; i < 512 * 1000; ++i )
            {
                // Read the source file into a byte array.
                ReadBytesIntoArray( bytes, rawSource );
                fs.AppendToDataElement( pixeldata, bytes, (uint)bytes.Length );
            }
        }
        if( !fs.StopDataElement( pixeldata ) )
        {
            // Most likely an issue with Pixel Data Length computation:
            throw new Exception("StopDataElement failed");
        }
    }
}

static private void CompressIntoJPEG(string rawdicom, string jpegdicom)
{
    using( var sfcts = FileChangeTransferSyntax.New() )
    {
        // Need to retrieve the actual C++ reference, to pass to
        // SimpleSubjectWatcher:
        FileChangeTransferSyntax fcts = sfcts.__ref__();
        SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(fcts, "FileChangeTransferSyntax");
        gdcm.TransferSyntax ts = new TransferSyntax( TransferSyntax.TType.JPEGLosslessProcess14_1 );
        fcts.SetTransferSyntax( ts );
        fcts.SetInputFileName( rawdicom );
        fcts.SetOutputFileName( jpegdicom );
        fcts.Change();
    }
}

public static int Main(string[] args)
{
    string filename = args[0];
    string outfilename = args[1];
    string rawfilename = args[2];
    string mergefn = args[3];
    string jpegfn = args[4];
    CreateSmallDICOM(filename);
    CreateBigDICOM(filename, outfilename);
    CreateDummyFile(rawfilename, 512 * 512 * 1000 );
    AssembleDICOMAndRaw(outfilename, rawfilename, mergefn);
    CompressIntoJPEG(mergefn, jpegfn);
    return 0;
}
}

```

## 12.27 FileChangeTSLossy.cs

```

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PURPOSE.  See the above copyright notice for more information.

=====*/
/*
 * Simple C# example
 *
 * Shows multiple steps:
 * Steps 1.
 * Create a fake (dummy) DICOM file, with size 512 x 512 x 2 We use a small
 * image to be able to create the volume in memory Of course you can use any
 * existing DICOM instead
 *
 * Step 2.
 * Hack the DICOM file to pretend the number of frames is 1000 (instead of 2)
 * At this point in time this makes the DICOM file invalid (truncated). But the
 * next step will fix this.
 *
 * Step 3.
 * Use C# to create a binary data which will represent our source object for
 * image.
 *
 * Step 4.
 * We use gdcm.FileStreamer to merge the template DICOM file from Step 2, with
 * the binary data from Step 3. We decide to read a scanline at a time, but
 * this can be read with any number of bytes. AppendToDataElement() will always
 * do the proper computation.
 *
 * Step 5.
 * We compress this gigantic file, into [JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit
 * Image Compression]
 *
 * Usage:
 * $ bin/FileChangeTSLossy.exe small.dcm big.dcm raw.data merge.dcm jpeg.dcm
 */
using System;
using System.IO;
using gdcm;
public class FileChangeTS
{
    public static byte[] StrToByteArray(string str)
    {
        System.Text.ASCIIEncoding encoding=new System.Text.ASCIIEncoding();
        return encoding.GetBytes(str);
    }
    // Create a 256 x 256 Secondary Capture Image Storage
    static private void CreateSmallDICOM(string fileName)
    {
        using( var writer = new gdcm.PixmapWriter() )
        {
            gdcm.Pixmap img = writer.GetImage();
            img.SetNumberOfDimensions( 3 );
            img.SetDimension(0, 512 );
            img.SetDimension(1, 512 );
            img.SetDimension(2, 2 ); // fake a 3d volume
            PhotometricInterpretation pi = new PhotometricInterpretation( PhotometricInterpretation.PIType.MONOCHROME2
            );
            img.SetPhotometricInterpretation( pi );
            gdcm.DataElement pixeldata = new gdcm.DataElement( new gdcm.Tag(0x7fe0,0x0010) );
            byte[] buffer = new byte[ 512 * 512 * 2 ];
            pixeldata.SetByteValue( buffer, new gdcm.VL((uint)buffer.Length) );
            img.SetDataElement( pixeldata );
            gdcm.File file = writer.GetFile();
            gdcm.DataSet ds = file.GetDataSet();
            gdcm.DataElement ms = new gdcm.DataElement(new gdcm.Tag(0x0008,0x0016));
            string mediastorage = "1.2.840.10008.5.1.4.1.1.7.2"; // Multi-frame Grayscale Byte Secondary Capture Image
            Storage
            byte[] val = StrToByteArray(mediastorage);
            ms.SetByteValue( val, new gdcm.VL( (uint)val.Length) );

```

```

        ds.Insert( ms );
        writer.SetFileName( fileName );
        writer.Write();
    }
}

static private void CreateBigDICOM(string fileName, string outfilename)
{
    using( var ano = new gdcm.FileAnonymizer() )
    {
        // The following is somewhat dangerous, do not try at home:
        string nframes = "1000";
        ano.Replace( new gdcm.Tag(0x0028,0x0008), nframes );
        ano.SetInputFileName(fileName);
        ano.SetOutputFileName(outfilename);
        ano.Write(); // at this point the DICOM is invalid !
    }
}

static private void CreateDummyFile(string fileName, long length)
{
    using (var fileStream = new FileStream(fileName, FileMode.Create, FileAccess.Write, FileShare.None))
    {
        // Looks like C# always init to 0 (fallocate ?)
        // For the purpose of the test we could add some random noise
        fileStream.SetLength(length);
    }
}

static private void ReadBytesIntoArray( byte[] array, FileStream source )
{
    int numBytesToRead = array.Length;
    int numBytesRead = 0;
    while (numBytesToRead > 0)
    {
        // According to spec: Read() may return anything from 0 to numBytesToRead.
        int n = source.Read(array, numBytesRead, numBytesToRead);
        // Break when the end of the file is reached.
        if (n == 0)
            break;
        numBytesRead += n;
        numBytesToRead -= n;
    }
}

static private void AssembleDICOMAndRaw(string dicomfn, string rawdata, string outfn)
{
    using ( var fs = new gdcm.FileStreamer() )
    {
        fs.SetTemplateFileName(dicomfn);
        fs.SetOutputFileName(outfn);
        gdcm.Tag pixeldata = new gdcm.Tag(0x7fe0, 0x0010);
        // FileStreamer support automatic checking of pixel data length
        // based on DICOM attributes, only if we say so:
        fs.CheckDataElement( pixeldata );
        // Declare we are working on Pixel Data attribute:
        fs.StartDataElement( pixeldata );
        using (FileStream rawSource = new FileStream(rawdata,
            FileMode.Open, FileAccess.Read))
        {
            byte[] bytes = new byte[512];
            // Only read one scanline at a time
            // We could have been reading more at once, if this is more efficient,
            // AppendToDataElement will do the logic in all cases.
            for( int i = 0; i < 512 * 1000; ++i )
            {
                // Read the source file into a byte array.
                ReadBytesIntoArray( bytes, rawSource );
                fs.AppendToDataElement( pixeldata, bytes, (uint)bytes.Length );
            }
        }
        if( !fs.StopDataElement( pixeldata ) )
        {
            // Most likely an issue with Pixel Data Length computation:
            throw new Exception("StopDataElement failed");
        }
    }
}

static private void CompressIntoJPEG(string rawdicom, string jpegdicom)
{
    using( var sfcts = FileChangeTransferSyntax.New() )
    {
        // Need to retrieve the actual C++ reference, to pass to
        // SimpleSubjectWatcher:
        FileChangeTransferSyntax fcts = sfcts.__ref__();
    }
}

```

```

SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(fcts, "FileChangeTransferSyntax");
gdcm.TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.JPEGBaselineProcess1 );
fcts.SetTransferSyntax( ts );
ImageCodec ic = fcts.GetCodec();
JPEGCodec jpeg = JPEGCodec.Cast( ic );
jpeg.SetLossless( false );
jpeg.SetQuality( 50 ); // poor quality !
fcts.SetInputFileName( rawdicom );
fcts.SetOutputFileName( jpegdicom );
fcts.Change();
}
}
public static int Main(string[] args)
{
    string filename = args[0];
    string outfilename = args[1];
    string rawfilename = args[2];
    string mergefn = args[3];
    string jpegfn = args[4];
    CreateSmallDICOM(filename);
    CreateBigDICOM(filename, outfilename);
    CreateDummyFile(rawfilename, 512 * 512 * 1000 );
    AssembleDICOMAndRaw(outfilename, rawfilename, mergefn);
    CompressIntoJPEG(mergefn, jpegfn);
    return 0;
}
}

```

## 12.28 FileStreaming.cs

```

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * Simple C# example
 *
 * Usage:
 * $ mono bin/FileStreaming.exe gdcmData/CT_l6b_signed-UsedBits13.dcm output.dcm
 *
 * The class will take care of group handling and will use the first available group:
 * (0009,0012) ?? (LO) [MYTEST] # 6,1 Private Creator
 */
using System;
using gdcm;
public class FileStreaming
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];
        gdcm.PrivateTag pt = new gdcm.PrivateTag( new gdcm.Tag(0x9,0x10), "MYTEST" );
        gdcm.FileStreamer fs = new gdcm.FileStreamer();
        fs.SetTemplateFileName( filename );
        fs.SetOutputFileName( outfilename );
        byte[] buffer = new byte[ 8192 ];
        uint len = (uint)buffer.Length;
        // In this example, we want that each newly created Private Attribute
        // contains at most 1000 bytes of incoming dataset.
        // We are also calling the function twice to check that appending mode is
        // working from one call to the other. The last element will have a length
        // of (2 * 8192) % 1000 = 384
        if( !fs.StartGroupDataElement( pt, 1000, 1 )
            || !fs.AppendToGroupDataElement( pt, buffer, len )
            || !fs.AppendToGroupDataElement( pt, buffer, len )
            || !fs.StopGroupDataElement( pt ) )
        {
            System.Console.WriteLine( "Could not change private group" );
        }
    }
}

```

```

        return 1;
    }
    return 0;
}
}

```

## 12.29 GetArray.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/GetArray.exe gdcmData/012345.002.050.dcm
 */
using System;
using gdcm;
public class GetArray
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        Image image = reader.GetImage();
        PixelFormat pixeltype = image.GetPixelFormat();
        if( image.GetNumberOfDimensions() != 2 )
        {
            // For the purpose of the test, exit early on
            return 1;
        }
        uint dimx = image.GetDimension(0);
        uint dimy = image.GetDimension(1);
        uint npixels = dimx * dimy;
        //LookupTable lut = image.GetLUT();
        //uint r1 = lut.GetLUTLength( LookupTable.LookupTableType.RED );
        //byte[] rbuf = new byte[ r1 ];
        //uint r12 = lut.GetLUT( LookupTable.LookupTableType.RED, rbuf );
        //assert r1 == r12;
        //byte[] str1 = new byte[ image.GetBufferLength()];
        //image.GetBuffer( str1 );
        if( pixeltype.GetScalarType() == PixelFormat.ScalarType.UINT8 )
        {
            System.Console.WriteLine( "Processing UINT8 image type" );
            byte[] str1 = new byte[ npixels ];
            image.GetArray( str1 );
        }
        else if( pixeltype.GetScalarType() == PixelFormat.ScalarType.INT16 )
        {
            System.Console.WriteLine( "Processing INT16 image type" );
            short[] str1 = new short[ npixels ];
            image.GetArray( str1 );
        }
        else if( pixeltype.GetScalarType() == PixelFormat.ScalarType.UINT16 )
        {
            System.Console.WriteLine( "Processing UINT16 image type" );
            ushort[] str1 = new ushort[ npixels ];
            image.GetArray( str1 );
        }
        else
        {

```

```

        //System.Console.WriteLine( "Default (unhandled pixel format): " + pixeltype.toString() );
        System.Console.WriteLine( "Default (unhandled pixel format): " + pixeltype.GetScalarTypeAsString() );
        // Get bytes
        byte[] str1 = new byte[ image.GetBufferLength() ];
        image.GetBuffer( str1 );
    }
    return 0;
}
}

```

## 12.30 MpegVideoInfo.cs

```

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=====*/
/*
 * This examples takes in a MPEG2 and write out a Video Endoscopic Imagae Storage
 * encoded using MPEG2 @ Main Profile
 * ref: http://chrisa.wordpress.com/2007/11/21/decoding-mpeg2-information/
 * See also:
 * http://dvd.sourceforge.net/dvdinfo/mpeghdrs.html#gop
 * http://cvs.linux.hr/cgi-bin/viewcvs.cgi/mpeg_mod/README.infompeg?view=markup
 * http://www.guru-group.fi/~too/sw/m2vmp2cut/mpeg2info.c
 */
/*
 * Provides information about an MPEG2 file, including the duration, frame rate, aspect
 * ratio, and resolution. Good information about the MPEG2 file structure that helps
 * explain parts of the code can be found here:
 * http://dvd.sourceforge.net/dvdinfo/mpeghdrs.html#gop
 */
 * Copyright (c) 2007 Chris Anderson (chrisa@wordpress.com)
 *
 * This library is free software; you can redistribute it and/or
 * modify it under the terms of the GNU Lesser General Public
 * License as published by the Free Software Foundation; either
 * version 2 of the License, or (at your option) any later version.
 *
 * This library is distributed in the hope that it will be useful,
 * but WITHOUT ANY WARRANTY; without even the implied warranty of
 * MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU
 * Lesser General Public License for more details.
 */
using System;
using System.IO;
using gdcm;
public class Mpeg2VideoInfo
{
    #region Member Variables
        private TimeSpan m_startTime = TimeSpan.Zero;
        private TimeSpan m_endTime = TimeSpan.Zero;
        private TimeSpan m_duration = TimeSpan.Zero;
        private eAspectRatios m_aspectRatio = eAspectRatios.Invalid;
        private eFrameRates m_frameRate = 0;
        private int m_pictureWidth = 0;
        private int m_pictureHeight = 0;
    #endregion
    #region Constants
        private const byte PADDING_PACKET = 0xBE;
        private const byte VIDEO_PACKET = 0xE0;
        private const byte AUDIO_PACKET = 0xC0;
        private const byte SYSTEM_PACKET = 0xBB;
        private const byte TIMESTAMP_PACKET = 0xB8;
        private const byte HEADER_PACKET = 0xB3;
        private const int BUFFER_SIZE = 8162; // 8K buffer
        private readonly static TimeSpan EMPTY_TIMESPAN = new TimeSpan(0, 0, -1);
    #endregion
    #region Enumerations

```

```

public enum eFrameRates
{
    Invalid,
    PulldownNTSC,          // 24000d/1001d = 23.976 Hz
    Film,                  // 24 Hz
    PAL,                   // 25 Hz
    NTSC,                  // 30000d/1001d = 29.97 Hz
    DropFrameNTSC,         // 30 Hz
    DoubleRatePAL,         // 50 Hz
    DoubleRateNTSC,        // 59.97 Hz
    DoubleRateDropFrameNTSC // 60 Hz
}

public enum eAspectRatios
{
    Invalid,
    VGA,                // 1/1
    StandardTV,         // 4/3
    LargeTV,            // 16/9
    Cinema              // 2.21/1
}
}
#endregion
#region Constructor
public MPEG2VideoInfo(string file)
{
    ParseMpeg(file);
}
#endregion
#region Public Properties
public TimeSpan StartTime
{
    get { return m_startTime; }
}
public TimeSpan EndTime
{
    get { return m_endTime; }
}
public TimeSpan Duration
{
    get { return m_duration; }
}
public eAspectRatios AspectRatio
{
    get { return m_aspectRatio; }
}
public eFrameRates FrameRate
{
    get { return m_frameRate; }
}
public int PictureWidth
{
    get { return m_pictureWidth; }
}
public int PictureHeight
{
    get { return m_pictureHeight; }
}
}
#endregion
#region Private Functions
private void ParseMpeg(string file)
{
    FileStream fs = new FileStream(file, FileMode.Open, FileAccess.Read, FileShare.ReadWrite);
    BinaryReader br = new BinaryReader(fs);
    m_startTime = GetStartTimeStampInfo(br);
    m_endTime = GetEndTimeStampInfo(br);
    m_duration = m_endTime.Subtract(m_startTime);
    GetHeaderInfo(br);
    br.Close();
    fs.Close();
}
private TimeSpan GetStartTimeStampInfo(BinaryReader br)
{
    TimeSpan startTime = EMPTY_TIMESPAN;
    byte[] buffer = new byte[BUFFER_SIZE];
    br.BaseStream.Seek(0, SeekOrigin.Begin);
    while (startTime == EMPTY_TIMESPAN && br.BaseStream.Position < br.BaseStream.Length)
    {
        int readBytes = br.Read(buffer, 0, BUFFER_SIZE);
        for (int offset = 0; offset < readBytes - 8; offset++)
        {
            if (IsStreamMarker(ref buffer, offset, TIMESTAMP_PACKET))
            {

```



```

        offset += 4; // Move to the data position which follows the stream header
        uint timeStampEncoded = GetData(ref buffer, offset);
        startTime = DecodeTimeStamp(timeStampEncoded);
        if (startTime != EMPTY_TIMESPAN)
            break;
    }
}
}
return startTime;
}
private TimeSpan GetEndTimeStampInfo(BinaryReader br)
{
    TimeSpan endTime = EMPTY_TIMESPAN;
    byte[] buffer = new byte[BUFFER_SIZE];
    br.BaseStream.Seek(-BUFFER_SIZE, SeekOrigin.End);
    while (endTime == EMPTY_TIMESPAN && br.BaseStream.Position > BUFFER_SIZE)
    {
        int readBytes = br.Read(buffer, 0, BUFFER_SIZE);
        for (int offset = readBytes - 8; offset >= 0; offset--)
        {
            if (IsStreamMarker(ref buffer, offset, TIMESTAMP_PACKET))
            {
                offset += 4; // Move to the data position which follows the stream header
                uint timeStampEncoded = GetData(ref buffer, offset);
                endTime = DecodeTimeStamp(timeStampEncoded);
                if (endTime != EMPTY_TIMESPAN)
                    break;
            }
        }
        br.BaseStream.Seek(-BUFFER_SIZE * 2, SeekOrigin.Current);
    }
    return endTime;
}
private TimeSpan DecodeTimeStamp(uint timeStampEncoded)
{
    TimeSpan timeStamp = EMPTY_TIMESPAN;
    // Mask out the bits containing the property we are after, then
    // shift the data to the right to get its value
    int hour = (int)(timeStampEncoded & 0x7C000000) >> 26; // Bits 31 -> 27
    int minute = (int)(timeStampEncoded & 0x03F00000) >> 20; // Bits 26 -> 21
    int second = (int)(timeStampEncoded & 0x0007E000) >> 13; // Bits 19 -> 14
    int frame = (int)(timeStampEncoded & 0x00001F80) >> 7; // Bits 13 -> 8 - not used, but included for
    completeness
    timeStamp = new TimeSpan(hour, minute, second);
    return timeStamp;
}
private void GetHeaderInfo(BinaryReader br)
{
    byte[] buffer = new byte[BUFFER_SIZE];
    br.BaseStream.Seek(0, SeekOrigin.Begin);
    br.Read(buffer, 0, BUFFER_SIZE);
    for (int offset = 0; offset < buffer.Length - 4; offset++)
    {
        if (IsStreamMarker(ref buffer, offset, HEADER_PACKET))
        {
            offset += 4; // Move to the data position which follows the stream header
            uint headerData = GetData(ref buffer, offset);
            // Mask out the bits containing the property we are after, then
            // shift the data to the right to get its value
            m_pictureWidth = (int)(headerData & 0xFFFF0000) >> 20;
            m_pictureHeight = (int)(headerData & 0x000FFF00) >> 8;
            uint aspectRatioIndex = (headerData & 0x000000F0) >> 4;
            uint fpsIndex = headerData & 0x0000000F;
            m_aspectRatio = (eAspectRatios)fpsIndex;
            m_frameRate = (eFrameRates)fpsIndex;
            break;
        }
    }
}
private uint GetData(ref byte[] buffer, int offset)
{
    return (uint) ((buffer[offset] << 24) |
        (buffer[offset + 1] << 16) |
        (buffer[offset + 2] << 8) |
        (buffer[offset + 3]));
}
private bool IsStreamMarker(ref byte[] buffer, int offset, byte markerType)
{
    return (buffer[offset] == 0x00 &&
        buffer[offset + 1] == 0x00 &&
        buffer[offset + 2] == 0x01 &&

```

```

        buffer[offset + 3] == markerType);
    }
#endregion
public static int Main(string[] args)
{
    string file1 = args[0];
    Mpeg2VideoInfo info = new Mpeg2VideoInfo(file1);
    System.Console.WriteLine( info.StartTime );
    System.Console.WriteLine( info.EndTime );
    System.Console.WriteLine( info.Duration );
    System.Console.WriteLine( info.AspectRatio );
    System.Console.WriteLine( info.FrameRate );
    System.Console.WriteLine( info.PictureWidth );
    System.Console.WriteLine( info.PictureHeight );
    ImageReader r = new ImageReader();
    //Image image = new Image();
    Image image = r.GetImage();
    image.SetNumberOfDimensions( 3 );
    DataElement pixeldata = new DataElement( new gdcm.Tag(0x7fe0,0x0010) );
    System.IO.FileStream infile =
        new System.IO.FileStream(file1, System.IO.FileMode.Open, System.IO.FileAccess.Read);
    uint fsize = gdcm.PosixEmulation.FileSize(file1);
    byte[] jstream = new byte[fsize];
    infile.Read(jstream, 0, jstream.Length);
    SmartPtrFrag sq = SequenceOfFragments.New();
    Fragment frag = new Fragment();
    frag.SetByteValue( jstream, new gdcm.VL( (uint)jstream.Length) );
    sq.AddFragment( frag );
    pixeldata.SetValue( sq.__ref__() );
    // insert:
    image.SetDataElement( pixeldata );
    PhotometricInterpretation pi = new PhotometricInterpretation(
        PhotometricInterpretation.PIType.YBR_PARTIAL_420 );
    image.SetPhotometricInterpretation( pi );
    // FIXME hardcoded:
    PixelFormat pixeltype = new PixelFormat(3,8,8,7);
    image.SetPixelFormat( pixeltype );
    // FIXME hardcoded:
    TransferSyntax ts = new TransferSyntax( TransferSyntax.TSType.MPEG2MainProfile);
    image.SetTransferSyntax( ts );
    image.SetDimension(0, (uint)info.PictureWidth);
    image.SetDimension(1, (uint)info.PictureHeight);
    image.SetDimension(2, 721);
    ImageWriter writer = new ImageWriter();
    gdcm.File file = writer.GetFile();
    file.GetHeader().SetDataSetTransferSyntax( ts );
    Anonymizer anon = new Anonymizer();
    anon.SetFile( file );
    MediaStorage ms = new MediaStorage( MediaStorage.MSType.VideoEndoscopicImageStorage);
    UIDGenerator gen = new UIDGenerator();
    anon.Replace( new Tag(0x0008,0x16), ms.GetString() );
    anon.Replace( new Tag(0x0018,0x40), "25" );
    anon.Replace( new Tag(0x0018,0x1063), "40.000000" );
    anon.Replace( new Tag(0x0028,0x34), "4\\3" );
    anon.Replace( new Tag(0x0028,0x2110), "01" );
    writer.SetImage( image );
    writer.SetFileName( "dummy.dcm" );
    if( !writer.Write() )
    {
        System.Console.WriteLine( "Could not write" );
        return 1;
    }
    return 0;
}
}

```

## 12.31 NewSequence.cs

```

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```

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```

=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/NewSequence.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
//using gdcm;
public class NewSequence
{
    public static byte[] StrToByteArray(string str)
    {
        System.Text.ASCIIEncoding encoding=new System.Text.ASCIIEncoding();
        return encoding.GetBytes(str);
    }
    public static int Main(string[] argv)
    {
        string file1 = argv[0];
        string file2 = argv[1];
        gdcm.Reader r = new gdcm.Reader();
        r.SetFileName( file1 );
        if ( ! r.Read() )
        {
            return 1;
        }
        gdcm.File f = r.GetFile();
        gdcm.DataSet ds = f.GetDataSet();
        // tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
        // Create a dataelement
        gdcm.DataElement de = new gdcm.DataElement(new gdcm.Tag(0x0010, 0x2180));
        string occ = "Occupation";
        de.SetByteValue( StrToByteArray(occ), new gdcm.VL((uint)occ.Length));
        de.SetVR(new gdcm.VR(gdcm.VR.VRType.SH));
        // Create an item
        gdcm.Item it = new gdcm.Item();
        it.SetVLToUndefined(); // Needed to not popup error message
        //it.InsertDataElement(de)
        gdcm.DataSet nds = it.GetNestedDataSet();
        nds.Insert(de);
        // Create a Sequence
        gdcm.SmartPtrSQ sq = gdcm.SequenceOfItems.New();
        sq.SetLengthToUndefined();
        sq.AddItem(it);
        // Insert sequence into data set
        gdcm.DataElement des = new gdcm.DataElement(new gdcm.Tag(0x0400,0x0550));
        des.SetVR(new gdcm.VR(gdcm.VR.VRType.SQ));
        des.SetValue(sq.__ref__());
        des.SetVLToUndefined();
        ds.Insert(des);
        gdcm.Writer w = new gdcm.Writer();
        w.SetFile( f );
        w.SetFileName( file2 );
        if ( !w.Write() )
            return 1;
        return 0;
    }
}

```

## 12.32 RescaleImage.cs

```

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=====*/
/*

```

```

* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
* $ mono bin/DecompressImage.exe gdcmData/012345.002.050.dcm rescaled.dcm
*/
using System;
using gdcm;
public class DecompressImage
{
    public static int Main(string[] args)
    {
        string file1 = args[0];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        bool ret = reader.Read();
        if( !ret )
        {
            return 1;
        }
        Image image = reader.GetImage();
        PixelFormat pixeltype = image.GetPixelFormat();
        Rescaler r = new Rescaler();
        r.SetIntercept( 0 );
        r.SetSlope( 1.2 );
        r.SetPixelFormat( pixeltype );
        PixelFormat outputpt = new PixelFormat( r.ComputeInterceptSlopePixelFormat() );
        System.Console.WriteLine( "pixeltype" );
        System.Console.WriteLine( pixeltype.ToString() );
        System.Console.WriteLine( "outputpt" );
        System.Console.WriteLine( outputpt.ToString() );
        uint len = image.GetBufferLength();
        short[] input = new short[ len / 2 ]; // sizeof(short) == 2
        image.GetArray( input );
        double[] output = new double[ len / 2 ];
        r.Rescale( output, input, len );
        // First Pixel is:
        System.Console.WriteLine( "Input:" );
        System.Console.WriteLine( input[0] );
        System.Console.WriteLine( "Output:" );
        System.Console.WriteLine( output[0] );
        return 0;
    }
}

```

## 12.33 SendFileSCU.cs

```

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=====*/
/*
* Usage:
* $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm-gcc/bin
* $ mono bin/SendFileSCU.exe server port input.dcm
*/
using System;
using gdcm;
public class SendFileSCU
{
    public static int Main(string[] args)
    {
        string server = args[0];
        ushort port = ushort.Parse(args[1]);
        string filename = args[2];
        bool b = CompositeNetworkFunctions.CEcho( server, port );
        if( !b ) return 1;
        FilenamesType files = new FilenamesType();
        files.Add( filename );
        b = CompositeNetworkFunctions.CStore( server, port, files );
    }
}

```

```

    if( !b ) return 1;
    return 0;
}

```

## 12.34 SimplePrintPatientName.cs

```

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=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Perso/gdcm/debug-gcc/bin
 * $ mono bin/SimplePrintPatientName.exe gdcmData/012345.002.050.dcm
 */
/*
This example was provided by Jonathan Morra /jonmorra gmail com/
on the gdcm mailing list (Fri, 28 May 2010)
*/
using System;
using gdcm;
namespace GDCMTest
{
    class SimplePrintPatientName
    {
        static int Main(string[] args)
        {
            if (args.Length != 1)
            {
                Console.WriteLine("This program prints the patient name of a dicom file with gdcm");
                Console.WriteLine("Usage:  [input.dcm]");
                return 1;
            }
            gdcm.Reader reader = new gdcm.Reader();
            reader.SetFileName(args[0]);
            bool ret = reader.Read();
            //TagSetType tst = new TagSetType();
            //tst.Add( new Tag(0x7fe0,0x10) );
            //bool ret = reader.ReadUpToTag( new Tag(0x88,0x200), tst );
            if( !ret )
            {
                return 1;
            }
            gdcm.File file = reader.GetFile();
            gdcm.StringFilter filter = new gdcm.StringFilter();
            filter.SetFile(file);
            string value = filter.ToString(new gdcm.Tag(0x0010, 0x0010));
            Console.WriteLine("Patient Name:  " + value);
            return 0;
        }
    }
}

```

## 12.35 SortImage2.cs

```

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```

=====*/
/*
 * Usage:
 * $ export LD_LIBRARY_PATH=$HOME/Projects/gdcm/debug-gcc/bin
 * $ mono bin/SortImage.exe gdcmData/012345.002.050.dcm out.dcm
 */
using System;
using gdcm;
public class SortImage2
{
    bool mysort(DataSet ds1, DataSet ds2)
    {
        return false;
    }
    public static int Main(string[] args)
    {
        Sorter sorter = new Sorter();
        sorter.SetSortFunction( mysort );
        return 0;
    }
}

```

## 12.36 CStoreQtProgress.cxx

```

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=====*/
/*
 * This small example show how one can use the virtual function
 * mechanism of the SimpleSubjectWatcher class to redirect progress
 * report to a custom Qt classes
 *
 * http://doc.qt.nokia.com/latest/qprogressdialog.html
 *
 * Usage:
 * CStoreQtProgress dicom.example.com 11112 gdcmData/MR_Spectroscopy_SIEMENS_OF.dcm
 */
#include "gdcmServiceClassUser.h"
#include "gdcmSimpleSubjectWatcher.h"
#include "gdcmProgressEvent.h"
#include "gdcmDirectory.h"
#include "gdcmPresentationContextGenerator.h"
#include <QApplication>
#include <QProgressDialog>
#include <QVBoxLayout>
namespace gdcm {
/*
 * This class is a little more complicated than what this example demonstrate
 * This watcher is capable of handling nested progress. Since the Progress
 * grows from [0 to 1] on a per file basis and we only have one instance of a
 * watcher per association, we need some calculation to compute the global
 * (total) progress
 * In fact we simply divide the per-file progress by the number of files.
 *
 * This QtWatcher class will then update the progress bar according to the
 * progress.
 */
class MyQtWatcher : public SimpleSubjectWatcher
{
    size_t nfiles;
    double progress;
    size_t index;

```

```

double refprogress;
QWidget* win;
QProgressDialog* qtprogress;
public:
MyQtWatcher(Subject * s, const char *comment = "", QWidget *w = NULL, QProgressDialog* p = NULL, size_t n =
1):
    SimpleSubjectWatcher(s,comment),nfiles(n),progress(0),index(0),refprogress(0),win(w),qtprogress(p){}
void ShowIteration()
{
    index++;
    assert( index <= nfiles );
    // update refprogress (we are moving to the next file)
    refprogress = progress;
}
void ShowProgress(Subject *, const Event &evt)
{
    // Retrieve the ProgressEvent:
    const ProgressEvent &pe = dynamic_cast<const ProgressEvent&>(evt);
    // compute global progress:
    progress = refprogress + (1. / (double)nfiles ) * pe.GetProgress();
    // Print Global and local progress to stdout:
    std::cout << "Global Progress: " << progress << " per file progress " << pe.GetProgress() << std::endl;
    //set progress value in the QtProgress bar
    int i = (int)(progress * 100 + 0.5); // round to next int
    qtprogress->setValue(i);
    win->show();
}
virtual void ShowDataSet(Subject *caller, const Event &evt)
{
    (void)caller;
    (void)evt;
}
};
} // end namespace gdcmm
int main(int argc, char *argv[])
{
    if( argc < 4 )
    {
        std::cerr << argv[0] << " remote_server port filename" << std::endl;
        return 1;
    }
    QApplication a(argc, argv);
    std::ostream error_log;
    gdcmm::Trace::SetErrorStream( error_log );
    const char *remote = argv[1];
    int portno = atoi(argv[2]);
    const char *filename = argv[3];
    QVBoxLayout* layout = new QVBoxLayout;
    QWidget* win = new QWidget;
    QProgressDialog* progress = new QProgressDialog("Sending data...", "Cancel", 0, 100);
    progress->setWindowModality(Qt::WindowModal);
    layout->addWidget( progress,Qt::AlignCenter);
    win->setLayout( layout);
    gdcmm::SmartPointer<gdcmm::ServiceClassUser> scup = new gdcmm::ServiceClassUser;
    gdcmm::ServiceClassUser &scu = *scup;
    //gdcmm::SimpleSubjectWatcher w( &scu, "TestServiceClassUser" );
    // let's use a more complicated progress reported in this example
    gdcmm::MyQtWatcher w( &scu, "QtWatcher", win, progress );
    scu.SetHostname( remote );
    scu.SetPort( (uint16_t)portno );
    scu.SetTimeout( 1000 );
    scu.SetCalledAETitle( "GDCM_STORE" );
    if( !scu.InitializeConnection() )
    {
        std::cerr << "Could not InitializeConnection" << std::endl;
        return 1;
    }
    gdcmm::Directory::FileNamesType filenames;
    filenames.push_back( filename );
    // setup the PC(s) based on the filenames:
    gdcmm::PresentationContextGenerator generator;
    if( !generator.GenerateFromFileNames(filenames) )
    {
        std::cerr << "Could not GenerateFromFileNames" << std::endl;
        return 1;
    }
    // Setup PresentationContext(s)
    scu.SetPresentationContexts( generator.GetPresentationContexts() );
    // Start ASSOCIATION
    if( !scu.StartAssociation() )
    {

```

```

        std::cerr << "Could not Start" << std::endl;
        return 1;
    }
    // Send C-STORE
    if( !scu.SendStore( filename ) )
    {
        std::cerr << "Could not Store" << std::endl;
        std::cerr << "Error log is:" << std::endl;
        std::cerr << error_log.str() << std::endl;
        return 1;
    }
    // Stop ASSOCIATION
    if( !scu.StopAssociation() )
    {
        std::cerr << "Could not Stop" << std::endl;
        return 1;
    }
    win->show();
    return a.exec();
}

```

## 12.37 ChangePrivateTags.cxx

/\*=====

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=====\*/

```

#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmPrivateTag.h"
int main(int argc, char* argv[] )
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " path/to/05148044-mr-siemens-avanto-syngo.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if ( ! reader.Read() )
    {
        return 1;
    }
    // (0029,0010) LO [SIEMENS CSA HEADER] # 18,1 Private Creator
    // (0029,0011) LO [SIEMENS MEDCOM HEADER ] # 22,1 Private Creator
    // (0029,0012) LO [SIEMENS MEDCOM HEADER2] # 22,1 Private Creator
    // [...]
    // (0029,1018) CS [MR] # 2,1 CSA Series Header Type
    // (0029,1134) CS [DB TO DICOM ] # 12,1 PMTF Information 4
    // (0029,1260) LO [com ] # 4,1 Series Workflow Status
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    // Declare private tag we need to find:
    gdcm::PrivateTag pt1( 0x29,0x18, "SIEMENS CSA HEADER" );
    gdcm::PrivateTag pt2( 0x29,0x34, "SIEMENS MEDCOM HEADER" );
    gdcm::PrivateTag pt3( 0x29,0x60, "SIEMENS MEDCOM HEADER2" );
    const char str1[] = "GDCM was here 3!";
    if( !ds.FindDataElement( pt1 ) ) return 1;
    gdcm::DataElement de1 = ds.GetDataElement( pt1 ); // Convert Private tag, into actual DataElement
    std::cout << de1 << std::endl;
    de1.SetByteValue( str1, (uint32_t)strlen(str1) );
    ds.Replace( de1 );
    const char str2[] = "GDCM was here 2!";
    if( !ds.FindDataElement( pt2 ) ) return 1;
    gdcm::DataElement de2 = ds.GetDataElement( pt2 );
    std::cout << de2 << std::endl;
}

```



```

de2.SetByteValue( str2, (uint32_t)strlen(str2) );
ds.Replace( de2 );
const char str3[] = "GDCM was here 3!";
if( !ds.FindDataElement( pt3 ) ) return 1;
gdcm::DataElement de3 = ds.GetDataElement( pt3 );
std::cout << de3 << std::endl;
de3.SetByteValue( str3, (uint32_t)strlen(str3) );
ds.Replace( de3 );
gdcm::Writer writer;
writer.SetFile( file );
writer.SetFileName( outfilename );
if ( !writer.Write() )
{
    return 1;
}
return 0;
}

```

## 12.38 ChangeSequenceUltrasound.cxx

```

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=====*/

```

```

#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmSmartPointer.h"
#include "gdcmDataSetHelper.h"
/*
./ChangeSequenceUltrasound gdcmData/D_CLUNIE_CT1_J2KI.dcm myoutput.dcm

This is the exact C++ translation of the original python example: ManipulateSequence.py
*/
int main(int argc, char* argv[] )
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if ( ! reader.Read() )
    {
        return 1;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    gdcm::Tag tsis(0x0008,0x2112); // SourceImageSequence
    if ( ds.FindDataElement( tsis ) )
    {
        const gdcm::DataElement &sis = ds.GetDataElement( tsis );
        gdcm::SmartPointer<gdcm::SequenceOfItems> sqsis = sis.GetValueAsSQ();
        if ( sqsis && sqsis->GetNumberOfItems() )
        {
            gdcm::Item &item1 = sqsis->GetItem(1);
            gdcm::DataSet &nestedds = item1.GetNestedDataSet();
            gdcm::Tag tprcs(0x0040,0xa170); // PurposeOfReferenceCodeSequence
            if( nestedds.FindDataElement( tprcs ) )
            {
                const gdcm::DataElement &prcs = nestedds.GetDataElement( tprcs );
                gdcm::SmartPointer<gdcm::SequenceOfItems> sqprcs = prcs.GetValueAsSQ();
                if ( sqprcs && sqprcs->GetNumberOfItems() )
                {
                    gdcm::Item &item2 = sqprcs->GetItem(1);
                    gdcm::DataSet &nestedds2 = item2.GetNestedDataSet();

```

```

        // (0008,0104) LO [Uncompressed predecessor]                # 24, 1 CodeMeaning
        gdcmm::Tag tcm(0x0008,0x0104);
        if( nestedds2.FindDataElement( tcm ) )
        {
            gdcmm::DataElement cm = nestedds2.GetDataElement( tcm );
            std::string mystr = "GDCM was here";
            cm.SetByteValue( mystr.c_str(), (uint32_t)mystr.size() );
            nestedds2.Replace( cm );
        }
    }
}

gdcmm::Writer writer;
writer.SetFile( file );
writer.SetFileName( outfilename );
if ( !writer.Write() )
{
    return 1;
}
return 0;
}

```

## 12.39 CheckBigEndianBug.cxx

```

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=====*/
/*
 * WARNING: This is a dev tool, do not use !
 *
 * Usage:  after a gdcmmconv, you would like to know if the conversion process is acceptable
 * sometime a vbindiff is acceptable, sometime it is not.  In the case of the famous Philips
 * Little/Big Endian Explicit Transfer Syntax it is not easy to compare two files.  However
 * this only impact byte ordering, thus we can compute byte-independant information to still
 * compare the files.
 */
#include "gdcmmImageReader.h"
#include "gdcmmImage.h"
#include "gdcmmWriter.h"
#include "gdcmmAttribute.h"
#include "gdcmmSystem.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input1.dcm input2.dcm" << std::endl;
        return 1;
    }
    const char *filename1 = argv[1];
    const char *filename2 = argv[2];
    gdcmm::ImageReader reader1;
    reader1.SetFileName( filename1 );
    if( !reader1.Read() )
    {
        std::cerr << "Could not read:  " << filename1 << std::endl;
        return 1;
    }
    gdcmm::ImageReader reader2;
    reader2.SetFileName( filename2 );
    if( !reader2.Read() )
    {
        std::cerr << "Could not read:  " << filename2 << std::endl;
        return 1;
    }
}

```

```

// TODO: need a DataSet== operator implementation
std::cout << "Both files can be read and looks like DICOM" << std::endl;
size_t s1 = gdcm::System::FileSize(filename1);
size_t s2 = gdcm::System::FileSize(filename2);
if( s1 != s2 )
{
    std::cout << "Size mismatch: " << s1 << " != " << s2 << std::endl;
    return 1;
}
else
{
    std::cout << "Size match: " << s1 << " = " << s2 << std::endl;
}
std::ifstream is1( filename1, std::ios::binary );
char *buffer1 = new char[s1];
is1.read(buffer1, s1);
std::ifstream is2( filename2, std::ios::binary );
char *buffer2 = new char[s2];
is2.read(buffer2, s2);
assert( s1 == s2 );
if( memcmp(buffer1, buffer2, s1 ) == 0 )
{
    std::cout << "memcmp succeed ! File are bit identical" << std::endl;
}
else
{
    std::cout << "memcmp failed!" << std::endl;
}
// Hum...memcmp failed, for big endian/ little endian inversion the histogram of bytes
// should still be the same. So let's compute it
// buffer2[0] = 1; // let's make the test fail
std::multiset<char> set1( buffer1, buffer1 + s1 );
std::multiset<char> set2( buffer2, buffer2 + s2 );
if( set1 == set2 )
{
    std::cout << "set1 == set2. Byte histogram seems valid" << std::endl;
}
else
{
    std::cout << "set1 != set2" << std::endl;
}
delete[] buffer1;
delete[] buffer2;
return 0;
}

```

## 12.40 ClinicalTrialAnnotate.cxx

```

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=====*/
/*
* Dummy implementation of C.7.1.3 Clinical Trial Subject Module
*
* Usage:
* ClinicalTrialAnnotate gdcmData/012345.002.050.dcm out.dcm
*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAnonymizer.h"
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
}

```

```

const char *filename = argv[1];
const char *outfilename = argv[2];
gdcm::Reader reader;
reader.SetFileName( filename );
if( !reader.Read() )
{
    std::cerr << "Could not read: " << filename << std::endl;
    return 1;
}
// The output of gdcm::Reader is a gdcm::File
//gdcm::File &file = reader.GetFile();
// the dataset is the the set of element we are interested in:
//gdcm::DataSet &ds = file.GetDataSet();
gdcm::Anonymizer ano;
ano.SetFile( reader.GetFile() );
ano.RemoveGroupLength();
ano.RemovePrivateTags();
// PS 3.3 - 2008
// C.7.1.3 Clinical Trial Subject Module
// <entry group="0012" element="0010" vr="LO" vm="1" name="Clinical Trial Sponsor Name"/>
ano.Replace( gdcm::Tag(0x12,0x10), "BigCompany name" );
// <entry group="0012" element="0020" vr="LO" vm="1" name="Clinical Trial Protocol ID"/>
ano.Replace( gdcm::Tag(0x12,0x20), "My Clinical Trial Protocol ID" );
// <entry group="0012" element="0021" vr="LO" vm="1" name="Clinical Trial Protocol Name"/>
ano.Replace( gdcm::Tag(0x12,0x21), "My Clinical Trial Protocol Name" );
// <entry group="0012" element="0030" vr="LO" vm="1" name="Clinical Trial Site ID"/>
ano.Replace( gdcm::Tag(0x12,0x30), "My Clinical Trial Site ID" );
// <entry group="0012" element="0031" vr="LO" vm="1" name="Clinical Trial Site Name"/>
ano.Replace( gdcm::Tag(0x12,0x31), "My Clinical Trial Site Name" );
// <entry group="0012" element="0040" vr="LO" vm="1" name="Clinical Trial Subject ID"/>
ano.Replace( gdcm::Tag(0x12,0x40), "My Clinical Trial Subject ID" );
// <entry group="0012" element="0042" vr="LO" vm="1" name="Clinical Trial Subject Reading ID"/>
ano.Replace( gdcm::Tag(0x12,0x42), "My Clinical Trial Subject Reading ID" );
gdcm::Writer writer;
writer.SetFile( reader.GetFile() );
writer.SetFileName( outfile );
if( !writer.Write() )
{
    return 1;
}
return 0;
}

```

## 12.41 CompressImage.cxx

```

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=====*/
/*
 *
 */
#include "gdcmImageReader.h"
#include "gdcmImage.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
#include "gdcmImageChangeTransferSyntax.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];

```

```

const char *outfilename = argv[2];
gdcm::ImageReader reader;
reader.SetFileName( filename );
if( !reader.Read() )
{
    std::cerr << "Could not read: " << filename << std::endl;
    return 1;
}
// The output of gdcm::Reader is a gdcm::File
//gdcm::File &file = reader.GetFile();
// the dataset is the the set of element we are interested in:
//gdcm::DataSet &ds = file.GetDataSet();
gdcm::Image &image = reader.GetImage();
// image.SetSpacing(0, 0.1);
// image.SetSpacing(1, 0.2);
image.Print( std::cout );
gdcm::ImageChangeTransferSyntax change;
change.SetTransferSyntax( gdcm::TransferSyntax::JPEG2000Lossless );
change.SetTransferSyntax( gdcm::TransferSyntax::JPEGLosslessProcess14_1 );
//change.SetTransferSyntax( gdcm::TransferSyntax::JPEGBaselineProcess1 );
//change.SetTransferSyntax( image.GetTransferSyntax() );
change.SetInput( image );
bool b = change.Change();
if( !b )
{
    std::cerr << "Could not change the Transfer Syntax" << std::endl;
    return 1;
}
//std::ofstream out( outfile, std::ios::binary );
//image.GetBuffer2(out);
//out.close();
gdcm::ImageWriter writer;
writer.SetImage( change.GetOutput() );
writer.SetFile( reader.GetFile() );
writer.SetFileName( outfile );
if( !writer.Write() )
{
    return 1;
}
return 0;
}

```

## 12.42 ConvertToQImage.cxx

```

/*=====

```

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```

=====*/

```

```

/*
 * This example shows how to setup the pipeline from a gdcm::ImageReader into a
 * Qt QImage data structure.
 * It only handles 2D image.
 *
 * Ref:
 * http://doc.trolltech.com/4.5/qimage.html
 *
 * Usage:
 * ConvertToQImage gdcmData/012345.002.050.dcm output.png
 *
 * Thanks:
 * Sylvain ADAM (sylvain51 hotmail com) for contributing this example
 */
#include "gdcmImageReader.h"
#include <QImage>
#include <QImageWriter>
bool ConvertToFormat_RGB888(gdcm::Image const & gimage, char *buffer, QImage* &imageQt)
{
    const unsigned int* dimension = gimage.GetDimensions();

```

```

unsigned int dimX = dimension[0];
unsigned int dimY = dimension[1];
gimage.GetBuffer(buffer);
// Let's start with the easy case:
if( gimage.GetPhotometricInterpretation() == gdcm::PhotometricInterpretation::RGB )
{
    if( gimage.GetPixelFormat() != gdcm::PixelFormat::UINT8 )
    {
        return false;
    }
    unsigned char *ubuffer = (unsigned char*)buffer;
    // QImage::Format_RGB888 13 The image is stored using a 24-bit RGB format (8-8-8).
    imageQt = new QImage((unsigned char *)ubuffer, dimX, dimY, 3*dimX, QImage::Format_RGB888);
}
else if( gimage.GetPhotometricInterpretation() == gdcm::PhotometricInterpretation::MONOCHROME2 )
{
    if( gimage.GetPixelFormat() == gdcm::PixelFormat::UINT8 )
    {
        // We need to copy each individual 8bits into R / G and B:
        unsigned char *ubuffer = new unsigned char[dimX*dimY*3];
        unsigned char *pubuffer = ubuffer;
        for(unsigned int i = 0; i < dimX*dimY; i++)
        {
            *pubuffer++ = *buffer;
            *pubuffer++ = *buffer;
            *pubuffer++ = *buffer++;
        }
        imageQt = new QImage(ubuffer, dimX, dimY, QImage::Format_RGB888);
    }
    else if( gimage.GetPixelFormat() == gdcm::PixelFormat::INT16 )
    {
        // We need to copy each individual 16bits into R / G and B (truncate value)
        short *buffer16 = (short*)buffer;
        unsigned char *ubuffer = new unsigned char[dimX*dimY*3];
        unsigned char *pubuffer = ubuffer;
        for(unsigned int i = 0; i < dimX*dimY; i++)
        {
            // Scalar Range of gdcmData/012345.002.050.dcm is [0,192], we could simply do:
            // *pubuffer++ = *buffer16;
            // *pubuffer++ = *buffer16;
            // *pubuffer++ = *buffer16;
            // instead do it right:
            *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
            *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
            *pubuffer++ = (unsigned char)std::min(255, (32768 + *buffer16) / 255);
            buffer16++;
        }
        imageQt = new QImage(ubuffer, dimX, dimY, QImage::Format_RGB888);
    }
    else
    {
        std::cerr << "Pixel Format is: " << gimage.GetPixelFormat() << std::endl;
        return false;
    }
}
else
{
    std::cerr << "Unhandled PhotometricInterpretation: " << gimage.GetPhotometricInterpretation() << std::endl;
    return false;
}
return true;
}
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::ImageReader ir;
    ir.SetFileName( filename );
    if(!ir.Read())
    {
        //Read failed
        return 1;
    }
    std::cout<<"Getting image from ImageReader..."<<std::endl;
    const gdcm::Image &gimage = ir.GetImage();
    std::vector<char> vbuffer;
    vbuffer.resize( gimage.GetBufferLength() );

```

```

char *buffer = &vbuffer[0];
QImage *imageQt = NULL;
if( !ConvertToFormat_RGB888( gimage, buffer, imageQt ) )
{
    return 1;
}
QImageWriter writer;
writer.setFormat("png");
writer.setFileName( outfilename );
if( !writer.write( *imageQt ) )
{
    return 1;
}
return 0;
}

```

## 12.43 CreateARGBImage.cxx

```

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=====*/
/*
 * http://www.w3.org/Graphics/PNG/inline-alpha.html
 * alphatest.png: PNG image data, 380 x 287, 8-bit/color RGBA, non-interlaced
 *
 * $ convert alphatest.png alphatest.rgba
 */
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmSystem.h"
#include "gdcmImageWriter.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.rgba output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    size_t len = gdcm::System::FileSize(filename);
    std::ifstream is(filename, std::ios::binary);
    char * buf = new char[len];
    is.read(buf, len);
    gdcm::ImageWriter writer;
    gdcm::Image &image = writer.GetImage();
    image.SetNumberOfDimensions( 2 );
    unsigned int dims[3] = {};
    dims[0] = 380;
    dims[1] = 287;
    image.SetDimensions( dims );
    gdcm::PixelFormat pf = gdcm::PixelFormat::UINT8;
    pf.SetSamplesPerPixel( 4 );
    image.SetPixelFormat( pf );
    gdcm::PhotometricInterpretation pi = gdcm::PhotometricInterpretation::ARGB;
    image.SetPhotometricInterpretation( pi );
    image.SetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
    gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
    pixeldata.SetByteValue( buf, (uint32_t)len );
    image.SetDataElement( pixeldata );
    writer.SetFileName( outfilename );
    if( !writer.Write() )
    {
        return 1;
    }
}

```

```

delete[] buf;
return 0;
}

```

## 12.44 CreateCMYKImage.cxx

```

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=====*/
/*
 * http://www.w3.org/Graphics/PNG/inline-alpha.html
 * alphatest.png:  PNG image data, 380 x 287, 8-bit/color RGBA, non-interlaced
 *
 * $ convert alphatest.png alphatest.cmyk
 */
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmSystem.h"
#include "gdcmImageWriter.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.cmyk output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    size_t len = gdcm::System::FileSize(filename);
    std::ifstream is(filename, std::ios::binary);
    char * buf = new char[len];
    is.read(buf, len);
    gdcm::ImageWriter writer;
    gdcm::Image &image = writer.GetImage();
    image.SetNumberOfDimensions( 2 );
    unsigned int dims[3] = {};
    dims[0] = 380;
    dims[1] = 287;
    image.SetDimensions( dims );
    gdcm::PixelFormat pf = gdcm::PixelFormat::UINT8;
    pf.SetSamplesPerPixel( 4 );
    image.SetPixelFormat( pf );
    gdcm::PhotometricInterpretation pi = gdcm::PhotometricInterpretation::CMYK;
    image.SetPhotometricInterpretation( pi );
    image.SetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
    gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
    pixeldata.SetByteValue( buf, (uint32_t)len );
    image.SetDataElement( pixeldata );
    writer.SetFileName( outfile );
    if( !writer.Write() )
    {
        return 1;
    }
    delete[] buf;
    return 0;
}

```

## 12.45 CreateJPIPDataSet.cxx

```

/*=====

```



Program: GDCM (Grassroots DICOM). A DICOM library

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```

=====*/
/*
 * This example was created during the GSOC 2011 project for
 * JPIP
 */
#include "gdcmAnonymizer.h"
#include "gdcmWriter.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmSystem.h"
#include "gdcmAttribute.h"
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " output.dcm" << std::endl;
        return 1;
    }
    const char *outfilename = argv[1];
    gdcm::Writer w;
    gdcm::File &file = w.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    //w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfile );
    file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::JPIPReferenced );
    gdcm::Anonymizer anon;
    anon.SetFile( file );
    gdcm::MediaStorage ms = gdcm::MediaStorage::SecondaryCaptureImageStorage;
    gdcm::UIDGenerator gen;
    anon.Replace( gdcm::Tag(0x0008,0x16), ms.GetString() );
    std::cout << ms.GetString() << std::endl;
    anon.Replace( gdcm::Tag(0x0008,0x18), gen.Generate() );
    //
    anon.Replace( gdcm::Tag(0x0010,0x10), "JPIP^EXAMPLE" );
    anon.Replace( gdcm::Tag(0x0010,0x20), "012345" );
    anon.Empty( gdcm::Tag(0x0010,0x30) );
    anon.Empty( gdcm::Tag(0x0010,0x40) );
    anon.Empty( gdcm::Tag(0x0008,0x20) );
    anon.Empty( gdcm::Tag(0x0008,0x30) );
    anon.Empty( gdcm::Tag(0x0008,0x90) );
    anon.Empty( gdcm::Tag(0x0020,0x10) );
    anon.Empty( gdcm::Tag(0x0020,0x11) );
    anon.Empty( gdcm::Tag(0x0008,0x50) );
    anon.Empty( gdcm::Tag(0x0020,0x0013) );
    anon.Replace( gdcm::Tag(0x0020,0xd), gen.Generate() );
    anon.Replace( gdcm::Tag(0x0020,0xe), gen.Generate() );
    anon.Replace( gdcm::Tag(0x0008,0x64), "WSD " );
    anon.Replace( gdcm::Tag(0x0008,0x60), "OT" );
    gdcm::Attribute<0x0028,0x7FE0> at;
    at.SetValue( "http://dicom.example.com/jpipserver.cgi?target=img.jp2" );
    ds.Insert( at.GetAsDataElement() );
    // Need to retrieve the PixelFormat information from the given file
    if (!w.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }
    return 0;
}

```

## 12.46 DeriveSeries.cxx

```

/*=====

```

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```

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFileDerivation.h"
#include "gdcmUIDGenerator.h"
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char * ref = argv[1];
    const char * in = argv[2];
    gdcm::Reader r1;
    r1.SetFileName( ref );
    if( !r1.Read() ) return 1;
    gdcm::Reader r2;
    r2.SetFileName( in );
    if( !r2.Read() ) return 1;
    // Fix Spatial info:
    gdcm::DataSet & ds1 = r1.GetFile().GetDataSet();
    gdcm::File & file2 = r2.GetFile();
    gdcm::DataSet & ds2 = file2.GetDataSet();
    //gdcm::Attribute<0x8,0x8> img_type = { "ORIGINAL", "PRIMARY" };
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0008,0x0008) ) );
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0032) ) );
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0037) ) );
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0088) ) ); // Spacing between slices
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x0013) ) ); // Instance Number
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x5100) ) ); // Patient Position
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0050) ) ); // Slice Thickness
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0008,0x0070) ) ); // Manufacturer
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0018,0x0081) ) ); // Echo Time
    ds2.Replace( ds1.GetDataElement( gdcm::Tag(0x0020,0x1041) ) ); // Slice Location
    gdcm::Attribute<0x8,0x16> sopclassuid;
    sopclassuid.SetFromDataSet( ds1 );
    gdcm::Attribute<0x8,0x18> sopinstanceuid;
    sopinstanceuid.SetFromDataSet( ds1 );
    // Step 2: DERIVED object
    gdcm::FileDerivation fd;
    fd.AddReference( sopclassuid.GetValue(), sopinstanceuid.GetValue() );
    // http://dicom.nema.org/MEDICAL/dicom/current/output/chtml/part16/chapter_D.html#DCM_121321
    // CID 7202 "Source Image Purposes of Reference"
    // DCM 121321 "Mask image for image processing operation"
    fd.SetPurposeOfReferenceCodeSequenceCodeValue( 121321 );
    // CID 7203 "Image Derivation"
    // DCM 113047 "Pixel by pixel mask"
    fd.SetDerivationCodeSequenceCodeValue( 113047 );
    fd.SetFile( file2 );
    // If all Code Value are ok the filter will execute properly
    if( !fd.Derive() )
    {
        std::cerr << "Sorry could not derive using input info" << std::endl;
        return 1;
    }
    gdcm::Writer w;
    w.SetFile( r2.GetFile() );
    w.SetFileName( "derived.dcm" );
    if( !w.Write() )
    {
        return 1;
    }
    return 0;
}

```

## 12.47 DiffFile.cxx

```

/*=====

```

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```

=====*/
#include "gdcmReader.h"
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input1.dcm input2.dcm" << std::endl;
        return 1;
    }
    const char *filename1 = argv[1];
    const char *filename2 = argv[2];
    gdcm::Reader reader1;
    reader1.SetFileName( filename1 );
    if( !reader1.Read() )
    {
        return 1;
    }
    gdcm::Reader reader2;
    reader2.SetFileName( filename2 );
    if( !reader2.Read() )
    {
        return 1;
    }
    const gdcm::File &file1 = reader1.GetFile();
    const gdcm::File &file2 = reader2.GetFile();
    const gdcm::DataSet &ds1 = file1.GetDataSet();
    const gdcm::DataSet &ds2 = file2.GetDataSet();
    gdcm::DataSet::ConstIterator it1 = ds1.Begin();
    gdcm::DataSet::ConstIterator it2 = ds2.Begin();
    const gdcm::DataElement &de1 = *it1;
    const gdcm::DataElement &de2 = *it2;
    if( de1 == de2 )
    {
    }
    while( it1 != ds1.End() && it2 != ds2.End() && *it1 == *it2 )
    {
        ++it1;
        ++it2;
    }
    if( it1 != ds1.End() || it2 != ds2.End() )
    {
        std::cerr << "Problem with:" << std::endl;
        if( it1 != ds1.End() )
        {
            std::cerr << "ds1: " << *it1 << std::endl;
        }
        if( it2 != ds2.End() )
        {
            std::cerr << "ds2: " << *it2 << std::endl;
        }
        return 1;
    }
    return 0;
}

```

## 12.48 DiscriminateVolume.cxx

```

/*=====

```

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```

=====*/
#include "gdcmScanner.h"
#include "gdcmTesting.h"
#include "gdcmIPPSorter.h"
#include "gdcmDirectionCosines.h"
#include <cmath>
/*
 * The following example is a basic sorted which should work in generic cases.
 * It sort files based on:
 * Study Instance UID
 *   Series Instance UID
 *     Frame of Reference UID
 *       Image Orientation (Patient)
 *         Image Position (Patient) (Sorting based on IPP + IOP)
 */
namespace gdcm {
    const Tag t1(0x0020,0x000d); // Study Instance UID
    const Tag t2(0x0020,0x000e); // Series Instance UID
    const Tag t3(0x0020,0x0052); // Frame of Reference UID
    const Tag t4(0x0020,0x0037); // Image Orientation (Patient)
    class DiscriminateVolume
    {
    private:
        std::vector< Directory::FileNamesType > SortedFiles;
        std::vector< Directory::FileNamesType > UnsortedFiles;
        Directory::FileNamesType GetAllFileNamesFromTagToValue(
            Scanner const & s, Directory::FileNamesType const & filesubset, Tag const & t, const char *valueref)
        {
            Directory::FileNamesType theReturn;
            if( valueref )
            {
                size_t len = strlen( valueref );
                Directory::FileNamesType::const_iterator file = filesubset.begin();
                for(; file != filesubset.end(); ++file)
                {
                    const char *filename = file->c_str();
                    const char * value = s.GetValue(filename, t);
                    if( value && strncmp(value, valueref, len ) == 0 )
                    {
                        theReturn.push_back( filename );
                    }
                }
            }
            return theReturn;
        }
    }
    void ProcessAIOP(Scanner const & , Directory::FileNamesType const & subset, const char *iopval)
    {
        std::cout << "IOP: " << iopval << std::endl;
        IPPSorter ipp;
        ipp.SetComputeZSpacing( true );
        ipp.SetZSpacingTolerance( 1e-3 ); // ??
        bool b = ipp.Sort( subset );
        if( !b )
        {
            // If you reach here this means you need one more parameter to discriminiat this
            // series. Eg. T1 / T2 intertwined. Multiple Echo (0018,0081)
            std::cerr << "Failed to sort: " << subset.begin()->c_str() << std::endl;
            for(
                Directory::FileNamesType::const_iterator file = subset.begin();
                file != subset.end(); ++file)
            {
                std::cerr << *file << std::endl;
            }
            UnsortedFiles.push_back( subset );
            return ;
        }
        ipp.Print( std::cout );
        SortedFiles.push_back( ipp.GetFileNames() );
    }
    void ProcessAFrameOfRef(Scanner const & s, Directory::FileNamesType const & subset, const char * frameuid)
    {
        // In this subset of files (belonging to same series), let's find those
        // belonging to the same Frame ref UID:
        Directory::FileNamesType files = GetAllFileNamesFromTagToValue(
            s, subset, t3, frameuid);
        std::set< std::string > iopset;
        for(
            Directory::FileNamesType::const_iterator file = files.begin();

```

```

    file != files.end(); ++file)
    {
        //std::cout << *file << std::endl;
        const char * value = s.GetValue(file->c_str(), gdcm::t4 );
        assert( value );
        iopset.insert( value );
    }
    size_t n = iopset.size();
    if ( n == 0 )
    {
        assert( files.empty() );
        return;
    }
    std::cout << "Frame of Ref: " << frameuid << std::endl;
    if ( n == 1 )
    {
        ProcessAIOP(s, files, iopset.begin()->c_str() );
    }
    else
    {
        const char *f = files.begin()->c_str();
        std::cerr << "More than one IOP: " << f << std::endl;
        // Make sure that there is actually 'n' different IOP
        gdcm::DirectionCosines ref;
        gdcm::DirectionCosines dc;
        for(
            std::set< std::string >::const_iterator it = iopset.begin();
            it != iopset.end(); ++it )
        {
            ref.SetFromString( it->c_str() );
            for(
                Directory::FileNamesType::const_iterator file = files.begin();
                file != files.end(); ++file )
            {
                std::string value = s.GetValue(file->c_str(), gdcm::t4 );
                if( value != it->c_str() )
                {
                    dc.SetFromString( value.c_str() );
                    const double crossdot = ref.CrossDot(dc);
                    const double eps = std::fabs( 1. - crossdot );
                    if( eps < 1e-6 )
                    {
                        std::cerr << "Problem with IOP discrimination: " << file->c_str()
                            << " " << it->c_str() << std::endl;
                        return;
                    }
                }
            }
        }
        // If we reach here this means there is actually 'n' different IOP
        for(
            std::set< std::string >::const_iterator it = iopset.begin();
            it != iopset.end(); ++it )
        {
            const char *iopvalue = it->c_str();
            Directory::FileNamesType iopfiles = GetAllFileNamesFromTagToValue(
                s, files, t4, iopvalue );
            ProcessAIOP(s, iopfiles, iopvalue );
        }
    }
}

void ProcessASeries(Scanner const & s, const char * seriesuid)
{
    std::cout << "Series: " << seriesuid << std::endl;
    // let's find all files belonging to this series:
    Directory::FileNamesType seriesfiles = GetAllFileNamesFromTagToValue(
        s, s.GetFileNames(), t2, seriesuid);
    gdcm::Scanner::ValuesType vt3 = s.GetValues(t3);
    for(
        gdcm::Scanner::ValuesType::const_iterator it = vt3.begin();
        it != vt3.end(); ++it )
    {
        ProcessAFrameOfRef(s, seriesfiles, it->c_str());
    }
}

void ProcessAStudy(Scanner const & s, const char * studyuid)
{
    std::cout << "Study: " << studyuid << std::endl;
    gdcm::Scanner::ValuesType vt2 = s.GetValues(t2);
    for(
        gdcm::Scanner::ValuesType::const_iterator it = vt2.begin()

```

```

        ; it != vt2.end(); ++it )
        {
            ProcessASeries(s, it->c_str());
        }
    }
public:
void Print( std::ostream & os )
{
    os << "Sorted Files:  " << std::endl;
    for(
        std::vector< Directory::FilenameType >::const_iterator it = SortedFiles.begin();
        it != SortedFiles.end(); ++it )
    {
        os << "Group:  " << std::endl;
        for(
            Directory::FilenameType::const_iterator file = it->begin();
            file != it->end(); ++file)
        {
            os << *file << std::endl;
        }
    }
    os << "Unsorted Files:  " << std::endl;
    for(
        std::vector< Directory::FilenameType >::const_iterator it = UnsortedFiles.begin();
        it != UnsortedFiles.end(); ++it )
    {
        os << "Group:  " << std::endl;
        for(
            Directory::FilenameType::const_iterator file = it->begin();
            file != it->end(); ++file)
        {
            os << *file << std::endl;
        }
    }
}

std::vector< Directory::FilenameType > const & GetSortedFiles()const { return SortedFiles; }
std::vector< Directory::FilenameType > const & GetUnsortedFiles()const { return UnsortedFiles; }
void ProcessIntoVolume( Scanner const & s )
{
    gdcm::Scanner::ValueType vt1 = s.GetValues( gdcm::t1 );
    for(
        gdcm::Scanner::ValueType::const_iterator it = vt1.begin()
        ; it != vt1.end(); ++it )
    {
        ProcessAStudy( s, it->c_str() );
    }
};
} // namespace gdcm
int main(int argc, char *argv[])
{
    std::string dirl;
    if( argc < 2 )
    {
        const char *extradataroot = nullptr;
#ifdef GDCM_BUILD_TESTING
        extradataroot = gdcm::Testing::GetDataExtraRoot();
#endif
        if( !extradataroot )
        {
            return 1;
        }
        dirl = extradataroot;
        dirl += "/gdcmSampleData/ForSeriesTesting/VariousIncidences/ST1";
    }
    else
    {
        dirl = argv[1];
    }
    gdcm::Directory d;
    d.Load( dirl.c_str(), true ); // recursive !
    gdcm::Scanner s;
    s.AddTag( gdcm::t1 );
    s.AddTag( gdcm::t2 );
    s.AddTag( gdcm::t3 );
    s.AddTag( gdcm::t4 );
    bool b = s.Scan( d.GetFilesNames() );
    if( !b )
    {
        std::cerr << "Scanner failed" << std::endl;
        return 1;
    }
}

```

```

    }
    gdcmm::DiscriminateVolume dv;
    dv.ProcessIntoVolume( s );
    dv.Print( std::cout );
    return 0;
}

```

## 12.49 DumpADAC.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * the goal of this example is to mimic the behavior of disp_img_header
 * see http://www.gmccorp-usa.com/IM/NM/GC/ADAC/SV/adactechtips/Released_01Q3.pdf
 */
#include "gdcmmReader.h"
#include "gdcmmPrivateTag.h"
#include "gdcmmAttribute.h"
#include "gdcmmImageWriter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <string.h>
#include <assert.h>
#include <stdint.h>
struct dict
{
    uint16_t key;
    const char *name;
};
dict Array[] = {
    { 0x01, "Patient name" },
    { 0x02, "Patient ID" },
    { 0x03, "Patient sex" },
    { 0x04, "Patient age" },
    { 0x05, "Patient height" },
    { 0x06, "Patient weight" },
    { 0x07, "Exam date" },
    { 0x08, "Dose admin. time" },
    { 0x09, "Unique exam key" },
    { 0x0a, "Exam procedure" },
    { 0x0b, "Referring physician" },
    { 0x0c, "Attending physician" },
    { 0x0d, "Imaging modality" },
    { 0x0e, "Hospital ID" },
    { 0x0f, "Histogram crv file" },
    { 0x10, "Acq. start time" },
    { 0x11, "Object data type" },
    { 0x12, "Image viewid" },
    { 0x13, "Imaging device name" },
    { 0x14, "Device serial number" },
    { 0x15, "Collimator" },
    { 0x16, "Software version" },
    { 0x17, "Radiopharmaceutical #1" },
    { 0x18, "Energy window #1 center" },
    { 0x19, "Radiopharmaceutical #2" },
    { 0x1a, "Energy window #1 width" },
    { 0x1b, "Isotope imaging mode" },
    { 0x1c, "Energy window #2 center" },
    { 0x1d, "Energy window #2 width" },
    { 0x1e, "Energy window #3 center" },
    { 0x1f, "Energy window #3 width" },
    { 0x20, "Energy window #4 center" },
    { 0x21, "Energy window #4 width" },
    { 0x22, "??Energy window #5 center" },
    { 0x23, "??Energy window #5 width" },
}

```

```

{ 0x24, "Patient orientation" },
{ 0x25, "Spatial resolution" },
{ 0x26, "Slice thickness" },
{ 0x27, "Image X dimension" },
{ 0x28, "Image Y dimension" },
{ 0x29, "Image Z dimension" },
{ 0x2a, "Image pixel width" },
{ 0x2b, "Uniformity corr. file" },
{ 0x2c, "Acquisition zoom factor" },
{ 0x2d, "Total counts in set" },
{ 0x2e, "Time / frame" },
{ 0x2f, "Total acq. time" },
{ 0x30, "Maximum pixel value" },
{ 0x31, "Minimum pixel value" },
{ 0x32, "R-R interval time" },
{ 0x33, "Percent of cycle imaged" },
{ 0x34, "# of cycles accepted" },
{ 0x35, "# of cycles rejected" },
{ 0x36, "Approximate ED frame" },
{ 0x37, "Approximate ES frame" },
{ 0x38, "Approximate EF" },
{ 0x39, "Starting angle" },
{ 0x3a, "Degrees of rotation" },
{ 0x3b, "Direction of rotation" },
{ 0x3c, "Cont. or step/shoot" },
{ 0x3d, "Lim recon start frame" },
{ 0x3e, "Upper window grey shade" },
{ 0x3f, "Lower lvl grey shade" },
{ 0x40, "Associated color map" },
{ 0x41, "Custom color map file" },
{ 0x42, "Manipulated image" },
{ 0x43, "Axis of rotation corr." },
{ 0x44, "Reorientation azimuth" },
{ 0x45, "Reorientation elevation" },
{ 0x46, "Filter type" },
{ 0x47, "Filter order" },
{ 0x48, "Filter cutoff frequency" },
{ 0x49, "Reconstruction type" },
{ 0x4a, "Attenuation coefficient" },
{ 0x4b, "Associated parent file" },
{ 0x4c, "Unique patient key" },
{ 0x52, "Normalization crv file" },
{ 0x53, "Unique object key" },
{ 0x54, "This phase of VFR is" },
{ 0x55, "True color value" },
{ 0x56, "# of sets of x,y,z grps" },
{ 0x57, "Scale factor of set" },
{ 0x6d, "Date of birth" },
{ 0x6e, "Directional orientation" },
{ 0x6f, "Number of VFR studies" },
{ 0x70, "R-R low tolerance" },
{ 0x71, "R-R high tolerance" },
{ 0x72, "Prog specific results:" },
{ 0x99, nullptr }
};

void printname( int , int , uint16_t v )
{
    if( v == 0x1 )
    {
        std::cout << "DATABASE PARAMETERS" << std::endl;
        std::cout << "_____" << std::endl;
    }
    else if( v == 0x27 )
    {
        std::cout << "IMAGE PARAMETERS" << std::endl;
        std::cout << "_____" << std::endl;
    }
    else if( v == 0x13 )
    {
        std::cout << "EXTRA PARAMETERS" << std::endl;
        std::cout << "_____" << std::endl;
    }
    else if( v == 0x2e )
    {
        std::cout << "*** NOT CURRENTLY USED :" << std::endl;
    }
    static const unsigned int n = sizeof( Array ) / sizeof( *Array ) - 1;
    for( unsigned int i = 0; i < n; ++i )
    {
        if( v == Array[i].key )
        {

```



```

        std::cout << /*" " < std::dec < len < ", " < mult < " " < */ Array[i].name;
        std::cout << " : ";
        return;
    }
}
std::cout << /*"\t# " < std::dec < len < ", " < mult < */ std::hex < v < "\t: ";
}
uint16_t readint16(std::istream &is )
{
    uint16_t val;
    is.read( (char*)&val, sizeof( val ));
    return (uint16_t)((val>8) | (val<8));
}
uint32_t readint32(std::istream &is )
{
    uint32_t val;
    is.read( (char*)&val, sizeof( val ));
    val= ((val<8)&0xFF00FF00) | ((val>8)&0x00FF00FF);
    return (val>16) | (val<16);
}
float readfloat32(std::istream &is )
{
    union { uint32_t val; float f;} dual;
    dual.val = readint32(is);
    return dual.f;
}
struct el
{
    uint16_t v1;
    uint16_t v2;
    uint16_t v3;
    void read( std::istream & is )
    {
        v1 = readint16(is);
        v2 = readint16(is);
        v3 = readint16(is);
    }
    void print( std::ostream & os )
    {
        os << std::hex << v1 << "\t" << v2 << "\t" << v3 << std::endl;
    }
};
std::vector<el> Vel;
void readelement( std::istream & is )
{
    el e;
    e.read( is );
    Vel.push_back( e );
}
void printascii( uint16_t tag, const char *buffer, size_t len )
{
    std::ostream & os = std::cout;
    if( tag == 0x72 )
    {
        os << "\n ";
        for(size_t i = 0; i < len; ++i)
        {
            const char &c = buffer[i];
            if( c == 0x0 ) os << "!";
            else if( c == 0x0f ) os << " ";
            else if( c == 0x17 ) os << ":";
            else if( c == 0x14 ) os << ":";
            else if( c == 0x10 ) os << ":";
            else if( c == 0x16 ) os << ":";
            else if( c == 0x08 ) os << ":";
            else if( c == 0x0b ) os << ":";
            else if( c == 0x0e ) os << ":";
            else if( c == 0x07 ) os << ":";
            else os << c;
        }
        os << " ";
    }
    else
    {
        (void)len;
        os << " " << buffer << " ";
    }
}
bool DumpADAC( std::istream & is )
{
    std::ostream &os = std::cout;

```

```

char magic[6 + 1];
magic[6] = 0;
is.read( magic, 6);
// std::cout << magic << " ";
assert( strcmp( magic, "adac01" ) == 0 );
int c = is.get();
assert( c == 0 ); (void)c;
c = is.get();
assert( c == 'X' );
uint16_t v;
v = readint16(is);
// std::cout << v << std::endl;
assert( v == 512 ); (void)v; // ??
int nel = 87;
for (int i = 0; i <= nel; ++i )
{
    readelement( is );
}
char buffer[512];
for( int i = 0; i <= nel; ++i )
{
    const el &e = Vel[i];
    int diff;
    if( i == nel )
    {
        diff = 2048 - e.v3;
        if( diff > 512 ) diff = 512;
    }
    else
    {
        const el &enext = Vel[i+1];
        diff = enext.v3 - e.v3;
    }
    is.seekg( e.v3, std::ios::beg );
    //std::cout << "(" << std::hex << std::setw( 2 ) << std::setfill( '0' ) << e.v1 << ")" " << std::hex << std::setw( 3
    ) << std::setfill( '0' ) << e.v2 << " ";
    printname( diff, 0, e.v1 );
    int mult = 1;
    if( e.v2 == 0 )
    {
        is.read( buffer, diff);
        buffer[ diff ] = 0;
        printascii( e.v1, buffer, diff);
    }
    else if( e.v2 == 0x100 )
    {
        mult = diff / 2;
        assert( diff == 2 * mult );
        for ( int ii = 0; ii < mult; ++ii )
        {
            if ( ii ) os << "\\n";
            uint16_t val = readint16(is);
            os << " " << std::dec << val << " ";
        }
    }
    else if( e.v2 == 0x200 )
    {
        assert( diff == 4 );
        uint32_t val = readint32(is);
        os << " " << std::dec << val << " ";
    }
    else if( e.v2 == 0x300 )
    {
        assert( diff == 4 );
        float val = readfloat32(is);
        os << " " << std::dec << val << " ";
    }
    else
    {
        assert( 0 );
    }
    os << std::endl;
}
return true;
}
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );

```

```

if( !reader.Read() )
{
    std::cerr << "Failed to read: " << filename << std::endl;
    return 1;
}
const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
// (0019,1061) UN (OB) 61\64\61\63\30          # 2048,1 Ver200 ADAC Pegasys Headers
const gdcm::PrivateTag tver200adacpegasysheaders(0x0019,0x61,"ADAC_IMG");
if( !ds.FindDataElement( tver200adacpegasysheaders ) ) return 1;
const gdcm::DataElement& ver200adacpegasysheaders = ds.GetDataElement( tver200adacpegasysheaders );
if ( ver200adacpegasysheaders.IsEmpty() ) return 1;
const gdcm::ByteValue *bv = ver200adacpegasysheaders.GetByteValue();
// (0019,1021) US 1                          # 2,1 Ver200 Number of ADAC Headers
// TODO
// (0019,1041) IS [2048\221184 ] # 12,1-n Ver200 ADAC Header/Image Size
if( bv->GetLength() != 2048 ) return 1;
gdcm::Element<gdcm::VR::IS,gdcm::VM::VM2> el;
const gdcm::PrivateTag tver200adacheaderimagesize(0x0019,0x41,"ADAC_IMG");
if( !ds.FindDataElement( tver200adacheaderimagesize ) ) return 1;
const gdcm::DataElement& ver200adacheaderimagesize = ds.GetDataElement( tver200adacheaderimagesize );
el.SetFromDataElement( ver200adacheaderimagesize );
if( el.GetValue(0) != 2048 ) return 1;
std::stringstream is;
std::string dup( bv->GetPointer(), bv->GetLength() );
is.str( dup );
bool b = DumpADAC( is );
if( !b ) return 1;
return 0;
}

```

## 12.50 DumpExamCard.cxx

/\*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====\*/  
/\*

Try to extract contents of Philips RAW storage class:

```

(0002,0002) UI [1.2.840.10008.5.1.4.1.1.66]          # 26,1 Media Storage SOP Class UID
(0002,0003) UI [1.3.46.670589.11.17240.5.23.4.1.3012.2010032409482568018] # 56,1 Media Storage SOP
Instance UID
(0002,0010) UI [1.2.840.10008.1.2.1]                # 20,1 Transfer Syntax UID
(0002,0012) UI [1.3.46.670589.11.0.0.51.4.4.1]      # 30,1 Implementation Class UID
(0002,0013) SH [MR DICOM 4.1]                       # 12,1 Implementation Version Name

```

\* Everything done in this code is for the sole purpose of writing interoperable  
\* software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.  
\* If you believe anything in this code violates any law or any of your rights,  
\* please contact us (gdcm-developers@lists.sourceforge.net) so that we can  
\* find a solution.

\*  
\* Everything you do with this code is at your own risk, since decompression  
\* algorithm was not written from specification documents.

\*  
\* Special thanks to:  
\* Triplett, William T for bringing to your attention on this ExamCard stuff

```

*/
#include "gdcmReader.h"
#include "gdcmDataSet.h"
#include "gdcmPrivateTag.h"
#include "gdcmBase64.h"
#include <iomanip>
static bool compfn(const char *s1, const char *s2)
{
    return strcmp(s1,s2) < 0 ? true : false;
}

```

```

static const char *PDFStrings[] = { // Keep me ordered please
    "COILSTATE", // series of string ?
    "HARDWARE_CONFIG", // series of number ?
    "PDF_CONTROL_GEN_PARS",
    "PDF_CONTROL_PREP_PARS",
    "PDF_CONTROL_RECON_PARS",
    "PDF_CONTROL_SCAN_PARS",
    "PDF_EXAM_PARS",
    "PDF_HARDWARE_PARS",
    "PDF_PREP_PARS",
    "PDF_PRESCAN_COIL_PARS",
    "PDF_SPT_PARS",
};
static bool isvalidpdfstring( const char *pdfstring )
{
    assert( pdfstring );
    static const size_t n = sizeof( PDFStrings ) / sizeof( *PDFStrings );
    static const char **begin = PDFStrings;
    static const char **end = begin + n;
    return std::binary_search(begin, end, pdfstring, compfn);
}
typedef enum
{
    param_float = 0,
    param_integer = 1, // 1 « 0
    param_string = 2, // 1 « 1
    param_3, // ??
    param_enum = 4 // 1 « 2
} param_type;
static const char *gettypenamefromtype( int i)
{
    const char *ret = nullptr;
    param_type e = (param_type)i;
    switch( e )
    {
        case param_float:
            ret = "float";
            break;
        case param_integer:
            ret = "int";
            break;
        case param_string:
            ret = "string";
            break;
        case param_3:
            ret = "??";
            break;
        case param_enum:
            ret = "enum";
            break;
    }
    assert( ret );
    return ret;
}
struct header
{
    /*
    * TODO:
    * Looks as if we could read all int*, float* and string* at once...
    */
    int32_t v1; // offset to int pointer array ?
    uint16_t nints; // number of ints (max number?)
    uint16_t v3; // always 0 ?
    int32_t v4; // offset to float pointer array ?
    uint32_t nfloats;
    int32_t v6; // offset to string pointer array ?
    uint32_t nstrings;
    int32_t v8; // always 8 ??
    uint32_t numparams;
    uint32_t getnints()const { return nints; }
    uint32_t getnfloats()const { return nfloats; }
    uint32_t getnstrings()const { return nstrings; }
    uint32_t getnparams()const { return numparams; }
    void read( std::istream & is )
    {
        is.read( (char*)&v1, sizeof(v1));
        if( v1 == 0x01 ) {
            // direct (FIXME how should we detect this, much like TIFF ??)
            nints = 0;
            v3 = 0;
            v4 = 0;

```

```

    nfloats = 0;
    v6 = 0;
    nstrings = 0;
    v8 = 0;
    numparams = 0;
    uint32_t bla;
    is.read( (char*)&bla, sizeof(bla) );
    assert( bla == 0x2 || bla == 0x3 );
    nstrings = 1;
    numparams = 1;
} else {
    // indirect
    is.read( (char*)&nints, sizeof(nints));
    is.read( (char*)&v3, sizeof(v3));
    assert( v3 == 0 ); // looks like this is always 0
    is.read( (char*)&v4, sizeof(v4));
    is.read( (char*)&nfloats, sizeof(nfloats));
    is.read( (char*)&v6, sizeof(v6));
    is.read( (char*)&nstrings, sizeof(nstrings));
    is.read( (char*)&v8, sizeof(v8));
    assert( v8 == 8 );
    is.read( (char*)&numparams, sizeof(numparams));
}
}
}
void print( std::ostream & os )
{
    os << v1 << ", ";
    os << nints << ", ";
    os << v3 << ", ";
    os << v4 << ", ";
    os << nfloats << ", ";
    os << v6 << ", ";
    os << nstrings << ", ";
    os << v8 << ", ";
    os << numparams << std::endl;
}
};
struct param
{
    char name[32+1];
    uint8_t boolean;
    int32_t type;
    uint32_t dim;
    union {
        uint32_t val;
        char * ptr; } v4;
    int32_t /*std::streamoff*/ offset;
    param_type gettype()const { return (param_type)type; }
    uint32_t getdim()const { return dim; }
    void read_direct_int( std::istream & is ) {
        uint32_t bla;
        int max = 9;
        std::vector<uint32_t> v;
        for( int i = 0; i < max; ++i ) {
            is.read( (char*)&bla, sizeof(bla) );
            v.push_back( bla );
        }
        is.read( (char*)&bla, sizeof(bla) );
        char name0[32];
        memset(name0, 0, sizeof(name0));
        assert( bla < sizeof(name0) );
        is.read( name0, bla );
        size_t l = strlen(name0);
        assert( l == bla ); (void)l;
        char * ptr = strdup( name0 );
        v4.ptr = ptr;
        type = param_string;
        dim = 1;
        offset = 0; // important !
    }
}
void read_direct_string( std::istream & is ) {
    uint32_t bla;
    is.read( (char*)&bla, sizeof(bla) );
    char name0[32];
    memset(name0, 0, sizeof(name0));
    assert( bla < sizeof(name0) );
    is.read( name0, bla );
    size_t l = strlen(name0);
    assert( l == bla ); (void)l;
    memcpy( this->name, name0, bla );
    is.read( (char*)&bla, sizeof(bla) );

```

```

assert( bla == 0x1 );
is.read( (char*)&bla, sizeof(bla) );
char value[32];
memset(value,0,sizeof(value));
assert( bla < sizeof(value) );
is.read( value, bla);
is.read( (char*)&bla, sizeof(bla) );
assert( bla == 0 ); // trailing stuff ?
is.read( (char*)&bla, sizeof(bla) );
assert( bla == 0 ); // trailing stuff ?
const uint32_t cur = (uint32_t)is.tellg();
std::cerr << "offset:" << cur << std::endl;
if( cur == 65 )
    is.read( (char*)&bla, 1 );
else if( cur == 66 )
    is.read( (char*)&bla, 1 );
else if( cur == 122 )
    is.read( (char*)&bla, 2 );
else
    assert(0);
type = param_string;
dim = 1;
// FIXME: store the value in v4 for now:
char * ptr = strdup( value );
v4.ptr = ptr;
offset = 0; // important !
}
void read( std::istream & is )
{
    is.read( name, 32 + 1);
    // This is always the same issue the string can contains garbage from previous run,
    // we need to print only until the first \0 character:
    assert( strlen( name ) <= 32 );
    is.read( (char*)&boolean,1);
    assert( boolean == 0 || boolean == 1 || boolean == 0x69 ); // some kind of bool, or digital trash ?
    is.read( (char*)&type, sizeof( type ) );
    assert( gettypenamefromtype( type ) );
    is.read( (char*)&dim, sizeof( dim ) ); // number of elements
    is.read( (char*)&v4.val, sizeof( v4.val ) );
    //assert( v4.val == 0 ); // always 0 ? sometimes not...
    const uint32_t cur = (uint32_t)is.tellg();
    is.read( (char*)&offset, sizeof( offset ) );
    assert( offset != 0 );
    offset += cur;
}
void print( std::ostream & os )const
{
    os << name << ",";
    os << (int)boolean << ",";
    os << type << ",";
    os << dim << ",";
    os << v4.val << ",";
    os << offset << std::endl;
}
void printvalue( std::ostream & os, std::istream & is )const
{
    if( offset ) {
        is.seekg( offset );
        switch( type )
        {
            case param_float:
            {
                os.precision(2);
                os << std::fixed;
                for( uint32_t idx = 0; idx < dim; ++idx )
                {
                    if( idx ) os << ",";
                    float v;
                    is.read( (char*)&v, sizeof(v) );
                    os << v; // what if the string contains \0 ?
                }
            }
            break;
            case param_integer:
            {
                int32_t v;
                for( uint32_t idx = 0; idx < dim; ++idx )
                {
                    if( idx ) os << ",";
                    is.read( (char*)&v, sizeof(v) );
                    os << v;
                }
            }
        }
    }
}

```

```

    }
}
break;
case param_string:
{
    int size = 81;
    std::string v;
    v.resize( size );
    for( uint32_t idx = 0; idx < dim; ++idx )
    {
        if( idx ) os << ",";
        is.read( &v[0], size );
        os << v.c_str();
    }
}
break;
case param_enum:
{
    int32_t v;
    for( uint32_t idx = 0; idx < dim; ++idx )
    {
        if( idx ) os << ",";
        is.read( (char*)&v, sizeof(v) );
        os << v;
    }
}
break;
}
} else {
#ifdef 1
    // direct
    assert ( type == param_string );
    char * ptr = v4.ptr;
    //std::string v;
    //v.resize( dim );
    //is.read( &v[0], dim );
    os << ptr;
#endif
}
}
void printxml( std::ostream & os, std::istream & is )const
{
    // <Attribute Name="CGEN_force_par_mode" Type="enum">0</Attribute>
    os << " <Attribute";
    os << " Name=\"" << name << "\"";
    os << " Type=\"" << gettypenamefromtype(type) << "\"";
    if( dim != 1 )
    {
        os << " ArraySize=\"" << dim << "\"";
    }
    os << ">";
    printvalue( os, is );
    os << "</Attribute>\n";
}
void printcsv( std::ostream & os, std::istream & is )const
{
    os << std::setw(32) << std::left << name << ",";
    os << std::setw(7) << std::right << gettypenamefromtype(type) << ",";
    os << std::setw(4) << dim << ",";
    os << " ";
    printvalue( os, is );
    os << ",\n";
}
};
static bool ProcessNested( gdc::DataSet & ds )
{
    /*
    TODO:
    Looks like the real length of the blob is stored here:
    (2005,1132) SQ # u/1,1 ?
    (ffff,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ] # 26,1 Private Creator
    (2005,1143) SL 3103 # 4,1 ?

    Wotsit ?
    (2005,1132) SQ # u/1,1 ?
    (ffff,e000) na (Item with undefined length)
    (2005,0011) LO [Philips MR Imaging DD 002 ] # 26,1 Private Creator
    (2005,1147) CS [Y ] # 2,1 ?
    */
    bool ret = false;

```

```

// (2005,1137) PN (LO) [PDF_CONTROL_GEN_PARS] # 20,1 Protocol Data Name
const gdcmm::PrivateTag pt0(0x2005,0x37,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt0 ) ) return false;
const gdcmm::DataElement &de0 = ds.GetDataElement( pt0 );
if( de0.IsEmpty() ) return false;
const gdcmm::ByteValue * bv0 = de0.GetByteValue();
std::string s0( bv0->GetPointer() , bv0->GetLength() );
// (2005,1139) LO [IEEE_PDF] # 8,1 Protocol Data Type
const gdcmm::PrivateTag pt1(0x2005,0x39,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt1 ) ) return false;
const gdcmm::DataElement &de1 = ds.GetDataElement( pt1 );
// (2005,1143) SL 53 # 4,1 Protocol Data Block Length (non-padded)
const gdcmm::PrivateTag pt2(0x2005,0x43,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt2 ) ) return false;
const gdcmm::DataElement &de2 = ds.GetDataElement( pt2 );
// (2005,1147) CS [Y] # 2,1 Protocol Data Boolean
const gdcmm::PrivateTag pt3(0x2005,0x47,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt3 ) ) return false;
const gdcmm::DataElement &de3 = ds.GetDataElement( pt3 );
(void)de3;
// (2005,1144) OW 00\00\00\00\05\00\00\00\35\2e\31\2e\37\00 # 54,1 Protocol Data Block
const gdcmm::PrivateTag pt(0x2005,0x44,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt ) ) return false;
const gdcmm::DataElement &de = ds.GetDataElement( pt );
if( de.IsEmpty() ) return false;
const gdcmm::ByteValue * bv = de.GetByteValue();
if( s0 == "ExamCardBlob" )
{
    assert( de1.IsEmpty() );
    std::string fn = gdcmm::LOComp::Trim( s0.c_str() ); // remove trailing space
    fn += ".xml";
    std::ofstream out( fn.c_str() );
    // remove trailing \0
    size_t len = strlen( bv->GetPointer() );
    out.write( bv->GetPointer() , len );
    out.close();
    // Extract binary64 thingy (this is a ugly hack, better use an XML parser)
    std::string dup( bv->GetPointer(), len );
    std::string::size_type pos1 = dup.find( "<ExamCardBlob>" );
    std::string::size_type pos2 = dup.find( "</ExamCardBlob>" );
    std::string b64( bv->GetPointer() + pos1 + 14, pos2 - (pos1 + 14) );
    // ugly hack to remove \r\n from input base64:
    std::string::iterator r_pos = std::remove(b64.begin(), b64.end(), '\r');
    b64.erase(r_pos, b64.end());
    std::string::iterator n_pos = std::remove(b64.begin(), b64.end(), '\n');
    b64.erase(n_pos, b64.end());
}
#if 0
std::ofstream out2( "debug" );
out2.write( b64.c_str(), b64.size() );
out2.close();
#endif
const size_t dlen = gdcmm::Base64::GetDecodeLength(b64.c_str(), b64.size() );
std::string decoded;
decoded.resize( dlen );
gdcmm::Base64::Decode( &decoded[0], decoded.size(), b64.c_str(), b64.size() );
std::ofstream f64( "soap.xml" );
f64.write( decoded.c_str(), decoded.size() );
f64.close();
ret = true;
}
else
{
    if( de1.IsEmpty() ) return false;
    const gdcmm::ByteValue * bv1 = de1.GetByteValue();
    gdcmm::Element<gdcmm::VR::SL,gdcmm::VM::VML> dlen = {{01}};
    dlen.SetFromDataElement( de2 );
    std::string s1( bv1->GetPointer() , bv1->GetLength() );
    if( s1 == "IEEE_PDF" )
    {
        std::istringstream is;
        assert( bv->GetLength() == (size_t)dlen.GetValue() || bv->GetLength() == (size_t)(dlen.GetValue() + 1) );
        std::string dup( bv->GetPointer(), dlen.GetValue() /*bv->GetLength()*/ );
        is.str( dup );
        header h;
        h.read( is );
        //assert( is.peek() && is.eof() );
    }
}
#if 1
static int c = 0;
std::string fn0 = gdcmm::LOComp::Trim( s1.c_str() ); // remove trailing space
std::stringstream ss;
ss << fn0 << "_" << c++;

```



```

    if( h.v1 == 0x01 )
        ss << ".direct";
    else
        ss << ".indirect";
    std::cout << "fn0=" << ss.str() << " Len= " << bv->GetLength() << std::endl;
    std::ofstream out( ss.str().c_str() );
    out.write( bv->GetPointer(), bv->GetLength() );
    out.close();
#endif
#if 1
    std::cout << dup.c_str() << std::endl;
    h.print( std::cout );
#endif
std::vector< param > params;
if( h.v1 == 0x01 ) {
    for( uint32_t i = 0; i < 1 /* h.getnparams() */; ++i ) {
        param p;
        if( s0 == "HARDWARE_CONFIG " )
        {
            p.read_direct_int( is );
        }
        else if( s0 == "COILSTATE " )
        {
            p.read_direct_string( is );
        }
        else
        {
            assert(0);
        }
        params.push_back( p );
    }
} else {
    assert( is.tellg() == std::streampos(0x20) );
    is.seekg( 0x20 );
    param p;
    for( uint32_t i = 0; i < h.getnparams(); ++i )
    {
        p.read( is );
        //p.print( std::cout );
        params.push_back( p );
    }
}
std::string fn = gdc::LOComp::Trim( s0.c_str() ); // remove trailing space
bool b1 = isvalidpdfstring( fn.c_str() );
assert( b1 ); (void)b1;
fn += ".csv";
//fn += ".xml";
std::ofstream csv( fn.c_str() );
// let's do some bookkeeping:
uint32_t nfloats = 0;
uint32_t nints = 0;
uint32_t nstrings = 0;
for( std::vector<param>::const_iterator it = params.begin();
    it != params.end(); ++it )
{
    param_type type = it->gettype();
    switch( type )
    {
        {
        case param_float:
            nfloats += it->getdim();
            break;
        case param_integer:
            nints += it->getdim();
            break;
        case param_string:
            nstrings += it->getdim();
            break;
        default:
            ;
        }
    }
}
#if 0
    std::cout << "Stats:" << std::endl;
    std::cout << "nfloats:" << nfloats << std::endl;
    std::cout << "nints:" << nints << std::endl;
    std::cout << "nstrings:" << nstrings << std::endl;
#endif
assert( h.getnints() >= nints );
assert( h.getnfloats() >= nfloats );
assert( h.getnstrings() >= nstrings );
for( uint32_t i = 0; i < h.getnparams(); ++i )

```

```

        {
            params[i].printcsv( csv, is );
            //params[i].printxml( csv, is );
        }
        csv.close();
        ret = true;
    }
    else if( s1 == "ASCII " )
    {
#ifdef 0
        std::cerr << "ASCII is not handled" << std::endl;
        std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
        fn += ".asc";
        std::ofstream out( fn.c_str() );
        out.write( bv->GetPointer() , bv->GetLength() );
        out.close();
#endif
        std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
        fn += ".sin";
        std::ofstream sin( fn.c_str() );
        const char *beg = bv->GetPointer();
        const char *end = beg + bv->GetLength();
        assert( *beg == 0 );
        const char *p = beg + 1; // skip first \0
        size_t prev = 0;
        for( ; p != end; ++p )
        {
            if( *p == 0 )
            {
                const char *s = beg + prev + 1;
                if( *s )
                {
                    sin << s << std::endl;
                }
                else
                {
                    sin << std::endl;
                }
                prev = p - beg;
            }
        }
        sin.close();
        ret = true;
    }
    else if( s1 == "BINARY" )
    {
        std::cerr << "BINARY is not handled" << std::endl;
        std::string fn = gdcm::LOComp::Trim( s0.c_str() ); // remove trailing space
        fn += ".bin";
        std::ofstream out( fn.c_str() );
        //out.write( bv->GetPointer() + 512, bv->GetLength() - 512);
        out.write( bv->GetPointer() , bv->GetLength() );
        out.close();
#ifdef 0
        int array[ 128 ];
        memcpy( array, bv->GetPointer(), 512 );
        for( int i = 0; i < 14; ++i )
        {
            std::cout << array[i] << std::endl;
        }
#endif
        ret = true;
    }
}
// else -> ret == false
assert( ret );
return ret;
}
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
}
/*

```

```

(2005,1132) SQ # u/1,1 ?
(ffff,e000) na (Item with undefined length)
(2005,0011) LO [Philips MR Imaging DD 002 ] # 26,1 Private Creator
(2005,1137) PN (LO) [PDF_CONTROL_GEN_PARS] # 20,1 ?
(2005,1138) PN (LO) (no value) # 0,1 ?
(2005,1139) PN (LO) [IEEE_PDF] # 8,1 ?
(2005,1140) PN (LO) (no value) # 0,1 ?
(2005,1141) PN (LO) (no value) # 0,1 ?
(2005,1143) SL 3103 # 4,1 ?
(2005,1144) OW
    66\05\00\00\3b\01\00\00\4a\0a\00\00\0e\00\00\00\7a\0a\00\00\95\01\00\00\08\00\00\00\1b\00\00\00\43\47\45\4e\5f\75\73\65\72\5
    # 3104,1 ?
(2005,1147) CS [Y ] # 2,1 ?
(ffff,e00d)
*/
const gdcm::PrivateTag pt(0x2005,0x32,"Philips MR Imaging DD 002");
if( !ds.FindDataElement( pt ) ) return 1;
const gdcm::DataElement &de = ds.GetDataElement( pt );
if( de.IsEmpty() ) return 1;
gdcm::SequenceOfItems *sqi = de.GetValueAsSQ();
if ( !sqi ) return 1;
gdcm::SequenceOfItems::SizeType s = sqi->GetNumberOfItems();
for( gdcm::SequenceOfItems::SizeType i = 1; i <= s; ++i )
{
    gdcm::Item &item = sqi->GetItem(i);
    gdcm::DataSet &nestedds = item.GetNestedDataSet();
    if( !ProcessNested( nestedds ) ) {
        std::cerr << "Error processing Item #" << i << std::endl;
    }
}
return 0;
}

```

## 12.51 DumpGEMSMovieGroup.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

```

```

=====*/
#include "gdcmReader.h"
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include "gdcmUIDGenerator.h"
#include <iostream>
#include <string>
#include <map>
bool PrintNameValuePairMapping( gdcm::SequenceOfItems *sqi_values,
gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
    using namespace gdcm;
    // prepare names mapping:
    typedef VRToType<VR::UL>::Type UL;
    std::map< UL, std::string > names;
    assert( sqi_names );
    assert( sqi_values );
    SequenceOfItems::SizeType s = sqi_names->GetNumberOfItems();
    PrivateTag tindex(0x7fel,0x71,"GEMS_Ultrasound_MovieGroup_001");
    PrivateTag tname (0x7fel,0x72,"GEMS_Ultrasound_MovieGroup_001");
    // First sequence contains all possible names (this is a dict)
    for( SequenceOfItems::SizeType i = 1; i <= s; ++i )
    {
        const Item & item = sqi_names->GetItem( i );
        const DataSet & ds = item.GetNestedDataSet();
        if( !ds.FindDataElement( tindex )
            || !ds.FindDataElement( tname ) )
        {

```

```

    assert( 0 );
    return false;
}
const DataElement & index = ds.GetDataElement( tindex );
const DataElement & name = ds.GetDataElement( tname );
if( index.IsEmpty() || name.IsEmpty() )
{
    assert( 0 );
    return false;
}
gdcm::Element<VR::UL, VM::VM1> el1;
el1.SetFromDataElement( index );
gdcm::Element<VR::LO, VM::VM1> el2;
el2.SetFromDataElement( name );
// std::cout << el1.GetValue() << " " << el2.GetValue() << std::endl;
names.insert( std::make_pair( el1.GetValue(), el2.GetValue() ) );
}
SequenceOfItems::SizeType s2 = sqi_values->GetNumberOfItems();
assert( s2 <= s );
PrivateTag tindex2(0x7fe1,0x48,"GEMS_Ultrasound_MovieGroup_001");
for( SequenceOfItems::SizeType i = 1; i <= s2; ++i )
{
    const Item & item = sqi_values->GetItem( i );
    const DataSet & ds = item.GetNestedDataSet();
    if( !ds.FindDataElement( tindex2 ) )
    {
        assert( 0 );
        return false;
    }
    const DataElement & index2 = ds.GetDataElement( tindex2 );
    if( index2.IsEmpty() )
    {
        assert( 0 );
        return false;
    }
    gdcm::Element<VR::FD, VM::VM1_2> el1;
    el1.SetFromDataElement( index2 );
    UL copy = (UL)el1.GetValue();
#ifdef 1
    std::cout << indent;
    std::cout << "( " << names[ copy ];
#endif
    // (7fe1,1052) FD 1560 # 8,1 ?
    // (7fe1,1057) LT [MscSkelSup] # 10,1 ?
    //PrivateTag tvalue(0x7fe1,0x52,"GEMS_Ultrasound_MovieGroup_001");
    PrivateTag tvalueint(0x7fe1,0x49,"GEMS_Ultrasound_MovieGroup_001"); // UL
    PrivateTag tvaluefloat1(0x7fe1,0x51,"GEMS_Ultrasound_MovieGroup_001"); // FL
    PrivateTag tvaluefloat(0x7fe1,0x52,"GEMS_Ultrasound_MovieGroup_001"); // FD
    PrivateTag tvalueul(0x7fe1,0x53,"GEMS_Ultrasound_MovieGroup_001"); // UL
    PrivateTag tvaluesl(0x7fe1,0x54,"GEMS_Ultrasound_MovieGroup_001"); // SL
    PrivateTag tvalueob(0x7fe1,0x55,"GEMS_Ultrasound_MovieGroup_001"); // OB
    PrivateTag tvaluetext(0x7fe1,0x57,"GEMS_Ultrasound_MovieGroup_001"); // LT
    PrivateTag tvaluefd(0x7fe1,0x77,"GEMS_Ultrasound_MovieGroup_001"); // FD / 1-N
    PrivateTag tvaluesl3(0x7fe1,0x79,"GEMS_Ultrasound_MovieGroup_001"); // SL / 1-N
    PrivateTag tvaluesl2(0x7fe1,0x86,"GEMS_Ultrasound_MovieGroup_001"); // SL ??
    PrivateTag tvaluefd1(0x7fe1,0x87,"GEMS_Ultrasound_MovieGroup_001"); // FD / 1-N
    PrivateTag tvaluefloat2(0x7fe1,0x88,"GEMS_Ultrasound_MovieGroup_001"); // FD ??
#ifdef 1
    std::cout << " ) = ";
#endif
#ifdef 1
    if( ds.FindDataElement( tvalueint ) )
    {
        const DataElement & value = ds.GetDataElement( tvalueint );
        gdcm::Element<VR::UL,VM::VM1> el2;
        el2.SetFromDataElement( value );
        std::cout << el2.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvaluefloat1 ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefloat1 );
        gdcm::Element<VR::FL,VM::VM1> el2;
        el2.SetFromDataElement( value );
        std::cout << el2.GetValue() << std::endl;
    }
    else if( ds.FindDataElement( tvaluefloat ) )
    {
        const DataElement & value = ds.GetDataElement( tvaluefloat );
        gdcm::Element<VR::FD,VM::VM1> el2;
        el2.SetFromDataElement( value );
        std::cout << el2.GetValue() << std::endl;
    }
}

```

```

else if( ds.FindDataElement( tvalues1 ) )
{
    const DataElement & value = ds.GetDataElement( tvalues1 );
    gdcm::Element<VR::SL,VM::VM1> el2;
    el2.SetFromDataElement( value );
    std::cout << el2.GetValue() << std::endl;
}
else if( ds.FindDataElement( tvalueul ) )
{
    const DataElement & value = ds.GetDataElement( tvalueul );
    gdcm::Element<VR::UL,VM::VM1_n> el2;
    el2.SetFromDataElement( value );
    assert( el2.GetLength() == 1 );
    std::cout << el2.GetValue() << std::endl;
}
else if( ds.FindDataElement( tvalueob ) )
{
    const DataElement & value = ds.GetDataElement( tvalueob );
    // gdcm::Element<VR::SL,VM::VM1> el2;
    // el2.SetFromDataElement( value );
    // std::cout << el2.GetValue() << std::endl;
    std::cout << value << std::endl;
}
else if( ds.FindDataElement( tvaluetext ) )
{
    const DataElement & value = ds.GetDataElement( tvaluetext );
    gdcm::Element<VR::LT,VM::VM1> el2;
    el2.SetFromDataElement( value );
    std::cout << el2.GetValue() << std::endl;
}
else if( ds.FindDataElement( tvaluesl2 ) )
{
    const DataElement & value = ds.GetDataElement( tvaluesl2 );
    gdcm::Element<VR::SL,VM::VM1_n> el2;
    el2.SetFromDataElement( value );
    el2.Print( std::cout );
    assert( el2.GetLength() == 4 );
    std::cout << std::endl;
}
else if( ds.FindDataElement( tvaluesl3 ) )
{
    const DataElement & value = ds.GetDataElement( tvaluesl3 );
    gdcm::Element<VR::SL,VM::VM1_n> el2;
    el2.SetFromDataElement( value );
    el2.Print( std::cout );
    // assert( el2.GetLength() == 4 );
    std::cout << std::endl;
}
else if( ds.FindDataElement( tvaluefd ) )
{
    const DataElement & value = ds.GetDataElement( tvaluefd );
    gdcm::Element<VR::FD,VM::VM1_n> el2;
    el2.SetFromDataElement( value );
    el2.Print( std::cout );
    // assert( el2.GetLength() == 4 || el2.GetLength() == 3 || el2.GetLength() == 8 );
    std::cout << std::endl;
}
else if( ds.FindDataElement( tvaluefloat2 ) )
{
    const DataElement & value = ds.GetDataElement( tvaluefloat2 );
    gdcm::Element<VR::FD,VM::VM1_n> el2;
    el2.SetFromDataElement( value );
    el2.Print( std::cout );
    assert( el2.GetLength() == 2 );
    std::cout << std::endl;
}
else if( ds.FindDataElement( tvaluefd1 ) )
{
    const DataElement & value = ds.GetDataElement( tvaluefd1 );
    gdcm::Element<VR::FD,VM::VM1_n> el2;
    el2.SetFromDataElement( value );
    el2.Print( std::cout );
    assert( el2.GetLength() == 4 );
    std::cout << std::endl;
}
else
{
    std::cout << "(no value)" << std::endl;
    // std::cout << ds << std::endl;
    assert( ds.Size() == 2 );
}

```

```

    }
    return true;
}
bool PrintNameValuePair2( gdcm::PrivateTag const & privtag, const gdcm::DataSet & ds ,
    gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
    if( !ds.FindDataElement( privtag ) ) return false;
    const gdcm::DataElement& seq_values = ds.GetDataElement( privtag );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = seq_values.GetValueAsSQ();
    return PrintNameValuePairMapping( sqi, sqi_names, indent);
}
bool PrintNameValuePair3( gdcm::PrivateTag const & privtag1, gdcm::PrivateTag const & privtag2, const
    gdcm::DataSet & ds ,
    gdcm::SequenceOfItems *sqi_names, std::string const & indent )
{
    if( !ds.FindDataElement( privtag1 ) )
    {
        assert( 0 );
        return false;
    }
    const gdcm::DataElement& values10name = ds.GetDataElement( privtag1 );
    gdcm::Element<gdcm::VR::LO, gdcm::VM::VM1> el;
    el.SetFromDataElement( values10name );
    std::cout << std::endl;
    std::cout << " <" << el.GetValue().c_str() << ">" << std::endl;
    return PrintNameValuePairMapping2( privtag2, ds, sqi_names, indent);
}
bool print73( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    const gdcm::PrivateTag tseq_values73(0x7fe1, 0x73, "GEMS_Ultrasound_MovieGroup_001");
    if( !ds10.FindDataElement( tseq_values73 ) )
    {
        std::cout << indent << "No group 73" << std::endl;
        return false;
    }
    const gdcm::DataElement& seq_values73 = ds10.GetDataElement( tseq_values73 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values73 = seq_values73.GetValueAsSQ();
    size_t ni3 = sqi_values73->GetNumberOfItems();
    for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
        gdcm::Item &item_73 = sqi_values73->GetItem(i3);
        gdcm::DataSet &ds73 = item_73.GetNestedDataSet();
        assert( ds73.Size() == 3 );
        const gdcm::PrivateTag tseq_values74name(0x7fe1, 0x74, "GEMS_Ultrasound_MovieGroup_001");
        const gdcm::PrivateTag tseq_values75(0x7fe1, 0x75, "GEMS_Ultrasound_MovieGroup_001");
        PrintNameValuePairMapping3( tseq_values74name, tseq_values75, ds73, sqi_dict, indent);
        std::cout << std::endl;
    }
    return true;
}
bool print36( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    (void)sqi_dict;
    const gdcm::PrivateTag tseq_values36(0x7fe1, 0x36, "GEMS_Ultrasound_MovieGroup_001");
    if( !ds10.FindDataElement( tseq_values36 ) )
    {
        std::cout << indent << "No group 36" << std::endl;
        return false;
    }
    const gdcm::DataElement& seq_values36 = ds10.GetDataElement( tseq_values36 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values36 = seq_values36.GetValueAsSQ();
    size_t ni3 = sqi_values36->GetNumberOfItems();
    assert( ni3 >= 1 );
    for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
        gdcm::Item &item_36 = sqi_values36->GetItem(i3);
        gdcm::DataSet &ds36 = item_36.GetNestedDataSet();
        assert( ds36.Size() == 4 );
        // (7fe1,1037) UL 47 # 4,1 US MovieGroup Number of Frames
        // (7fe1,1043) OB 40\00\1c\c4\67\2f\0b\11\40 # 376,1 ?
        // (7fe1,1060) OB 4e\4e\49\4f\4e\47\46\43\2a # 4562714,1 US MovieGroup Image Data
        //
        const gdcm::PrivateTag timagedata(0x7fe1, 0x60, "GEMS_Ultrasound_MovieGroup_001");
        assert( ds36.FindDataElement( timagedata ) );
        gdcm::DataElement const & imagedata = ds36.GetDataElement( timagedata );
        const gdcm::ByteValue * bv = imagedata.GetByteValue();
        assert( bv );
        static int c = 0;
        std::stringstream ss;
        ss << "/tmp/debug";
        ss << c++;
    }
}

```

```

        std::ofstream os( ss.str().c_str(), std::ios::binary );
        os.write( bv->GetPointer(), bv->GetLength() );
        os.close();
        //const gdcm::PrivateTag tseq_values85(0x7fe1,0x85,"GEMS_Ultrasound_MovieGroup_001");
        //PrintNameValueMapping3( tseq_values84name, tseq_values85, ds83, sqi_dict, indent);
        //std::cout << std::endl;
    }
    return true;
}

bool print83( gdcm::DataSet const & ds10, gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    const gdcm::PrivateTag tseq_values83(0x7fe1,0x83,"GEMS_Ultrasound_MovieGroup_001");
    if( !ds10.FindDataElement( tseq_values83 ) )
    {
        std::cout << indent << "No group 83" << std::endl;
        return false;
    }
    const gdcm::DataElement& seq_values83 = ds10.GetDataElement( tseq_values83 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values83 = seq_values83.GetValueAsSQ();
    size_t ni3 = sqi_values83->GetNumberOfItems();
    for( size_t i3 = 1; i3 <= ni3; ++i3 )
    {
        gdcm::Item &item_83 = sqi_values83->GetItem(i3);
        gdcm::DataSet &ds83 = item_83.GetNestedDataSet();
        assert( ds83.Size() == 3 );
        const gdcm::PrivateTag tseq_values84name(0x7fe1,0x84,"GEMS_Ultrasound_MovieGroup_001");
        const gdcm::PrivateTag tseq_values85(0x7fe1,0x85,"GEMS_Ultrasound_MovieGroup_001");
        PrintNameValueMapping3( tseq_values84name, tseq_values85, ds83, sqi_dict, indent);
        std::cout << std::endl;
    }
    return true;
}

bool PrintNameValueMapping4( gdcm::PrivateTag const & privtag0, const gdcm::DataSet & subds, gdcm::PrivateTag
    const & privtag1, gdcm::PrivateTag const & privtag2,
    gdcm::SequenceOfItems *sqi_dict, std::string const & indent )
{
    (void)indent;
    if( !subds.FindDataElement( privtag0 ) )
    {
        assert( 0 );
        return false;
    }
    const gdcm::DataElement& seq_values10 = subds.GetDataElement( privtag0 );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values10 = seq_values10.GetValueAsSQ();
    size_t nil = sqi_values10->GetNumberOfItems();
    // assert( nil == 1 );
    for( size_t i1 = 1; i1 <= nil; ++i1 )
    {
        gdcm::Item &item_10 = sqi_values10->GetItem(i1);
        gdcm::DataSet &ds10 = item_10.GetNestedDataSet();
        assert( ds10.Size() == 2 + 3 );
        // (7fe1,0010)
        // (7fe1,1012)
        // (7fe1,1018)
        // (7fe1,1020)
        // (7fe1,1083)
        PrintNameValueMapping3( privtag1, privtag2, ds10, sqi_dict, " " );
        std::cout << std::endl;
        const gdcm::PrivateTag tseq_values20(0x7fe1,0x20,"GEMS_Ultrasound_MovieGroup_001");
        if( !ds10.FindDataElement( tseq_values20 ) )
        {
            assert( 0 );
            return false;
        }
        const gdcm::DataElement& seq_values20 = ds10.GetDataElement( tseq_values20 );
        gdcm::SmartPointer<gdcm::SequenceOfItems> sqi_values20 = seq_values20.GetValueAsSQ();
        size_t ni2 = sqi_values20->GetNumberOfItems();
        //assert( ni == 1 );
        for( size_t i2 = 1; i2 <= ni2; ++i2 )
        {
            gdcm::Item &item_20 = sqi_values20->GetItem(i2);
            gdcm::DataSet &ds20 = item_20.GetNestedDataSet();
            size_t count = ds20.Size(); (void)count;
            assert( ds20.Size() == 2 + 3 || ds20.Size() == 2 + 2 );
            // (7fe1,0010)
            // (7fe1,1024)
            // (7fe1,1026)
            // (7fe1,1036)
            // (7fe1,103a)
            // (7fe1,1083) (*)
            const gdcm::PrivateTag tseq_values20name(0x7fe1,0x24,"GEMS_Ultrasound_MovieGroup_001");

```

```

    const gdcm::PrivateTag tseq_values26(0x7fe1,0x26,"GEMS_Ultrasound_MovieGroup_001");
    PrintNameValueMapping3( tseq_values20name, tseq_values26, ds20, sqi_dict, "  ");
    std::cout << std::endl;
    print36(ds20, sqi_dict, "  ");
    print83(ds20, sqi_dict, "  ");
  }
  print83(ds10, sqi_dict, "  ");
}
return true;
}
int main(int argc, char *argv[])
{
  if( argc < 2 ) return 1;
  using namespace gdcm;
  const char *filename = argv[1];
  gdcm::Reader reader;
  reader.SetFileName( filename );
  if( !reader.Read() ) return 1;
  gdcm::File &file = reader.GetFile();
  gdcm::DataSet &ds = file.GetDataSet();
  const PrivateTag tseq(0x7fe1,0x1,"GEMS_Ultrasound_MovieGroup_001");
  if( !ds.FindDataElement( tseq ) ) return 1;
  const DataElement& seq = ds.GetDataElement( tseq );
  SmartPointer<SequenceOfItems> sqi = seq.GetValueAsSQ();
  assert( sqi->GetNumberOfItems() == 1 );
  Item &item = sqi->GetItem(1);
  DataSet &subds = item.GetNestedDataSet();
  const PrivateTag tseq_dict(0x7fe1,0x70,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq_dict ) ) return 1;
  const DataElement& seq_dict = subds.GetDataElement( tseq_dict );
  SmartPointer<SequenceOfItems> sqi_dict = seq_dict.GetValueAsSQ();
  const PrivateTag tseq_values8(0x7fe1,0x8,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq_values8 ) ) return 1;
  const DataElement& seq_values8 = subds.GetDataElement( tseq_values8 );
  SmartPointer<SequenceOfItems> sqi_values8 = seq_values8.GetValueAsSQ();
  const PrivateTag tseq_values8name(0x7fe1,0x2,"GEMS_Ultrasound_MovieGroup_001");
  if( !subds.FindDataElement( tseq_values8name ) ) return 1;
  const DataElement& values8name = subds.GetDataElement( tseq_values8name );
  {
    Element<VR::LO,VM::VM1> el;
    el.SetFromDataElement( values8name );
    std::cout << el.GetValue() << std::endl;
  }
  size_t count = subds.Size(); (void)count;
  assert( subds.Size() == 3 + 2 + 1 || subds.Size() == 3 + 2 + 2 );
  // (7fe1,0010) # 30,1 Private Creator
  // (7fe1,1002) # 8,1 US MovieGroup Value 0008 Name
  // (7fe1,1003) # 4,1 ?
  // (7fe1,1008) # 8140,1 US MovieGroup Value 0008 Sequence
  // (7fe1,1010) # 1372196,1 ?
  // (7fe1,1070) # 33684,1 US MovieGroup Dict
  // (7fe1,1073) (*)
  PrintNameValueMapping( sqi_values8, sqi_dict, "  ");
  const PrivateTag tseq_values10(0x7fe1,0x10,"GEMS_Ultrasound_MovieGroup_001");
  const PrivateTag tseq_values10name(0x7fe1,0x12,"GEMS_Ultrasound_MovieGroup_001");
  const PrivateTag tseq_values18(0x7fe1,0x18,"GEMS_Ultrasound_MovieGroup_001");
  PrintNameValueMapping4( tseq_values10, subds, tseq_values10name, tseq_values18, sqi_dict, "  ");
  print73( subds, sqi_dict, "  " );
  #if 0
  gdcm::DataSet::ConstIterator it = subds.Begin();
  for( ; it != subds.End(); ++it )
  {
    const gdcm::DataElement &de = *it;
    std::cout << de.GetTag() << std::endl;
  }
  #endif
  return 0;
}

```

## 12.52 DumpImageHeaderInfo.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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```



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```

=====*/
/*
 * Dump TOSHIBA MDW HEADER / Image Header Info
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <string.h>
#include <assert.h>
#include <stdint.h>
struct element
{
    std::istream & read( std::istream & is );
};
std::istream & element::read( std::istream & is )
{
    static const uint32_t ref = 0xe000ffff;
    std::ostream &os = std::cout;
    if( is.eof() )
    {
        return is;
    }
    uint32_t magic;
    if( !is.read( (char*)&magic, sizeof(magic) ) )
    {
        return is;
    }
    //os << magic << std::endl;
    assert( magic == ref ); (void)ref;
    uint32_t l;
    is.read( (char*)&l, sizeof(l) );
    //os << l << std::endl;
    char str[17];
    str[16] = 0;
    is.read( str, 16 );
    os << str << " (" << l << ")" << std::endl;
    std::vector<char> bytes;
    bytes.resize( l - 16 );
    if( !bytes.empty() )
    {
        is.read( &bytes[0], l - 16 );
    }
    //os << "pos:" << is.tellg() << std::endl;
    if( strcmp(str, "TUSREMEASUREMENT") == 0 )
    {
        const char *p = &bytes[0];
        uint32_t val;
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
    }
    #if 0
    float f;
    memcpy( (char*)&f, p, sizeof(f) );
    os << " " << f << std::endl;
    p += sizeof(f);
    #else

```

```

        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
#ifdefif
        memcpy( (char*)&val, p, sizeof(val) );
        os << " " << val << std::endl;
        p += sizeof(val);
        char str2[17];
        memcpy( str2, p, 16 );
        str2[16] = 0;
        os << " " << str2 << std::endl;
    }
#endif
    if 0
        std::ofstream out( str, std::ios::binary );
        out.write( (char*)&magic, sizeof( magic ) );
        out.write( (char*)&l, sizeof( l ) );
        out.write( str, 16 );
        out.write( &bytes[0], bytes.size() );
    #endif
    return is;
}

static bool DumpImageHeaderInfo( std::istream & is, size_t refln )
{
    // TUSNONIMAGESTAM (5176)
    // TUSREMEASUREMEN (1352)
    // TUSBSINGLELAYOU (16)
    // TUSCLIPPAREMTE (104)
    element el;
    while( el.read( is ) )
    {
    }
    //size_t pos = is.tellg();
    //assert( pos == refln );
    (void)refln;
    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    const gdcm::PrivateTag timageheaderinfo(0x0029,0x10,"TOSHIBA MDW HEADER");
    if( !ds.FindDataElement( timageheaderinfo ) ) return 1;
    const gdcm::DataElement& imageheaderinfo = ds.GetDataElement( timageheaderinfo );
    if ( imageheaderinfo.IsEmpty() ) return 1;
    const gdcm::ByteValue *bv = imageheaderinfo.GetByteValue();
    std::istreamstream is;
    std::string dup( bv->GetPointer(), bv->GetLength() );
    is.str( dup );
    bool b = DumpImageHeaderInfo( is, bv->GetLength() );
    if( !b ) return 1;
    if 0
        const float d1 = 0.00416666668839752674; // 89 88 88 3B // 0x44c
        //const float d1 = 0.053231674455417881;
        const float d2 = 0.10828025639057159; // 0A C2 DD 3D // 0x1ac
        //const float d1 = 0.17869562069272813;
        //const unsigned int d2 = 4294967280;
        const float d3 = 0.10828025639057159; // 0A C2 DD 3D // 0x15c
        const int32_t d4 = 134;
        const uint32_t d5 = 1153476;
        std::ofstream t("/tmp/debug", std::ios::binary );
        //t.write( (char*)&d0, sizeof( d0 ) );
        t.write( (char*)&d1, sizeof( d1 ) );
        t.write( (char*)&d2, sizeof( d2 ) );
        t.write( (char*)&d3, sizeof( d3 ) );
        t.write( (char*)&d4, sizeof( d4 ) );
        t.write( (char*)&d5, sizeof( d5 ) );
        t.close();
    #endif
    return 0;
}

```

## 12.53 DumpPhilipsECHO.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmDeflateStream.h"
#include "gdcm_zlib.h"
/*
 * This example extract the ZLIB compressed US image from a Philips private tag
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Usage:
 *
 * $ DumpPhilipsECHO private_us.dcm raw_us_img.raw
 * $ gdcnimg --sop-class-uid 1.2.840.10008.5.1.4.1.1.3.1 --size 608,427,88 raw_us_img.raw raw_us_img.dcm
 */
// header:
struct hframe
{
    uint32_t val0; // 800 increment ?
    uint16_t val1[2];
    uint16_t val2[2];
    uint32_t imgsize;
    bool operator==(const hframe &h) const
    {
        return val0 == h.val0 &&
            val1[0] == h.val1[0] &&
            val1[1] == h.val1[1] &&
            val2[0] == h.val2[0] &&
            val2[1] == h.val2[1] &&
            imgsize == h.imgsize;
    }
};
static bool ProcessDeflate( const char *outfilename, const int nslices, const
    int buf_size, const char *buf, const std::streampos len,
    const char *crdbuf, const size_t crclen )
{
    std::vector< hframe > crcheaders;
    crcheaders.reserve( nslices );
    {
        std::istringstream is;
        is.str( std::string( crdbuf, crclen ) );
        hframe header;
        for( int r = 0; r < nslices; ++r )
        {
            is.read( (char*)&header, sizeof( header ) );
            #if 0
                std::cout << header.val0
                    << " " << header.val1[0]
                    << " " << header.val1[1]
                    << " " << header.val2[0]
                    << " " << header.val2[1]
                    << " " << header.imgsize << std::endl;
            #endif
            crcheaders.push_back( header );
        }
    }
    std::istringstream is;
    is.str( std::string( buf, (size_t)len ) );
    std::streamoff totalsize;
    is.read( (char*)&totalsize, sizeof( totalsize ) );

```

```

assert( totalsize == len );
uint32_t nframes;
is.read( (char*)&nframes, sizeof( nframes ) );
assert( nframes == (uint32_t)nslices );
std::vector< std::streamoff > offsets;
offsets.reserve( nframes );
for( uint32_t frame = 0; frame < nframes ; ++frame )
{
    uint32_t offset;
    is.read( (char*)&offset, sizeof( offset ) );
    offsets.push_back( offset );
}
std::vector<char> outbuf;
const int size[2] = { 608, 427 }; // FIXME: where does it comes from ?
std::stringstream ss;
ss << outfilename;
ss << '_';
//ss << crchheaders[0].imgsize; // FIXME: Assume all header are identical !
ss << size[0];
ss << '_';
ss << size[1];
ss << '_';
ss << nframes;
ss << ".raw";
std::ofstream os( ss.str().c_str(), std::ios::binary );
assert( buf_size >= size[0] * size[1] );
outbuf.resize( buf_size );
hframe header;
//uint32_t prev = 0;
for( unsigned int r = 0; r < nframes; ++r )
{
    is.read( (char*)&header, sizeof( header ) );
    assert( header == crchheaders[r] );
    assert( header.val1[0] == 2000 );
    assert( header.val1[1] == 3 );
    assert( header.val2[0] == 1 );
    assert( header.val2[1] == 1280 );
    uLongf destLen = buf_size; // >= 608,427
    Bytef *dest = (Bytef*)&outbuf[0];
    assert( is.tellg() == offsets[r] + 16 );
    const Bytef *source = (const Bytef*)buf + offsets[r] + 16;
    uLong sourceLen;
    if( r + 1 == nframes )
        sourceLen = (uLong)totalsize - (uLong)offsets[r] - 16;
    else
        sourceLen = (uLong)offsets[r+1] - (uLong)offsets[r] - 16;
    // FIXME: in-memory decompression:
    int ret = uncompress( dest, &destLen, source, sourceLen );
    assert( ret == Z_OK ); (void)ret;
    assert( destLen >= (uLongf)size[0] * size[1] ); // 16bytes padding ?
    assert( header.imgsize == (uint32_t)size[0] * size[1] );
    //os.write( &outbuf[0], outbuf.size() );
    os.write( &outbuf[0], size[0] * size[1] );
    // skip data:
    is.seekg( sourceLen, std::ios::cur );
}
os.close();
assert( is.tellg() == totalsize );
return true;
}

static bool ProcessNone( const char *outfilename, const int nslices, const
    int buf_size, const char *buf, const std::streampos len,
    const char *crdbuf, const size_t crclen )
{
    std::vector< hframe > crchheaders;
    crchheaders.reserve( nslices );
    {
        std::istringstream is;
        is.str( std::string( crdbuf, crclen ) );
        hframe header;
        for( int r = 0; r < nslices; ++r )
        {
            is.read( (char*)&header, sizeof( header ) );
            #if 0
                std::cout << header.val0
                    << " " << header.val1[0]
                    << " " << header.val1[1]
                    << " " << header.val2[0]
                    << " " << header.val2[1]
                    << " " << header.imgsize << std::endl;
            #endif
        }
    }
}

```

```

        crcheaders.push_back( header );
    }
}
std::istream is;
is.str( std::string( buf, (size_t)len ) );
std::streampos totalsize;
is.read( (char*)&totalsize, sizeof( totalsize ) );
assert( totalsize == len );
uint32_t nframes;
is.read( (char*)&nframes, sizeof( nframes ) );
assert( nframes == (uint32_t)nslices );
std::vector< uint32_t > offsets;
offsets.reserve( nframes );
for( uint32_t frame = 0; frame < nframes ; ++frame )
{
    uint32_t offset;
    is.read( (char*)&offset, sizeof( offset ) );
    offsets.push_back( offset );
    //std::cout << offset << std::endl;
}
std::vector<char> outbuf;
// No idea how to present the data, I'll just append everything, and present it as 2D
std::stringstream ss;
ss << outfilename;
ss << '_';
ss << crcheaders[0].imgsize; // FIXME: Assume all header are identical !
ss << '_';
ss << nframes;
ss << ".raw";
std::ofstream os( ss.str().c_str(), std::ios::binary );
outbuf.resize( buf_size ); // overallocated + 16
char *buffer = &outbuf[0];
hframe header;
for( unsigned int r = 0; r < nframes; ++r )
{
    is.read( (char*)&header, sizeof( header ) );
}
#ifdef 0
    std::cout << header.val0
        << " " << header.val1[0]
        << " " << header.val1[1]
        << " " << header.val2[0]
        << " " << header.val2[1]
        << " " << header.imgsize << std::endl;
#endif
assert( header == crcheaders[r] );
is.read( buffer, buf_size - 16 );
os.write( buffer, header.imgsize );
}
assert( is.tellg() == totalsize );
os.close();
return true;
}
#ifndef NDEBUG
static const char * const UDM_USD_DATATYPE_STRINGS[] = {
    "UDM_USD_DATATYPE_DIN_2D_ECHO",
    "UDM_USD_DATATYPE_DIN_2D_ECHO_CONTRAST",
    "UDM_USD_DATATYPE_DIN_DOPPLER_CW",
    "UDM_USD_DATATYPE_DIN_DOPPLER_PW",
    "UDM_USD_DATATYPE_DIN_DOPPLER_PW_TDI",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_FLOW",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_PMI",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_CPA",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_TDI",
    "UDM_USD_DATATYPE_DIN_MMODE_ECHO",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR_TDI",
    "UDM_USD_DATATYPE_DIN_PARAM_BLOCK",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_VELOCITY",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_POWER",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_VARIANCE",
    "UDM_USD_DATATYPE_DIN_DOPPLER_AUDIO",
    "UDM_USD_DATATYPE_DIN_DOPPLER_HIGHQ",
    "UDM_USD_DATATYPE_DIN_PHYSIO",
    "UDM_USD_DATATYPE_DIN_2D_COLOR_STRAIN",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_RGB",
    "UDM_USD_DATATYPE_DIN_XFOV_REALTIME_GRAPHICS",
    "UDM_USD_DATATYPE_DIN_XFOV_MOSAIC",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_R",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_G",
    "UDM_USD_DATATYPE_DIN_COMPOSITE_B",
    "UDM_USD_DATATYPE_DIN_MMODE_COLOR_VELOCITY",

```

```

"UDM_USD_DATATYPE_DIN_MMODE_COLOR_POWER",
"UDM_USD_DATATYPE_DIN_MMODE_COLOR_VARIANCE",
"UDM_USD_DATATYPE_DIN_2D_ELASTO",
);
static inline bool is_valid( const char * datatype_str )
{
    static const int n = sizeof( UDM_USD_DATATYPE_STRINGS ) / sizeof( *UDM_USD_DATATYPE_STRINGS );
    bool found = false;
    if( datatype_str )
    {
        for( int i = 0; !found && i < n; ++i )
        {
            found = strcmp( datatype_str, UDM_USD_DATATYPE_STRINGS[i] ) == 0;
        }
    }
    return found;
}
#endif
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    using namespace gdcm;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() ) return 1;
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds1 = file.GetDataSet();
    const PrivateTag tseq1(0x200d,0x3cf8,"Philips US Imaging DD 045");
    if( !ds1.FindDataElement( tseq1 ) ) return 1;
    const DataElement& seq1 = ds1.GetDataElement( tseq1 );
    SmartPointer<SequenceOfItems> sq1 = seq1.GetValueAsSQ();
    assert( sq1->GetNumberOfItems() >= 1 );
    const size_t nitems = sq1->GetNumberOfItems();
    for( size_t item = 1; item < nitems; ++item )
    {
        Item &item1 = sq1->GetItem(item);
        DataSet &ds2 = item1.GetNestedDataSet();
        // (200d,300d) LO 28 UDM_USD_DATATYPE_DIN_2D_ECHO
        const PrivateTag tdatatype(0x200d,0x300d,"Philips US Imaging DD 033");
        if( !ds2.FindDataElement( tdatatype ) ) return 1;
        const DataElement& datatype = ds2.GetDataElement( tdatatype );
        const ByteValue *bvdatatype = datatype.GetByteValue();
        if( !bvdatatype ) return 1;
        const PrivateTag tseq2(0x200d,0x3cf1,"Philips US Imaging DD 045");
        if( !ds2.FindDataElement( tseq2 ) ) return 1;
        const DataElement& seq2 = ds2.GetDataElement( tseq2 );
        SmartPointer<SequenceOfItems> sq2 = seq2.GetValueAsSQ();
        assert( sq2->GetNumberOfItems() >= 1 );
        // FIXME: what if not in first Item ?
        assert( sq2->GetNumberOfItems() == 1 );
        Item &item2 = sq2->GetItem(1);
        DataSet &ds3 = item2.GetNestedDataSet();
        const PrivateTag tzlib(0x200d,0x3cfa,"Philips US Imaging DD 045");
        if( !ds3.FindDataElement( tzlib ) ) return 1;
        const DataElement& zlib = ds3.GetDataElement( tzlib );
        const ByteValue *bv = zlib.GetByteValue();
        if( !bv ) return 1;
        if( bv->GetLength() != 4 ) return 1;
        // (200d,3010) IS 2 88
        const PrivateTag tnslices(0x200d,0x3010,"Philips US Imaging DD 033");
        if( !ds3.FindDataElement( tnslices ) ) return 1;
        const DataElement& nslices = ds3.GetDataElement( tnslices );
        Element<VR::IS,VM::VM1> elnslices;
        elnslices.SetFromDataElement( nslices );
        const int nslicesref = elnslices.GetValue();
        assert( nslicesref >= 0 );
        // (200d,3011) IS 6 259648
        const PrivateTag tzalloc(0x200d,0x3011,"Philips US Imaging DD 033");
        if( !ds3.FindDataElement( tzalloc ) ) return 1;
        const DataElement& zalloc = ds3.GetDataElement( tzalloc );
        Element<VR::IS,VM::VM1> elzalloc;
        elzalloc.SetFromDataElement( zalloc );
        const int zallocref = elzalloc.GetValue();
        assert( zallocref >= 0 );
        // (200d,3021) IS 2 0
        const PrivateTag tzzero(0x200d,0x3021,"Philips US Imaging DD 033");
        if( !ds3.FindDataElement( tzzero ) ) return 1;
        const DataElement& zero = ds3.GetDataElement( tzzero );
        Element<VR::IS,VM::VM1> elzero;
        elzero.SetFromDataElement( zero );
    }
}

```

```

const int zerocref = elzero.GetValue();
assert( zerocref == 0 ); (void)zerocref;
// (200d,3cf3) OB
const PrivateTag tdeflate(0x200d,0x3cf3,"Philips US Imaging DD 045");
if( !ds3.FindDataElement( tdeflate ) ) return 1;
const DataElement& deflate = ds3.GetDataElement( tdeflate );
const ByteValue *bv2 = deflate.GetByteValue();
// (200d,3cfb) OB
const PrivateTag tcrc(0x200d,0x3cfb,"Philips US Imaging DD 045");
if( !ds3.FindDataElement( tcrc ) ) return 1;
const DataElement& crc = ds3.GetDataElement( tcrc );
const ByteValue *bv3 = crc.GetByteValue();
std::string outfile = std::string( bvdatatype->GetPointer(), bvdatatype->GetLength() );
outfile = LOComp::Trim( outfile.c_str() );
const char *outfilename = outfile.c_str();
assert( is_valid(outfilename) );
if( bv2 )
{
    assert( bv3 );
    assert( zallocref > 0 );
    assert( nslicesref > 0 );
    std::cout << ds2 << std::endl;
    if( strncmp(bv->GetPointer(), "ZLib", 4) == 0 )
    {
        if( !ProcessDeflate( outfile, nslicesref, zallocref, bv2->GetPointer(),
            std::streampos( bv2->GetLength() ), bv3->GetPointer(), bv3->GetLength() ) )
        {
            return 1;
        }
    }
    else if( strncmp(bv->GetPointer(), "None", 4) == 0 )
    {
        if( !ProcessNone( outfile, nslicesref, zallocref, bv2->GetPointer(),
            std::streampos( bv2->GetLength() ), bv3->GetPointer(), bv3->GetLength() ) )
        {
            return 1;
        }
    }
    else
    {
        std::string str( bv->GetPointer(), bv->GetLength() );
        std::cerr << "Unhandled: " << str << std::endl;
        return 1;
    }
}
return 0;
}

```

## 12.54 DumpSiemensBase64.cxx

/\*=====

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=====\*/

/\*

\* <https://groups.google.com/forum/#!msg/comp.protocols.dicom/2kZ21LP8EcM/WzjFrtjnAgAJ>

\*/

```

#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"
#include "gdcmCSAHeader.h"
#include "gdcmBase64.h"
#include "gdcmExplicitDataElement.h"
#include "gdcmSwapper.h"
#include "gdcmPrinter.h"
#include <iostream>

```

```

#include <fstream>
#include <vector>
#include <assert.h>
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    gdcm::CSAHeader csa;
    const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
    if( !ds.FindDataElement( t1 ) ) return 1;
    csa.LoadFromDataElement( ds.GetDataElement( t1 ) );
    //const char name[] = "MRDiffusion";
    const char name[] = "MR_AS_L";
    if( csa.FindCSAElementByName( name ) )
    {
        const gdcm::CSAElement &el = csa.GetCSAElementByName( name );
        const gdcm::ByteValue* bv = el.GetByteValue();
        std::string str( bv->GetPointer(), bv->GetLength() );
        str.erase( std::remove( str.begin(), str.end(), '\n' ), str.end() );
        size_t dl = gdcm::Base64::GetDecodeLength( str.c_str(), str.size() );
        std::vector<char> buf;
        buf.resize( dl );
        size_t dl2 = gdcm::Base64::Decode( &buf[0], buf.size(), str.c_str(), str.size() );
        (void)dl2;
        std::stringstream ss;
        ss.str( std::string( &buf[0], buf.size() ) );
        gdcm::File file;
        gdcm::DataSet &ds2 = file.GetDataSet();
        gdcm::DataElement xde;
        try
        {
            while( xde.Read<gdcm::ExplicitDataElement, gdcm::SwapperNoOp>( ss ) )
            {
                ds2.Insert( xde );
            }
            assert( ss.eof() );
        }
        catch( std::exception & )
        {
            return 1;
        }
        gdcm::Printer p;
        p.SetFile( file );
        p.Print( std::cout );
    }
    return 0;
}

```

## 12.55 DumpToSQLITE3.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
* Ref:
* http://massmail.spl.harvard.edu/public-archives/slicer-devel/2010/004408.html
*
* Implementation details:
* http://www.sqlite.org/c3ref/bind_blob.html

```



```

* http://www.adp-gmbh.ch/sqlite/bind_insert.html
*/
#include "gdcmScanner.h"
#include "gdcmDirectory.h"
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "sqlite3.h"
#include <stdio.h>
#include <time.h>
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    time_t time_start = time(nullptr);
    gdcm::Trace::SetDebug( false );
    gdcm::Trace::SetWarning( false );
    const char *inputdirectory = argv[1];
    gdcm::Directory d;
    unsigned int nfiles = d.Load( inputdirectory, true);
    gdcm::Scanner s;
    using gdcm::Tag;
    s.AddTag( Tag(0x20,0xd) ); // Study Instance UID
    s.AddTag( Tag(0x20,0xe) ); // Series Instance UID
    bool b0 = s.Scan( d.GetFileNames() );
    if( !b0 ) return 1;
    time_t time_scanner = time(nullptr);
    std::cout << "Finished loading data from : " << nfiles << " files" << std::endl;
    // MappingType const &mappings = s.GetMappings();
    sqlite3* db;
    sqlite3_open("../dicom.db", &db);
    if(db == nullptr)
    {
        std::cerr << "Could not open database." << std::endl;
        return 1;
    }
    const char sql_stmt[] = "create table browser (seriesuid, studyuid)";
    int ret;
    char *errmsg;
    ret = sqlite3_exec(db, sql_stmt, nullptr, nullptr, &errmsg);
    if(ret != SQLITE_OK)
    {
        printf("Error in statement: %s [%s].\n", sql_stmt, errmsg);
        return 1;
    }
    using gdcm::Directory;
    using gdcm::Scanner;
    const Directory::FileNamesType& files = d.GetFileNames();
    Directory::FileNamesType::const_iterator file = files.begin();
    sqlite3_stmt *stmt;
    if ( sqlite3_prepare(
        db,
        "insert into browser values (?,?)", // stmt
        -1, // If than zero, then stmt is read up to the first nul terminator
        &stmt,
        nullptr // Pointer to unused portion of stmt
    )
    != SQLITE_OK)
    {
        printf("\nCould not prepare statement.");
        return 1;
    }
    //printf("\nThe statement has %d wildcards\n", sqlite3_bind_parameter_count(stmt));
    for(; file != files.end(); ++file)
    {
        const char *filename = file->c_str();
        bool b = s.IsKey(filename);
        if( b )
        {
            const Scanner::TagToValue &mapping = s.GetMapping(filename);
            Scanner::TagToValue::const_iterator it = mapping.begin();
            sqlite3_reset(stmt);
            for( int index = 1; it != mapping.end(); ++it, ++index)
            {
                //const Tag &tag = it->first;
                const char *value = it->second;
                if (sqlite3_bind_text (
                    stmt,
                    index, // Index of wildcard
                    value,

```

```

        (int)strlen(value), // length of text
        SQLITE_STATIC // SQLite assumes that the information is in static
    )
    != SQLITE_OK)
    {
        printf("\nCould not bind int.\n");
        return 1;
    }
}
if (sqlite3_step(stmt) != SQLITE_DONE)
{
    printf("\nCould not step (execute) stmt.\n");
    return 1;
}
}
}
sqlite3_close(db);
time_t time_sqlite = time(nullptr);
std::cout << "Time to scan DICOM files: " << (time_scanner - time_start) << std::endl;
std::cout << "Time to build SQLITE3: " << (time_sqlite - time_scanner) << std::endl;
return 0;
}

```

## 12.56 DumpToshibaDTI.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * https://groups.google.com/d/msg/comp.protocols.dicom/7IaIkT0ZG5U/k7LPu81VvAMJ
 */
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrinter.h"
#include "gdcmDictPrinter.h"
#include <iostream>
#include <fstream>
#include <vector>
#include <assert.h>
static bool DumpToshibaDTI( const char * input, size_t len )
{
    static int i = 0;
    ++i;
    if( len % 2 ) return false;
    std::vector<char> copy( input, input + len );
    std::reverse( copy.begin(), copy.end() );
    #if 0
    std::ostringstream f;
    f << "debug" << i;
    std::ofstream of( f.str().c_str(), std::ios::binary );
    of.write( &copy[0], copy.size() );
    of.close();
    #else
    std::istringstream is;
    std::string dup( &copy[0], copy.size() );
    is.str( dup );
    gdcm::File file;
    gdcm::FileMetaInformation & fmi = file.GetHeader();
    fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
    gdcm::DataSet & ds = file.GetDataSet();
    ds.Read<gdcm::ExplicitDataElement, gdcm::SwapperNoOp>( is );
    //gdcm::DictPrinter p;
    gdcm::Printer p;
    p.SetFile( file );
    p.SetColor( true );
    p.Print( std::cout );
    #endif
}

```

```

    return true;
}
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    // (0029,0010) ?? (LO) [PMTF INFORMATION DATA ] # 22,1 Private Creator
    // (0029,1001) ?? (SQ) (Sequence with undefined length) # u/1,1 ?
    const gdcm::PrivateTag tpmtf(0x0029,0x1,"PMTF INFORMATION DATA");
    if( !ds.FindDataElement( tpmtf ) ) return 1;
    const gdcm::DataElement& pmtf = ds.GetDataElement( tpmtf );
    if ( pmtf.IsEmpty() ) return 1;
    gdcm::SmartPointer<gdcm::SequenceOfItems> seq = pmtf.GetValueAsSQ();
    if ( !seq || !seq->GetNumberOfItems() ) return 1;
    size_t n = seq->GetNumberOfItems();
    for( size_t i = 1; i <= n; ++i )
    {
        gdcm::Item &item = seq->GetItem(i);
        gdcm::DataSet &subds = item.GetNestedDataSet();
        // (0029,0010) ?? (LO) [PMTF INFORMATION DATA ] # 22,1 Private Creator
        // (0029,1090) ?? (OB) 00\05\00\13\00\12\00\22\ # 202,1 ?
        const gdcm::PrivateTag tseq(0x0029,0x90,"PMTF INFORMATION DATA");
        if( subds.FindDataElement( tseq ) )
        {
            const gdcm::DataElement &de = subds.GetDataElement( tseq );
            const gdcm::ByteValue *bv = de.GetByteValue();
            if( !bv ) return 1;
            bool b = DumpToshibaDTI( bv->GetPointer(), bv->GetLength() );
            if( !b ) return 1;
        }
    }
    return 0;
}

```

## 12.57 DumpToshibaDTI2.cxx

```

/*=====

```

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```

=====*/

```

```

/*

```

```

*

```

```

    https://gazelle.ihe.net/EVSCClient/dicomResult.seam;jsessionId=x+Rf9Zs+ip49P+jC3L8SLZb8?oid=1.3.6.1.4.1.12559.11.1.2.1.4.16

```

```

*/

```

```

#include "gdcmReader.h"

```

```

#include "gdcmPrivateTag.h"

```

```

#include "gdcmPrinter.h"

```

```

#include "gdcmDictPrinter.h"

```

```

#include <iostream>

```

```

#include <fstream>

```

```

#include <vector>

```

```

#include <assert.h>

```

```

static bool DumpToshibaDTI2( const char * input, size_t len )

```

```

{

```

```

    static int i = 0;

```

```

    ++i;

```

```

    if( len % 2 ) return false;

```

```

    std::vector<char> copy( input, input + len );

```

```

    std::reverse( copy.begin(), copy.end() );

```

```

    #if 0

```

```

std::ostream f;
f << "debug" << i;
std::ofstream of( f.str().c_str(), std::ios::binary );
of.write( &copy[0], copy.size() );
of.close();
#else
std::istream is;
std::string dup( &copy[0], copy.size() );
is.str( dup );
gdcmm::File file;
gdcmm::FileMetaInformation & fmi = file.GetHeader();
fmi.SetDataSetTransferSyntax( gdcmm::TransferSyntax::ExplicitVRLittleEndian );
gdcmm::DataSet & ds = file.GetDataSet();
ds.Read<gdcmm::ExplicitDataElement, gdcmm::SwapperNoOp>( is );
//gdcmm::DictPrinter p;
gdcmm::Printer p;
p.SetFile( file );
p.SetColor( true );
p.Print( std::cout );
#endif
return true;
}
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcmm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcmm::DataSet& ds = reader.GetFile().GetDataSet();
    /*
(0029,1001) SQ (Sequence with explicit length #=6)          # 18746, 1 Unknown Tag & Data
(fffe,e000) na (Item with explicit length #=2)             # 206, 1 Item
(0029,0010) LO [TOSHIBA_MEC_MR3]                          # 16, 1 PrivateCreator
(0029,1090) OB 00\07\00\06\00\05\00\04\00\03\00\02\00\0c\00\01\00\00\00\00\00\12... # 170, 1 Unknown Tag & Data
(fffe,e00d) na (ItemDelimitationItem for re-encoding)     # 0, 0 ItemDelimitationItem
(fffe,e000) na (Item with explicit length #=2)            # 866, 1 Item
(0029,0010) LO [TOSHIBA_MEC_MR3]                          # 16, 1 PrivateCreator
(0029,1090) OB 45\4e\49\50\53\4c\20\52\41\5c\45\4e\49\50\53\4c\54\5c\52\45\53\55... # 830, 1 Unknown Tag & Data
[...]
(0029,1002) SQ (Sequence with explicit length #=1)        # 120, 1 Unknown Tag & Data
(fffe,e000) na (Item with explicit length #=2)            # 112, 1 Item
(0029,0010) LO [TOSHIBA_MEC_MR3]                          # 16, 1 PrivateCreator
(0029,1090) OB 00\10\00\02\53\55\10\80\70\0d\30\31\5e\33\52\4d\5f\43\45\4d\5f\41... # 76, 1 Unknown Tag & Data
(fffe,e00d) na (ItemDelimitationItem for re-encoding)     # 0, 0 ItemDelimitationItem
*/
    const gdcmm::PrivateTag tmecmr3(0x0029,0x1,"TOSHIBA_MEC_MR3");
    if( !ds.FindDataElement( tmecmr3 ) ) return 1;
    const gdcmm::DataElement& mecmr3 = ds.GetDataElement( tmecmr3 );
    if ( mecmr3.IsEmpty() ) return 1;
    gdcmm::SmartPointer<gdcmm::SequenceOfItems> seq = mecmr3.GetValueAsSQ();
    if ( !seq || !seq->GetNumberOfItems() ) return 1;
    size_t n = seq->GetNumberOfItems();
    for( size_t i = 1; i <= n; ++i )
    {
        gdcmm::Item &item = seq->GetItem(i);
        gdcmm::DataSet &subds = item.GetNestedDataSet();
        const gdcmm::PrivateTag tseq(0x0029,0x90,"TOSHIBA_MEC_MR3");
        if( subds.FindDataElement( tseq ) )
        {
            const gdcmm::DataElement &de = subds.GetDataElement( tseq );
            const gdcmm::ByteValue *bv = de.GetByteValue();
            if( !bv ) return 1;
            bool b = DumpToshibaDTI2( bv->GetPointer(), bv->GetLength() );
            if( !b ) return 1;
        }
    }
    return 0;
}

```

## 12.58 DumpVisusChange.cxx

```

/*=====

```

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```

=====*/
#include "gdcmReader.h"
#include "gdcmDirectory.h"
#include "gdcmStringFilter.h"
#include <vector>
#include <algorithm>
/*
*/
static bool process( std::vector<gdcm::DataElement> & ms, const char * filename)
{
    using namespace gdcm;
    Tag pd(0x7fe0,0x0000);
    std::set<gdcm::Tag> skiptags;
    skiptags.insert( pd );
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.ReadUpToTag( pd, skiptags ) )
    {
        std::cerr << "Failure to read: " << filename << std::endl;
        return false;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds1 = file.GetDataSet();
    const gdcm::PrivateTag tseq1(0x5533,0x33,"Visus Change");
    if( !ds1.FindDataElement( tseq1 ) ) return true;
    const gdcm::DataElement& seq1 = ds1.GetDataElement( tseq1 );
    SmartPointer<SequenceOfItems> sq1 = seq1.GetValueAsSQ();
    const size_t nitems = sq1->GetNumberOfItems();
    for( size_t item = 1; item < nitems; ++item )
    {
        Item &item1 = sq1->GetItem(item);
        DataSet &ds2 = item1.GetNestedDataSet();
        for(DataSet::ConstIterator it = ds2.Begin(); it != ds2.End(); ++it )
        {
            DataElement const & de = *it;
            // cannot simply use std::set here, see there is a discrepancy in between
            // operator== and operator<.
            // So only use operator== here:
            std::vector<DataElement>::iterator vit = std::find(ms.begin(), ms.end(), de);
            if( vit == ms.end() )
                ms.push_back(de);
        }
    }
    return true;
}

int main(int argc, char *argv[])
{
    bool usefastpath = true;
    if( argc < 2 ) return 1;
    using namespace gdcm;
    const char *filename = argv[1];
    gdcm::Directory::FilenamesType filenames;
    if( !gdcm::System::FileExists(filename) )
    {
        std::cerr << "Could not find file: " << filename << std::endl;
        return 1;
    }
    gdcm::Directory dir;
    if( gdcm::System::FileIsDirectory(filename) )
    {
        unsigned int nfiles = dir.Load(filename, false);
        if( nfiles == 0 )
        {
            std::cerr << "Could not find files: " << filename << std::endl;
            return 1;
        }
        filenames = dir.GetFilenames();
    }
    else
    {

```

```

    filenames.push_back( filename );
}
gdcmm::StringFilter sf;
Tag pd(0x7fe0,0x0000);
std::set<gdcmm::Tag> skiptags;
skiptags.insert( pd );
gdcmm::Reader reader;
reader.SetFileName( filenames[0].c_str() );
if( !reader.ReadUpToTag( pd, skiptags ) )
{
    std::cerr << "Could not read file: " << filename << std::endl;
    return 1;
}
gdcmm::File &file = reader.GetFile();
sf.SetFile(file);
if( usefastpath ) {
    // Heuristic, assume if private tag cannot be found in first file, skip the directory
    gdcmm::DataSet &ds1 = file.GetDataSet();
    const gdcmm::PrivateTag tseq1(0x5533,0x33,"Visus Change");
    if( !ds1.FindDataElement( tseq1 ) ){
        std::cerr << "Could not find private tag in first file skipping whole directory: " << filename << std::endl;
        return 0;
    }
}
std::vector<DataElement> ms;
for(gdcmm::Directory::FileNamesType::const_iterator cit = filenames.begin(); cit != filenames.end(); ++cit )
{
    if( !process(ms, cit->c_str()) ) {
        return 1;
    }
}
if( !ms.empty() ) {
    std::sort(ms.begin(), ms.end());
    std::cout << filename << ",\n";
    for(std::vector<DataElement>::const_iterator it = ms.begin(); it != ms.end(); ++it )
    {
        DataElement const & de = *it;
        std::string const & s = sf.ToString( de );
        std::cout << de.GetTag() << " " << s << std::endl;
    }
    std::cout << "\n" << std::endl;
}
return 0;
}

```

## 12.59 DuplicatePCDE.cxx

```

/*=====
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=====*/
#include "gdcmmReader.h"
#include "gdcmmWriter.h"
#include "gdcmmItem.h"
#include "gdcmmImageReader.h"
#include "gdcmmSequenceOfItems.h"
#include "gdcmmFile.h"
#include "gdcmmTag.h"
/*
Usage:
DuplicatePCDE gdcmmData/D_CLUNIE_CT1_J2KI.dcm out.dcm

aka:
medical.nema.org/medical/dicom/DataSets/WG04/IMAGES/J2KI/CT1_J2KI

See:
gdcmmConformanceTests/CT1_J2KI_DuplicatePCDE.dcm

```

Original thread can be found at:

[http://groups.google.com/group/comp.protocols.dicom/browse\\_thread/thread/82f28c4db28963af](http://groups.google.com/group/comp.protocols.dicom/browse_thread/thread/82f28c4db28963af)

Question:

1.  
There is no restriction for a specific Private Creator Data Element (PCDE) to be unique within the same group, right ?  
Decoders of Private Data would have to handle the case where a PCDE would be repeated and should NOT stop on the first instance of a particular PCDE, right ?

Eg. when searching for the tag associated with (0x0029,0x0010,"SIEMENS CSA HEADER") in the following (pseudo) dataset:

```
(0029,0010) LO [SIEMENS CSA HEADER] # 18, 1
PrivateCreator
(0029,0011) LO [SIEMENS MEDCOM HEADER] # 22, 1
PrivateCreator
(0029,0012) LO [SIEMENS MEDCOM HEADER2] # 22, 1
PrivateCreator
(0029,0013) LO [SIEMENS CSA HEADER] # 18, 1
PrivateCreator
(0029,1008) CS [IMAGE NUM 4] # 12, 1
CSAImageHeaderType
(0029,1009) LO [20050723] # 8, 1
CSAImageHeaderVersion
(0029,1010) OB 53\56\31\30\04\03\02\01\38\00\00\00\4d
\00\00\00\45\63\68\6f\4c\69... # 6788, 1 CSAImageHeaderInfo
(0029,1018) CS [MR] # 2, 1
CSASeriesHeaderType
(0029,1019) LO [20050723] # 8, 1
CSASeriesHeaderVersion
(0029,1020) OB 53\56\31\30\04\03\02\01\2c\00\00\00\4d
\00\00\00\55\73\65\64\50\61... # 51520, 1 CSASeriesHeaderInfo
(0029,1131) LO [4.0.163088300] # 14, 1
PMTFInformation1
(0029,1132) UL 32768 # 4, 1
PMTFInformation2
(0029,1133) UL 0 # 4, 1
PMTFInformation3
(0029,1134) CS [DB TO DICOM] # 12, 1
PMTFInformation4
(0029,1260) ?? 63\6f\6d\20 # 4, 1
Unknown Tag & Data
(0029,1310) OB 53\56\31\30\04\03\02\01\38\00\00\00\4d
\00\00\00\45\63\68\6f\4c\69... # 6788, 1 CSAImageHeaderInfo
```

one should return two instances, correct ?

Answer:

I would say that this is covered in principle by the PS 3.5 7.1 "The Data Elements ... shall occur at most once in a Data Set" rule, since the data element is defined by the tuple (private creator,gggg,ee) where xxee is the element number and xx is arbitrary and has no inherent meaning and does not serve to disambiguate the data element.

E.g.:

```
(0019,0030) Private Creator ID = "Smith"
...
(0019,0032) Private Creator ID = "Smith"
...
(0019,3015) Fractal Index = "32"
...
(0019,3215) Fractal Index = "32"
```

would be illegal because even though they are assigned different (completely arbitrary) blocks, with the same group, element number and private creator, (0019,3015) and (0019,3215) are the "same" data element.

```
*/
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
    }
}
```

```

        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    // Let's get all private element from group 0x9:
    /*
    (0009,0010) LO [GEMS_IDEN_01] # 12,1 Private Creator
    (0009,1001) LO [GE_GENESIS_FF ] # 14,1 Full fidelity
    (0009,1002) SH [CT01] # 4,1 Suite id
    (0009,1004) SH [HiSpeed CT/i] # 12,1 Product id
    (0009,1027) SL 862399669 # 4,1 Image actual date
    (0009,1030) SH (no value) # 0,1 Service id
    (0009,1031) SH (no value) # 0,1 Mobile location number
    (0009,10e6) SH [05] # 2,1 Genesis Version - now
    (0009,10e7) UL 973283917 # 4,1 Exam Record checksum
    (0009,10e9) SL 862399669 # 4,1 Actual series data time stamp
    */
    gdcm::Tag start(0x0009,0x0);
    // Create a temporary duplicate dataset, since we cannot insert data element as we go over them (std::set
    // would reorganize itself as we go over it ...)
    gdcm::DataSet dup;
    gdcm::Tag new_private(0x0009,0x0);
    while (start.GetGroup() == 0x9 )
    {
        const gdcm::DataElement& de = ds.FindNextDataElement(start);
        const gdcm::Tag &t = de.GetTag();
        if( t.IsPrivateCreator() )
        {
            std::cout << t << std::endl;
            // Ok let's duplicate into the next available attribute:
            gdcm::DataElement duplicate = de;
            duplicate.GetTag().SetElement( (uint16_t)(t.GetElement() + 1) );
            dup.Insert( duplicate );
            new_private = duplicate.GetTag();
        }
        else if( t.IsPrivate() && !t.IsPrivateCreator() )
        {
            //std::cout << de << std::endl;
            std::string owner = ds.GetPrivateCreator( de.GetTag() );
            //std::cout << owner << std::endl;
            gdcm::DataElement duplicate = de;
            duplicate.GetTag().SetPrivateCreator( new_private );
            if( const gdcm::ByteValue *bv = duplicate.GetByteValue() )
            {
                // Warning: when doing : duplicate = de, only the pointer to the ByteValue is passed
                // (to avoid large memory duplicate). We need to explicitly duplicate the bytevalue ourselves:
                gdcm::ByteValue *dupbv = new gdcm::ByteValue( bv->GetPointer(),
                    bv->GetLength() );
                // Let's recognize the duplicated ASCII-type elements:
                if( duplicate.GetVR() & gdcm::VR::VRASCII )
                {
                    dupbv->Fill( 'X' );
                    duplicate.SetValue( *dupbv );
                }
            }
            dup.Insert( duplicate );
        }
        start = t;
        // move to next possible 'public' element
        start.SetElement( (uint16_t)(start.GetElement() + 1) );
    }
    gdcm::DataSet::ConstIterator it = dup.Begin();
    for( ; it != dup.End(); ++it )
    {
        ds.Insert( *it );
    }
    gdcm::Writer w;
    w.SetFile( file );
    w.SetFileName( outfile );
    if ( !w.Write() )
    {
        return 1;
    }
    return 0;
}

```



## 12.60 ELSCINT1WaveToText.cxx

```

Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE.  See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
/*
 * This example shows how to read a Wave Information tag from ELSCINT1
 * The wave information is stored in Tag (01e1,18,ELSCINT1) hidden in a
 * Secondary Capture Image Storage (usually a 'N' Symbol is shown)
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 *
 * Everything you do with this code is at your own risk, since decompression
 * algorithm was not written from specification documents.
 *
 * Special thanks to:
 * Gauthier Bouilhol
 */
template <typename T>
bool dumpargs(std::ostream & os, T c1, T c2, T c3, T c4, T c5, T c6, T c7, T c8)
{
    static const char sep = '\t';
    os << c1 << sep << c2 << sep << c3 << sep << c4 << sep << c5 << sep << c6 << sep << c7 << sep << c8;
    os << std::endl;
    return true;
}

bool wave2stream( std::ostream &text_file, const char *in, size_t len )
{
    const short * buffer = (const short*)in;
    size_t length = len / sizeof( short );
    text_file << "COMPLETE_WAVE" << '\t' << "MASK" << '\t' << "AQUISITION_PROFIL" << '\t' << "END-INHALE" << '\t' <<
    "END-EXHALE" << '\t' << "AQUISITION_WAVE" << '\t' << "WAVE_STATISTICS" << '\t' << "MASK" << std::endl;
    for (size_t i=0;i<length-76;i+=2)
    {
        if ( i < 74 )
        {
            if (buffer[i+75] == 0)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " << '\t' << buffer[i+1] <<
                '\t' << " " << '\t' << " " << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == 16384)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << buffer[i+74] <<
                '\t' << " " << '\t' << " " << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == 256)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 0 << '\t' << " " << '\t' << " " <<
                '\t' << buffer[i+74] << '\t' << " " << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == -32768)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " << '\t' << " " <<
                '\t' << buffer[i+74] << '\t' << buffer[i+75] << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == -16384)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << buffer[i+74] <<
                '\t' << " " << '\t' << buffer[i+74] << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
            if (buffer[i+75] == -32512)
                text_file << buffer[i+74] << '\t' << buffer[i+75] << '\t' << 1 << '\t' << " " << '\t' << " " <<
                '\t' << buffer[i+74] << '\t' << buffer[i+74] << '\t' << buffer[i] << '\t' << buffer[i+1] <<
                std::endl;
        }
        else
        {
            if (buffer[i+75] == 0)

```



```

if( argc < 3 ) return 1;
inputdir = argv[1];
outputdir = argv[2];
// input_sopclassuid -> Use original SOP Class UID from input DICOM (Default).
// grayscale_secondary_sopclassuid -> Use Grayscale Secondary Image Storage SOP Class UID.
if( argc >= 3 )
{
    input_sopclassuid = false;
    if( strcmp("input_sopclassuid", argv[3]) == 0 )
        input_sopclassuid = true;
    else if ( strcmp("grayscale_secondary_sopclassuid", argv[3]) == 0 ) {
        grayscale_secondary_sopclassuid = true;
    }
}
//
gdcm::EmptyMaskGenerator emg;
if( input_sopclassuid )
    emg.SetSOPClassUIDMode( gdcm::EmptyMaskGenerator::UseOriginalSOPClassUID );
else if( grayscale_secondary_sopclassuid )
    emg.SetSOPClassUIDMode( gdcm::EmptyMaskGenerator::UseGrayscaleSecondaryImageStorage );
emg.SetInputDirectory( inputdir.c_str() );
emg.SetOutputDirectory( outputdir.c_str() );
if( !emg.Execute() )
{
    return 1;
}
return 0;
}

```

## 12.62 EncapsulateFileInRawData.cxx

```

/*=====

```

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```

=====*/

```

```

#include "gdcmAnonymizer.h"
#include "gdcmWriter.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmSystem.h"
#include "magic.h" // libmagic, API to file command line tool
/*
 * Let say you want to encapsulate a file type that is not defined in DICOM (exe, zip, png)
 * PNG is a bad example, unless it contains transparency (which has been deprecated).
 * It will take care of dispatching each chunk to an appropriate data item (pretty much like
 * WaveformData)
 *
 * Usage:
 * ./EncapsulateFileInRawData large_input_file.exe large_input_file.dcm
 */
// TODO:
// $ file -bi /tmp/gdcm-2.1.0.pdf
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " inputfile output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    if( !gdcm::System::FileExists( filename ) ) return 1;
    size_t s = gdcm::System::FileSize(filename);
    if( !s ) return 1;
    magic_t cookie = magic_open(MAGIC_NONE);
    const char * file_type = magic_file(cookie, filename);
    if( !file_type ) return 1;
}

```

```

magic_close(cookie);
gdcm::Writer w;
gdcm::File &file = w.GetFile();
//gdcm::DataSet &ds = file.GetDataSet();
//w.SetCheckFileMetaInformation( true );
w.SetFileName( outfilename );
file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
gdcm::Anonymizer anon;
anon.SetFile( file );
gdcm::MediaStorage ms = gdcm::MediaStorage::RawDataStorage;
gdcm::UIDGenerator gen;
anon.Replace( gdcm::Tag(0x0008,0x16), ms.GetString() );
std::cout << ms.GetString() << std::endl;
anon.Replace( gdcm::Tag(0x0008,0x18), gen.Generate() );
if ( !w.Write() )
{
    std::cerr << "Could not write: " << outfilename << std::endl;
    return 1;
}
return 0;
}

```

## 12.63 ExtractEncryptedContent.cxx

```

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=====*/
#include "gdcmReader.h"
#include <fstream>
/*

openssl smime -encrypt -binary -aes256 -in outputfile.dcm -inform DER -out outputfile.der -outform DER
../trunk/Testing/Source/Data/certificate.pem

openssl smime -decrypt -binary -in out.der -inform DER -out outputfile.dcm -outform DER -inkey
../trunk/Testing/Source/Data/privatekey.pem ../trunk/Testing/Source/Data/certificate.pem

*/
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.der" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    const gdcm::DataElement &EncryptedAttributesSequence = ds.GetDataElement( gdcm::Tag( 0x0400,0x0500 ) );
    gdcm::SequenceOfItems *sqi = EncryptedAttributesSequence.GetValueAsSQ();
    if ( !sqi || sqi->GetNumberOfItems() != 1 ) return 1;
    gdcm::Item &item = sqi->GetItem(1);
    gdcm::DataSet &nestedds = item.GetNestedDataSet();
    if( ! nestedds.FindDataElement( gdcm::Tag( 0x0400,0x0520 ) ) ) return 1;
    const gdcm::DataElement &EncryptedContent = nestedds.GetDataElement( gdcm::Tag( 0x0400,0x0520 ) );
    const gdcm::ByteValue *bv = EncryptedContent.GetByteValue();
    std::ofstream of( outfilename, std::ios::binary );
    of.write( bv->GetPointer(), bv->GetLength() );
    of.close();
    return 0;
}

```

## 12.64 ExtractIconFromFile.cxx

```

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=====*/
/*
 * This example shows how to either retrieve an Icon if present somewhere
 * in the file, or else generate one.
 */
#include "gdcmImageReader.h"
#include "gdcmPNMCodec.h"
#include "gdcmIconImageFilter.h"
#include "gdcmIconImageGenerator.h"
bool WriteIconAsPNM(const char* filename, const gdcm::IconImage& icon)
{
    gdcm::PNMCodec pnm;
    pnm.SetDimensions( icon.GetDimensions() );
    pnm.SetPixelFormat( icon.GetPixelFormat() );
    pnm.SetPhotometricInterpretation( icon.GetPhotometricInterpretation() );
    pnm.SetLUT( icon.GetLUT() );
    const gdcm::DataElement& in = icon.GetDataElement();
    bool b = pnm.Write( filename, in );
    assert( b );
    return b;
}

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read (or not image): " << filename << std::endl;
        return 1;
    }
    gdcm::IconImageFilter iif;
    iif.SetFile( reader.GetFile() );
    bool b = iif.Extract();
    if( b )
    {
        const gdcm::IconImage &icon = iif.GetIconImage(0);
        icon.Print( std::cout );
        if( !icon.GetTransferSyntax().IsEncapsulated() )
        {
            // Let's write out this icon as PNM file
            WriteIconAsPNM("icon.ppm", icon);
        }
        else if( icon.GetTransferSyntax() == gdcm::TransferSyntax::JPEGBaselineProcess1
        || icon.GetTransferSyntax() == gdcm::TransferSyntax::JPEGExtendedProcess2_4
        )
        {
            const gdcm::DataElement& in = icon.GetDataElement();
            const gdcm::ByteValue *bv = in.GetByteValue();
            assert( bv );
            std::ofstream out( "icon.jpg", std::ios::binary );
            out.write( bv->GetPointer(), bv->GetLength() );
            out.close();
        }
    }
    else
    {
        assert( iif.GetNumberOfIconImages() == 0 );
        std::cerr << "No Icon Found anywhere in file" << std::endl;
        const gdcm::Image &img = reader.GetImage();
        gdcm::IconImageGenerator iig;
        iig.AutoPixelMinMax(true);
        iig.SetPixmap( img );
        const unsigned int idims[2] = { 64, 64 };
        iig.SetOutputDimensions( idims );
    }
}

```

```

        //iig.SetPixelMinMax(60, 868);
        if( !iig.Generate() ) return 1;
        const gdcm::IconImage & icon = iig.GetIconImage();
        WriteIconAsPNM("icon.ppm", icon);
    }
    return 0;
}

```

## 12.65 Extracting\_All\_Resolution.cxx

```

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PURPOSE.  See the above copyright notice for more information.

=====*/
// This work was realised during the GSOC 2011 by Manoj Alwani
#include <fstream>
#include <stdint.h>
#include <string.h>
#include <assert.h>
#include <gdcm_j2k.h>
#include <gdcm_jp2.h>
#include <iostream>
#include <cstring>
#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <math.h>
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmSystem.h"
#include <fstream>
#include "gdcm_openjpeg.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmImageHelper.h"
#include "gdcmTrace.h"
void error_callback(const char *msg, void *) {
    (void)msg;
}
void warning_callback(const char *msg, void *) {
    (void)msg;
}
void info_callback(const char *msg, void *) {
    (void)msg;
}
bool Write_Resolution(gdcm::StreamImageWriter & theStreamWriter, const char *filename, int res, std::ostream&
    of, int flag, gdcm::SequenceOfItems *sq, int No_Of_Resolutions)
{
    std::ifstream is;
    is.open( filename, std::ios::binary );
    opj_dparameters_t parameters; /* decompression parameters */
    opj_event_mgr_t event_mgr; /* event manager */
    opj_dinfo_t* dinfo; /* handle to a decompressor */
    opj_cio_t *cio;
    opj_image_t *image = NULL;
    // FIXME: Do some stupid work:
    is.seekg( 0, std::ios::end);
    std::streampos buf_size = is.tellg();
    char *dummy_buffer = new char[(unsigned int)buf_size];

```

```

is.seekg(0, std::ios::beg);
is.read( dummy_buffer, buf_size);
unsigned char *src = (unsigned char*)dummy_buffer;
uint32_t file_length = (uint32_t)buf_size; // 32bits truncation should be ok since DICOM cannot have larger
    than 2Gb image
/* configure the event callbacks (not required) */
memset(&event_mgr, 0, sizeof(opj_event_mgr_t));
event_mgr.error_handler = error_callback;
event_mgr.warning_handler = warning_callback;
event_mgr.info_handler = info_callback;
/* set decoding parameters to default values */
opj_set_default_decoder_parameters(&parameters);
// default blindly copied
parameters.cp_layer=0;
parameters.cp_reduce= res;
// parameters.decod_format=-1;
// parameters.cod_format=-1;
const char jp2magic[] = "\x00\x00\x00\x0C\x6A\x50\x20\x20\x0D\x0A\x87\x0A";
if( memcmp( src, jp2magic, sizeof(jp2magic) ) == 0 )
{
    /* JPEG-2000 compressed image data ... sigh */
    // gdcmData/ELSCINT1_JP2vsJ2K.dcm
    // gdcmData/MAROTECHE_CT_JP2Lossy.dcm
    //gdcmWarningMacro( "J2K start like JPEG-2000 compressed image data instead of codestream" );
    parameters.decod_format = 1; //JP2_CFMT;
    //assert(parameters.decod_format == JP2_CFMT);
}
else
{
    /* JPEG-2000 codestream */
    //parameters.decod_format = J2K_CFMT;
    //assert(parameters.decod_format == J2K_CFMT);
    assert( 0 );
}
parameters.cod_format = 11; // PGX_DFMT;
//assert(parameters.cod_format == PGX_DFMT);
/* get a decoder handle */
dinfo = opj_create_decompress(CODEC_JP2);
/* catch events using our callbacks and give a local context */
opj_set_event_mgr((opj_common_ptr)dinfo, &event_mgr, NULL);
/* setup the decoder decoding parameters using user parameters */
opj_setup_decoder(dinfo, &parameters);
/* open a byte stream */
cio = opj_cio_open((opj_common_ptr)dinfo, src, file_length);
/* decode the stream and fill the image structure */
image = opj_decode(dinfo, cio);
if(!image) {
    opj_destroy_decompress(dinfo);
    opj_cio_close(cio);
    //gdcmErrorMacro( "opj_decode failed" );
    return 1;
}

    opj_cp_t * cp = ((opj_jp2_t*)dinfo->jp2_handle)->j2k->cp;
    opj_tcp_t *tcp = &cp->tcps[0];
    opj_tccp_t *tccp = &tcp->tccps[0];
    /* std::cout << "\n No of Cols In Image" << image->x1;
    std::cout << "\n No of Rows In Image" << image->y1;
    std::cout << "\n No of Components in Image" << image->numcomps;
    std::cout << "\n No of Resolutions" << tccp->numresolutions << "\n";
    */

    opj_j2k_t* j2k = NULL;
    opj_jp2_t* jp2 = NULL;
    jp2 = (opj_jp2_t*)dinfo->jp2_handle;
    int reversible = jp2->j2k->cp->tcps->tccps->qmfbid;
    //std::cout << reversible;
    int compno = 0;
    opj_image_comp_t *comp = &image->comps[compno];
    int Dimensions[2];
    Dimensions[0]= comp->w;
    Dimensions[1] = comp->h;
    opj_cio_close(cio);
    unsigned long len = Dimensions[0]*Dimensions[1] * image->numcomps;
    //std::cout << "\nTest" <<image->comps[0].factor;
    char *raw = new char[len];
    for (unsigned int compno = 0; compno < (unsigned int)image->numcomps; compno++)
    {
        opj_image_comp_t *comp = &image->comps[compno];
        int w = image->comps[compno].w;
        int h = image->comps[compno].h;
        uint8_t *data8 = (uint8_t*)raw + compno;
        for (int i = 0; i < w * h ; i++)

```

```

        {
            int v = image->comps[compno].data[i];
            *data8 = (uint8_t)v;
            data8 += image->numcomps;
        }
    }
    gdcm::Writer w;
    gdcm::File &file = w.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
    gdcm::UIDGenerator uid;
    gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
    de.SetVR( gdcm::VR::UI );
    const char *u = uid.Generate();
    de.SetByteValue( u, strlen(u) );
    ds.Insert( de );
    gdcm::DataElement del( gdcm::Tag(0x8,0x16) );
    del.SetVR( gdcm::VR::UI );
    gdcm::MediaStorage ms( gdcm::MediaStorage::CTImageStorage );
    del.SetByteValue( ms.GetString(), strlen(ms.GetString()) );
    ds.Insert( del );
    const char mystr[] = "MONOCHROME2 ";
    gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
    //de.SetTag(gdcm::Tag(0x28,0x04));
    de2.SetVR( gdcm::VR::CS );
    de2.SetByteValue(mystr, strlen(mystr));
    ds.Insert( de2 );
    gdcm::Attribute<0x0028,0x0010> row = {image->comps[0].w};
    //row.SetValue(512);
    ds.Insert( row.GetAsDataElement() );
    // w.SetCheckFileMetaInformation( true );
    gdcm::Attribute<0x0028,0x0011> col = {image->comps[0].h};
    ds.Insert( col.GetAsDataElement() );
    gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
    ds.Insert( Number_Of_Frames.GetAsDataElement() );
    gdcm::Attribute<0x0028,0x0100> at = {8};
    ds.Insert( at.GetAsDataElement() );
    gdcm::Attribute<0x0028,0x0002> at1 = {image->numcomps};
    ds.Insert( at1.GetAsDataElement() );
    gdcm::Attribute<0x0028,0x0101> at2 = {8};
    ds.Insert( at2.GetAsDataElement() );
    gdcm::Attribute<0x0028,0x0102> at3 = {7};
    ds.Insert( at3.GetAsDataElement() );
    if (flag == 1)
    {
        for (int i=0; i < No_Of_Resolutions; i++)
        {
            int a = 1;
            int b = 1;
            while(a!==(No_Of_Resolutions)-i))
            {
                b = b*2;
                a = a+1;
            }
            uint16_t row = (image->y1)/b;
            uint16_t col = (image->x1)/b;
            //std::cout << row;
            gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el2;
            el2.SetValue(i+1);
            gdcm::DataElement rfn = el2.GetAsDataElement(); //ulr --> upper left row
            rfn.SetTag( gdcm::Tag(0x0008,0x1160) );
            gdcm::Element<gdcm::VR::US, gdcm::VM::VM2> el;
            el.SetValue(1,0);
            el.SetValue(1,1);
            gdcm::DataElement ulr = el.GetAsDataElement(); //ulr --> upper left col/row
            ulr.SetTag( gdcm::Tag(0x0048,0x0201) );
            gdcm::Element<gdcm::VR::US, gdcm::VM::VM2> el1;
            el1.SetValue(col,0);
            el1.SetValue(row,1);
            gdcm::DataElement brr = el1.GetAsDataElement();
            brr.SetTag( gdcm::Tag(0x0048,0x0202) ); //brr --> bottom right col/row
            gdcm::Item it;
            gdcm::DataSet &nds = it.GetNestedDataSet();
            nds.Insert( rfn );
            nds.Insert( ulr );
            nds.Insert( brr );
            sq->AddItem(it);
        }
    }
    gdcm::Writer w1;
    gdcm::File &file1 = w1.GetFile();
    gdcm::DataSet &ds1 = file1.GetDataSet();

```



```

file1.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
gdcm::UIDGenerator uid1;
gdcm::DataElement dea( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
dea.SetVR( gdcm::VR::UI );
const char *ul = uid1.Generate();
dea.SetByteValue( ul, strlen(ul) );
ds1.Insert( dea );
gdcm::DataElement deb( gdcm::Tag(0x8,0x16) );
deb.SetVR( gdcm::VR::UI );
gdcm::MediaStorage ms1( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
deb.SetByteValue( ms1.GetString(), strlen(ms1.GetString()) );
ds1.Insert( deb );
const char mystr1[] = "MONOCHROME2 ";
gdcm::DataElement dec( gdcm::Tag(0x28,0x04) );
//de.SetTag(gdcm::Tag(0x28,0x04));
dec.SetVR( gdcm::VR::CS );
dec.SetByteValue( mystr, strlen(mystr1) );
ds1.Insert( dec );
gdcm::Attribute<0x0028,0x0010> row1 = {image->y1};
//row.SetValue(512);
ds1.Insert( row1.GetAsDataElement() );
// w.SetCheckFileMetaInformation( true );
gdcm::Attribute<0x0028,0x0011> col1 = {image->x1};
ds1.Insert( col1.GetAsDataElement() );
gdcm::Attribute<0x0028,0x0008> Number_Of_Frames1 = {tccp->numresolutions};
ds1.Insert( Number_Of_Frames1.GetAsDataElement() );
gdcm::Attribute<0x0028,0x0100> ata = {8};
ds1.Insert( ata.GetAsDataElement() );
gdcm::Attribute<0x0028,0x0002> atb = {image->numcomps};
ds1.Insert( atb.GetAsDataElement() );
gdcm::Attribute<0x0028,0x0101> atc = {8};
ds1.Insert( atc.GetAsDataElement() );
gdcm::Attribute<0x0028,0x0102> atd = {7};
ds1.Insert( atd.GetAsDataElement() );
theStreamWriter.SetFile(file1);
gdcm::DataElement des( gdcm::Tag(0x0048,0x0200) );
des.SetVR(gdcm::VR::SQ);
//des.SetVR(gdcm::VM::VM1);
des.SetValue(*sq);
des.SetVLToUndefined();
ds1.Insert(des);
if (!theStreamWriter.WriteImageInformation()){
    std::cerr << "unable to write image information" << std::endl;
    return 1; //the CanWrite function should prevent getting here, else,
    //that's a test failure
}
theStreamWriter.SetFile(file);
if (!theStreamWriter.CanWriteFile()){
    delete [] raw;
    std::cout << "Not able to write";
    return 0; //this means that the file was unwritable, period.
    //very similar to a ReadImageInformation failure
}
else
    std::cout<<"\nabletoread";
// Important to write here
std::vector<unsigned int> extent = gdcm::ImageHelper::GetDimensionsValue(file);
unsigned short xmax = extent[0];
unsigned short ymax = extent[1];
unsigned short theChunkSize = 4;
unsigned short ychunk = extent[1]/theChunkSize; //go in chunk sizes of theChunkSize
unsigned short zmax = extent[2];
std::cout << "\n" << xmax << "\n" << ymax << "\n" << zmax << "\n" << image->numcomps << "\n";
if (xmax == 0 || ymax == 0)
{
    std::cerr << "Image has no size, unable to write zero-sized image." << std::endl;
    return 0;
}
int z, y, nexty;
unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
//the bytes sequentially. So, store how far you got in the buffer with each iteration.
for (z = 0; z < zmax; ++z){
    for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout << "\n" << len;
        char* finalBuffer = new char[len];
        memcpy(finalBuffer, &(raw[prevLen]), len);
    }
}

```

```

        std::cout << "\nable to write";
        if (!theStreamWriter.Write(finalBuffer, len)){
            std::cerr << "writing failure:" << "output.dcm" << " at y = " << y << " and z = " << z << std::endl;
            delete [] raw;
            delete [] finalBuffer;
            return 1;
        }
        delete [] finalBuffer;
        prevLen += len;
    }
    delete raw;
    delete[] src; //FIXME
if(dinfo) {
    opj_destroy_decompress(dinfo);
}
opj_image_destroy(image);
return true;
}
bool Different_Resolution( gdcm::StreamImageWriter & theStreamWriter, const char *filename, int res,
    std::ostream& of)
{
    //std::vector<std::string>::const_iterator it = filenames.begin();
    bool b = true;
    int flag = 1;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();
    for(int i = res-1 ; i>=0; --i)
    {
        b = b && Write_Resolution( theStreamWriter, filename, i, of ,flag,sq,res);
        // b = b && Get_Resolution( theStreamWriter, filename, i, of ,0);
        flag = 0;
    }
    //b = b && Get_Lowest_Resolution( writer, sq, filename, res-1 );
    //b = b && PopulateSingeFile( writer, sq, jpeg, filename2 );
    //image.SetDimension(2, res )
    return b;
}
int main(int argc, char *argv[])
{
    if( argc < 4 )
    {
        std::cerr << argv[0] << " input.jp2 output.dcm No. Of Resolutions " << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    char *resolutions = argv[3];
    int res = int((*resolutions)-48);
    //std:: cout << "\nres"<< res;
    gdcm::StreamImageWriter theStreamWriter;
    std::ofstream of;
    of.open( outfile, std::ios::out | std::ios::binary );
    theStreamWriter.SetStream(of);
    if( !Different_Resolution( theStreamWriter, filename,res,of ) ) return 1;
    uint16_t firstTag1 = 0xfffe;
    uint16_t secondTag1 = 0xe0dd;
    uint32_t thirdTag1 = 0x00000000;
    //uint16_t fourthTag1 = 0xffff;
    const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
    char* tmpBuffer2 = new char[theBufferSize1];
    memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
    memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
    memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
    //memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
    assert( of && !of.eof() && of.good() );
    of.write(tmpBuffer2, theBufferSize1);
    of.flush();
    assert( of );
    return 0;
}

```

## 12.66 Fake\_Image\_Using\_Stream\_Image\_Writer.cxx

```

/*=====

```

```

Program:  GDCM (Grassroots DICOM). A DICOM library

```

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 the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR  
 PURPOSE. See the above copyright notice for more information.

```

=====*/
// This work was realised during the GSOC 2011 by Manoj Alwani
#include "gdcmReader.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmAttribute.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmAnonymizer.h"
#include "gdcmStreamImageWriter.h"
#include "gdcmImageHelper.h"
#include "gdcmTrace.h"
int main(int, char *[])
{
    char * buffer = new char[ 256 * 256 *3 ];
    // *p = (uint8_t*)buffer;
    char * p = buffer;
    gdcm::Trace::DebugOn();
    gdcm::Trace::WarningOn();
    for(int row = 0; row < 256; ++row)
    {
        for(int col = 0; col < 256; ++col)
            //for(int b = 0; b < 256; ++b)
            {
                *p++ = 255;
                *p++ = 0;
                *p++ = 0;
            }
        gdcm::Writer w;
        gdcm::File &file = w.GetFile();
        gdcm::DataSet &ds = file.GetDataSet();
        file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
        gdcm::UIDGenerator uid;
        gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
        de.SetVR( gdcm::VR::UI );
        const char *u = uid.Generate();
        de.SetByteValue( u, strlen(u) );
        ds.Insert( de );
        gdcm::DataElement del( gdcm::Tag(0x8,0x16) );
        del.SetVR( gdcm::VR::UI );
        gdcm::MediaStorage ms( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
        del.SetByteValue( ms.GetString(), strlen(ms.GetString()) );
        ds.Insert( del );
        const char mystr[] = "RGB";
        gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
        //de.SetTag(gdcm::Tag(0x28,0x04));
        de2.SetVR( gdcm::VR::CS );
        de2.SetByteValue( mystr, strlen(mystr) );
        ds.Insert( de2 );
        gdcm::Attribute<0x0028,0x0010> row = {256};
        //row.SetValue(512);
        ds.Insert( row.GetAsDataElement() );
        // w.SetCheckFileMetaInformation( true );
        gdcm::Attribute<0x0028,0x0011> col = {256};
        ds.Insert( col.GetAsDataElement() );
        gdcm::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
        ds.Insert( Number_Of_Frames.GetAsDataElement() );
        gdcm::Attribute<0x0028,0x0100> at = {8};
        ds.Insert( at.GetAsDataElement() );
        gdcm::Attribute<0x0028,0x0002> at1 = {3}; //bits per pixel
        ds.Insert( at1.GetAsDataElement() );
        gdcm::Attribute<0x0028,0x0101> at2 = {8};
        ds.Insert( at2.GetAsDataElement() );
        gdcm::Attribute<0x0028,0x0102> at3 = {7};
        ds.Insert( at3.GetAsDataElement() );
        gdcm::Attribute<0x0028,0x0006> at4 = {0};
        ds.Insert( at4.GetAsDataElement() );
    }
}

```

```

gdcM::Attribute<0x0028,0x0103> at5 = {0};
ds.Insert( at5.GetAsDataElement() );
//de.SetTag(gdcM::Tag(0x7fe0,0x0010));
//ds.Insert(de);
gdcM::StreamImageWriter theStreamWriter;
gdcM::SmartPointer<gdcM::SequenceOfItems> sq = new gdcM::SequenceOfItems();
sq->SetLengthToUndefined();
uint16_t row1 = 256;
uint16_t col1 = 256;
//std::cout << row;
gdcM::Element<gdcM::VR::IS,gdcM::VM::VM1> el2;
el2.SetValue(1);
gdcM::DataElement rfn = el2.GetAsDataElement(); //rfn ---> reference frame number
rfn.SetTag( gdcM::Tag(0x0008,0x1160) );
gdcM::Element<gdcM::VR::US,gdcM::VM::VM2> el;
el.SetValue(1,0);
el.SetValue(1,1);
gdcM::DataElement ulr = el.GetAsDataElement(); //ulr --> upper left col/row
ulr.SetTag( gdcM::Tag(0x0048,0x0201) );
gdcM::Element<gdcM::VR::US,gdcM::VM::VM2> ell;
ell.SetValue(col1,0);
ell.SetValue(row1,1);
gdcM::DataElement brr = ell.GetAsDataElement();
brr.SetTag( gdcM::Tag(0x0048,0x0202) ); //brr --> bottom right col/row
gdcM::Item it;
gdcM::DataSet &nds = it.GetNestedDataSet();
nds.Insert( rfn );
nds.Insert( ulr );
nds.Insert( brr );
sq->AddItem(it);
gdcM::DataElement des( gdcM::Tag(0x0048,0x0200) );
des.SetVR(gdcM::VR::SQ);
des.SetValue(*sq);
des.SetVLToUndefined();
ds.Insert( des );
theStreamWriter.SetFile(file);
std::ofstream of;
of.open( "output.dcm", std::ios::out | std::ios::binary );
theStreamWriter.SetStream(of);
if (!theStreamWriter.CanWriteFile()){
    delete [] buffer;
    std::cout << "Not able to write";
    return 0; //this means that the file was unwritable, period.
    //very similar to a ReadImageInformation failure
}
else
    std::cout<<"\nbletoread";
if (!theStreamWriter.WriteImageInformation()){
    std::cerr << "unable to write image information" << std::endl;
    delete [] buffer;
    return 1; //the CanWrite function should prevent getting here, else,
    //that's a test failure
}
std::vector<unsigned int> extent =
    gdcM::ImageHelper::GetDimensionsValue(file);
unsigned short xmax = extent[0];
unsigned short ymax = extent[1];
unsigned short theChunkSize = 1;
unsigned short ychunk = extent[1]/theChunkSize; //go in chunk sizes of theChunkSize
unsigned short zmax = extent[2];
std::cout << xmax << ymax << zmax;
if (xmax == 0 || ymax == 0)
{
    std::cerr << "Image has no size, unable to write zero-sized image." << std::endl;
    return 0;
}
int z, y, nexty;
unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
//the bytes sequentially. So, store how far you got in the buffer with each iteration.
for (z = 0; z < zmax; ++z){
    for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout << "\n" << len;
        char* finalBuffer = new char[len];
        memcpy(finalBuffer, &(buffer[prevLen]), len);
        std::cout << "\n" << "able to write";
        if (!theStreamWriter.Write(finalBuffer, len)){
            std::cerr << "writing failure:" << "output.dcm" << " at y = " << y << " and z = " << z << std::endl;

```

```

        delete [] buffer;
        delete [] finalBuffer;
        return 1;
    }
    delete [] finalBuffer;
    prevLen += len;
}
}
delete buffer;
uint16_t firstTag1 = 0xfffe;
uint16_t secondTag1 = 0xe0dd;
uint32_t thirdTag1 = 0x00000000;
//uint16_t fourthTag1 = 0xffff;
const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
char* tmpBuffer2 = new char[theBufferSize1];
memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
//memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
assert( of && !of.eof() && of.good() );
of.write(tmpBuffer2, theBufferSize1);
of.flush();
assert( of );
return 0;
}

```

## 12.67 FixBrokenJ2K.cxx

/\*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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=====\*/

```

#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmFile.h"
// http://www.lost.in.ua/dicom/c.dcm
//
// -> BuggyJ2Kvvua-fixed2-j2k.dcm
/*
 * This program attempts to fix a broken J2K/DICOM:
 * It contains 2 bugs:
 * 1. The first 8 bytes seems to be random bytes: remove them
 * 2. YCC is set to 1, while image is grayscale need to set it back to 0
 *
 * Ref:
 * It's a software from http://rentgenprom.ru/ , shipped with universal digital radiographic units
 * "ProScan-2000". The Ukrainian manufacturer developed own digital radiographic unit and it is
 * compatible with software from "ProScan-2000".
 * Information found in DICOM file is:
 *
 * (0008,0070) LO [ZAO "Renthenprom" (JSC Rentgenprom) ]          # 36,1 Manufacturer
 * (0018,1020) LO [2.13.1.7]                                       # 8,1-n Software Version(s)
 *
 */
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )

```

```

    {
        return 1;
    }
    gdcmm::File &file = reader.GetFile();
    const gdcmm::DataElement &pixeldata0 = file.GetDataSet().GetDataElement( gdcmm::Tag(0x7fe0,0x0010) );
    const gdcmm::SequenceOfFragments *sqf = pixeldata0.GetSequenceOfFragments();
    if( !sqf )
    {
        return 1;
    }
    const gdcmm::Fragment &frag0 = sqf->GetFragment(0);
    gdcmm::ByteValue *bv = const_cast<gdcmm::ByteValue*>(frag0.GetByteValue());
    char *ptr = (char*)bv->GetVoidPointer();
    size_t len = bv->GetLength();
    static const unsigned char sig[] = {0,0,0,0,0x6A,0x70,0x32,0x63};
    if( memcmp(ptr, sig, sizeof(sig)) != 0 )
    {
        std::cerr << "magic random signature not found" << std::endl;
        return 1;
    }
    // Apparently the flag to enable a color transform on 3 color components is set in
    // the COD marker. (YCC is byte[6] in the COD marker)
    // we need to disable this flag;
    char *cod_marker = ptr + 0x35; /* 0x2d + 0x8 */ // FIXME
    if( cod_marker[0] == (char)0xff && cod_marker[1] == 0x52 )
    {
        // found start of COD
        if( cod_marker[6+2] == 1 )
        {
            // Change in place:
            *((char*)cod_marker + 6+2) = 0;
            // Prepare a new DataElement:
            gdcmm::DataElement pixeldata( gdcmm::Tag(0x7fe0,0x0010) );
            pixeldata.SetVR( gdcmm::VR::OB );
            gdcmm::SmartPointer<gdcmm::SequenceOfFragments> sq = new gdcmm::SequenceOfFragments;
            gdcmm::Fragment frag;
            // remove 8 first bytes:
            frag.SetByteValue( ptr + 8, (uint32_t)(len - 8) );
            sq->AddFragment( frag );
            pixeldata.SetValue( *sq );
            file.GetDataSet().Replace( pixeldata );
        }
        else
        {
            return 1;
        }
    }
    else
    {
        std::cerr << "COD not found" << (int)cod_marker[0] << std::endl;
        return 1;
    }
    gdcmm::Writer writer;
    writer.SetFile( reader.GetFile() );
    writer.SetFileName( outfilename );
    writer.CheckFileMetaInformationOff();
    if( !writer.Write() )
    {
        std::cerr << "Could not write" << std::endl;
    }
    // paranoid check:
    gdcmm::ImageReader ireader;
    ireader.SetFileName( outfilename );
    if( !ireader.Read() )
    {
        std::cerr << "file written is still not valid, please report" << std::endl;
        return 1;
    }
    return 0;
}

```

## 12.68 FixJAIBugJPEGLS.cxx

```

/*=====

```

```

Program:  GDCM (Grassroots DICOM). A DICOM library

```

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 PURPOSE. See the above copyright notice for more information.

```

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmImageReader.h"
#include <fstream>
#include "gdcm_charls.h"
/*
 * This small example should show how one can handle the famous JAI-JPEGLS bug
 * It will take in as invalid DICOM/JAI-JPEG-LS and write out as Explicit Little
 * Endian. One can use 'gdcmconv --jpegls' to recompress properly
 *
 * References:
 * http://charls.codeplex.com/discussions/230307?ProjectName=charls
 * http://charls.codeplex.com/workitem/7297
 * http://www.dcm4che.org/jira/browse/DCM-442
 * http://www.dcm4che.org/jira/browse/DCMEE-1144
 * http://java.net/jira/browse/JAI_IMAGEIO_CORE-183
 *
 * Explanation of the issue:
 *
 * Seems, the error is in the calculation of the default values for thresholds T1,
 * T2, T3, in particular min(MAXVAL, 4095) is not applied in
 *
 * FACTOR = (min(MAXVAL, 4095) + 128) / 256
 *
 * as specified in http://www.itu.int/rec/T-REC-T.87-199806-I/en .
 */
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::FileMetaInformation::SetSourceApplicationEntityTitle( "FixJAIBugJPEGLS" );
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }
    gdcm::Image &image = reader.GetImage();
    //unsigned long len = image.GetBufferLength();
    const gdcm::DataElement &in =
        reader.GetFile().GetDataSet().GetDataElement( gdcm::Tag(0x7fe0,0x0010) );
    const gdcm::SequenceOfFragments *sf = in.GetSequenceOfFragments();
    if( !sf )
    {
        std::cerr << "No pixel data (or not encapsulated)" << std::endl;
        return 1;
    }
    const unsigned int *dims = image.GetDimensions();
    if ( sf->GetNumberOfFragments() != dims[2] )
    {
        std::cerr << "Unsupported" << std::endl;
        return 1;
    }
    // unsigned long totalLen = sf->ComputeByteLength();
    std::vector<unsigned char> rgbyteOutall;
    for(unsigned int i = 0; i < sf->GetNumberOfFragments(); ++i)
    {
        const gdcm::Fragment &frag = sf->GetFragment(i);
        if( frag.IsEmpty() ) return 1;
        const gdcm::ByteValue *bv = frag.GetByteValue();
        if( !bv ) return 1;
        unsigned long totalLen = bv->GetLength();
        std::vector<char> vbuffer;
        vbuffer.resize( totalLen );
        char *buffer = &vbuffer[0];
        bv->GetBuffer(buffer, totalLen);
    }
}

```

```

const unsigned char* pbyteCompressed0 = (const unsigned char*)buffer;
while( totalLen > 0 && pbyteCompressed0[totalLen-1] != 0xd9 )
{
    totalLen--;
}
JlsParameters metadata;
char errorMsg[256+1]={'\0'};
if (JpegLsReadHeader(buffer, totalLen, &metadata, errorMsg) != charls::ApiResult::OK)
{
    std::cerr << "Cant parse jpegls: " << errorMsg << std::endl;
    return 1;
}
std::cout << metadata.width << std::endl;
std::cout << metadata.height << std::endl;
std::cout << metadata.bitsPerSample << std::endl;
gdcm::PixelFormat const & pf = image.GetPixelFormat();
std::cout << pf << std::endl;
// http://charls.codeplex.com/discussions/230307?ProjectName=charls
unsigned char marker_lse_13[] = {
    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0x1F, 0xFF,
    0x00, 0x22, // T1 = 34
    0x00, 0x83, // T2 = 131
    0x02, 0x24, // T3 = 548
    0x00, 0x40
};
unsigned char marker_lse_14[] = {
    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0x3F, 0xFF,
    0x00, 0x42, // T1 = 66
    0x01, 0x03, // T2 = 259
    0x04, 0x44, // T3 = 1092
    0x00, 0x40
};
unsigned char marker_lse_15[] = {
    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0x7F, 0xFF,
    0x00, 0x82, // T1 = 130
    0x02, 0x03, // T2 = 515
    0x08, 0x84, // T3 = 2180
    0x00, 0x40
};
unsigned char marker_lse_16[] = {
    0xFF, 0xF8, 0x00, 0x0D,
    0x01,
    0xFF, 0xFF,
    0x01, 0x02, // T1 = 258
    0x04, 0x03, // T2 = 1027
    0x11, 0x04, // T3 = 4356
    0x00, 0x40
};
const unsigned char *marker_lse = nullptr;
switch( metadata.bitsPerSample )
{
    case 13:
        marker_lse = marker_lse_13;
        break;
    case 14:
        marker_lse = marker_lse_14;
        break;
    case 15:
        marker_lse = marker_lse_15;
        break;
    case 16:
        marker_lse = marker_lse_16;
        break;
}
if( !marker_lse )
{
    std::cerr << "Cant handle: " << metadata.bitsPerSample << std::endl;
    return 1;
}
// FIXME: One should recompute the value for 0x0F
vbuffer.insert( vbuffer.begin() + 0x0F, marker_lse, marker_lse+15);
#if 0
std::ofstream of( "tmp/d.jls", std::ios::binary );
of.write( &vbuffer[0], vbuffer.size() );
of.close();

```



```

#endif
const char *pbyteCompressed = &vbuffer[0];
size_t cbyteCompressed = vbuffer.size(); // updated legnth
JlsParameters params;
JpegLsReadHeader(pbyteCompressed, cbyteCompressed, &params, nullptr);
std::vector<unsigned char> rgbyteOut;
//rgbyteOut.resize( image.GetBufferLength() );
rgbyteOut.resize(params.height *params.width * ((params.bitsPerSample + 7)
/ 8) * params.components);
CharlsApiResultType result =
JpegLsDecode(&rgbyteOut[0], rgbyteOut.size(), pbyteCompressed, cbyteCompressed, &params, errorMsg );
if (result != charls::ApiResult::OK)
{
std::cerr << "Could not patch JAI-JPEGLS: " << errorMsg << std::endl;
return 1;
}
rgbyteOutall.insert( rgbyteOutall.end(), rgbyteOut.begin(), rgbyteOut.end() );
}
gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
pixeldata.SetVR( gdcm::VR::OW );
pixeldata.SetByteValue( (char*)&rgbyteOutall[0], (uint32_t)rgbyteOutall.size() );
// Add the pixel data element
reader.GetFile().GetDataSet().Replace( pixeldata );
reader.GetFile().GetHeader().SetDataSetTransferSyntax(
gdcm::TransferSyntax::ExplicitVRLittleEndian);
gdcm::Writer writer;
writer.SetFileName( outfilename );
writer.SetFile( reader.GetFile() );
writer.Write();
std::cout << "Success !" << std::endl;
return 0;
}

```

## 12.69 FixOrientation.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmFile.h"
#include "gdcmOrientation.h"
#include "gdcmAttribute.h"
// Very simple orientation changer, fix invalid dataset
int main(int argc, char* argv[] )
{
// assume AXIAL input for now
if( argc < 3 )
{
std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
return 1;
}
const char *filename = argv[1];
const char *outfilename = argv[2];
gdcm::Reader reader;
reader.SetFileName( filename );
if (! reader.Read() )
{
return 1;
}
const double axial[] = { 1,0,0, 0,1,0 };
(void)axial;
const double coronal[] = { 0,0,1, 1,0,0 };
(void)coronal;
const double sagittal[] = { 0,1,0, 0,0,1 };
(void)sagittal;
gdcm::Attribute<0x0020,0x0032> at1; // IPP

```

```

(void)at1;
gdcm::Attribute<0x0020,0x0037> at2; // IOP
(void)at2;
gdcm::File & f = reader.GetFile();
gdcm::DataSet & ds = f.GetDataSet();
at1.SetFromDataSet( ds );
#ifdef 0
at2.SetFromDataSet( ds );
const double * iop = at2.GetValues();
if( !std::equal(iop, iop + 6, axial ) )
{
    gdcm::Orientation::OrientationType type = gdcm::Orientation::GetType ( iop );
    std::cerr << "Wrong orientation: " << gdcm::Orientation::GetLabel( type ) << std::endl;
    return 1;
}
at2.SetValues( sagittal );
ds.Replace( at2.GetAsDataElement() );
#endif
// for sagittal: swap element 0 & 2
const double tmp0 = at1.GetValue(0);
const double tmp2 = at1.GetValue(2);
(void)tmp2;
//at1.SetValue(tmp2, 0);
//at1.SetValue(tmp0, 2);
at1.SetValue( - tmp0 );
ds.Replace( at1.GetAsDataElement() );
gdcm::Writer writer;
writer.SetFile( f );
writer.SetFileName( outfilename );
if ( !writer.Write() )
{
    return 1;
}
return 0;
}

```

## 12.70 GenAllVR.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDummyValueGenerator.h"
#include "gdcmMediaStorage.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
#include "gdcmDict.h"
#include "gdcmDictEntry.h"
#include "gdcmDicts.h"
#include "gdcmTransferSyntax.h"
#include "gdcmUIDGenerator.h"
#include "gdcmFileExplicitFilter.h"
#include <cstdlib>
#include <cstring>
gdcm::Tag FindTagFromVR(gdcm::Dict const &dict, gdcm::VR const &vr)
{
    using gdcm::Dict;
    Dict::ConstIterator beg = dict.Begin();
    Dict::ConstIterator end = dict.End();
    Dict::ConstIterator it;
    for( it = beg; it != end; ++it)
    {

```

```

    const gdcmm::Tag &t = it->first;
    const gdcmm::DictEntry &de = it->second;
    const gdcmm::VR &vr_de = de.GetVR();
    if( vr == vr_de && !de.GetRetired() && t.GetGroup() >= 0x8 )
    {
        return t;
    }
}
return gdcmm::Tag(0xffff,0xffff);
}
struct rnd_gen {
    rnd_gen(char const* r = "abcdefghijklmnopqrstuvwxyz0123456789")
        : range(r), len(std::strlen(r)) { }
    char operator () ()const {
        return range[static_cast<std::size_t>(std::rand() * (1.0 / ((double)RAND_MAX + 1.0 )) * (double)len)];
    }
private:
    char const* range;
    std::size_t len;
};
/*
*/
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " output.dcm" << std::endl;
        return 1;
    }
    const char *outfilename = argv[1];
    static const gdcmm::Global &g = gdcmm::Global::GetInstance();
    static const gdcmm::Dicts &dicts = g.GetDicts();
    static const gdcmm::Dict &pubdict = dicts.GetPublicDict();
    using gdcmm::VR;
    using gdcmm::Tag;
    gdcmm::Writer w;
    gdcmm::File &f = w.GetFile();
    gdcmm::DataSet &ds = f.GetDataSet();
    gdcmm::FileExplicitFilter fef;
    //fef.SetChangePrivateTags( true );
    fef.SetFile( w.GetFile() );
    if( !fef.Change() )
    {
        std::cerr << "Failed to change" << std::endl;
        return 1;
    }
    gdcmm::SmartPointer<gdcmm::SequenceOfItems> sq = new gdcmm::SequenceOfItems();
    sq->SetLengthToUndefined();
    // gdcmm::DummyValueGenerator dvg;
    const std::size_t len = 10;
    char ss[len+1];
    ss[len] = '\0';
    const char owner_str[] = "GDCM CONFORMANCE TESTS";
    gdcmm::DataElement owner( gdcmm::Tag(0x4d4d, 0x10) );
    owner.SetByteValue(owner_str, (uint32_t)strlen(owner_str));
    owner.SetVR( gdcmm::VR::LO );
    // Create an item
    gdcmm::Item it;
    it.SetVLToUndefined();
    gdcmm::DataSet &nds = it.GetNestedDataSet();
    // nds.Insert(owner);
    // nds.Insert(de);
    // Insert sequence into data set
    gdcmm::DataElement des( gdcmm::Tag(0x4d4d, 0x1001) );
    des.SetVR(gdcmm::VR::SQ);
    des.SetValue(*sq);
    des.SetVLToUndefined();
    ds.Insert( owner );
    ds.Insert( des );
    // avoid INVALID = 0
    for(int i = 1; i < 27; ++i)
    {
        VR vr = (VR::VRType)(1LL << i);
        Tag t = FindTagFromVR( pubdict, vr );
        if( vr != VR::UN && vr != VR::SQ )
        {
            assert( t != Tag(0xffff,0xffff) );
            gdcmm::DataElement de( t );
            std::generate_n(ss, len, rnd_gen());
            de.SetVR( vr );
            de.SetByteValue( ss, (uint32_t)std::strlen( ss ) );

```

```

        nds.Insert( de );
    }
}
sq->AddItem(it);
// Make sure to override any UID stuff
gdcM::UIDGenerator uid;
gdcM::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
de.SetVR( VR::UI );
const char *u = uid.Generate();
de.SetByteValue( u, (uint32_t)strlen(u) );
ds.Insert( de );
de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
de.SetVR( VR::UI );
gdcM::MediaStorage ms( gdcM::MediaStorage::RawDataStorage );
de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
ds.Insert( de );
gdcM::FileMetaInformation &fmi = f.GetHeader();
//fmi.SetDataSetTransferSyntax( gdcM::TransferSyntax::ImplicitVRLittleEndian );
fmi.SetDataSetTransferSyntax( gdcM::TransferSyntax::ExplicitVRLittleEndian );
w.SetCheckFileMetaInformation( true );
w.SetFileName( outfilename );
if ( !w.Write() )
{
    return 1;
}
return 0;
}

```

## 12.71 GenFakeIdentifyFile.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "gdcMReader.h"
#include "gdcMGlobal.h"
#include "gdcMDummyValueGenerator.h"
#include "gdcMMediaStorage.h"
#include "gdcMWriter.h"
#include "gdcMItem.h"
#include "gdcMImageReader.h"
#include "gdcMSequenceOfItems.h"
#include "gdcMAttribute.h"
#include "gdcMFile.h"
#include "gdcMTag.h"
#include "gdcMDict.h"
#include "gdcMDictEntry.h"
#include "gdcMDicts.h"
#include "gdcMTransferSyntax.h"
#include "gdcMUIDGenerator.h"
#include "gdcMAnonymizer.h"
#include <cstdlib>
#include <cstring>
gdcM::DataElement CreateFakeElement(gdcM::Tag const &tag, bool toremove)
{
    static const gdcM::Global &g = gdcM::Global::GetInstance();
    static const gdcM::Dicts &dicts = g.GetDicts();
    static const gdcM::Dict &pubdict = dicts.GetPublicDict();
    static size_t countglobal = 0;
    static std::vector<gdcM::Tag> balcptags =
        gdcM::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
    size_t count = countglobal % balcptags.size();
    const gdcM::DictEntry &dictentry = pubdict.GetDictEntry(tag);
    gdcM::DataElement de;
    de.SetTag( tag );
    using gdcM::VR;
    const VR &vr = dictentry.GetVR();
    //if( vr != VR::INVALID )

```

```

if( vr.IsDual() )
{
    if( vr == VR::US_SS )
    {
        de.SetVR( VR::US );
    }
    else if( vr == VR::US_SS_OW )
    {
        de.SetVR( VR::OW );
    }
    else if( vr == VR::OB_OW )
    {
        de.SetVR( VR::OB );
    }
}
else
{
    de.SetVR( vr );
}

const char str[] = "BasicApplicationLevelConfidentialityProfileAttributes";
const char safe[] = "This is safe to keep";
if( de.GetVR() != VR::SQ )
{
    if( toremove )
        de.SetByteValue( str, (uint32_t)strlen(str) );
    else
        de.SetByteValue( safe, (uint32_t)strlen(safe) );
}
else
{
    // Create an item
    gdcm::Item it;
    it.SetVLToUndefined();
    gdcm::DataSet &nds = it.GetNestedDataSet();
    // Insert sequence into data set
    assert(de.GetVR() == gdcm::VR::SQ );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();
    de.SetValue(*sq);
    de.SetVLToUndefined();
    //ds.Insert(de);
    if( !toremove )
    {
        nds.Insert( CreateFakeElement( balcptags[count], true ) );
        countglobal++;
    }
    else
    {
        gdcm::Attribute<0x0008,0x0000> at1 = { 0 }; // This element has no reason to be 'anonymized'...
        nds.Insert( at1.GetAsDataElement() );
        gdcm::Attribute<0x000a,0x0000> at2 = { 0 };
        nds.Insert( at2.GetAsDataElement() );
    }
    sq->AddItem(it);
}
return de;
}
/*
*/
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " output.dcm" << std::endl;
        return 1;
    }
    using gdcm::Tag;
    using gdcm::VR;
    const char *outfilename = argv[1];
    std::vector<gdcm::Tag> balcptags =
        gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
    gdcm::Writer w;
    gdcm::File &f = w.GetFile();
    gdcm::DataSet &ds = f.GetDataSet();
    // Add attribute that need to be anonymized:
    std::vector<gdcm::Tag>::const_iterator it = balcptags.begin();
    for( ; it != balcptags.end(); ++it )
    {
        ds.Insert( CreateFakeElement( *it, true ) );
    }
    // Add attribute that do NOT need to be anonymized:

```

```

static const gdcm::Global &g = gdcm::Global::GetInstance();
static const gdcm::Dicts &dicts = g.GetDicts();
static const gdcm::Dict &pubdict = dicts.GetPublicDict();
using gdcm::Dict;
Dict::ConstIterator dictit = pubdict.Begin();
for(; dictit != pubdict.End(); ++dictit)
{
    const gdcm::Tag &dicttag = dictit->first;
    if( dicttag == Tag(0x6e65,0x6146) ) break;
    //const gdcm::DictEntry &dictentry = dictit->second;
    ds.Insert( CreateFakeElement( dicttag, false ) );
}
ds.Remove( gdcm::Tag(0x400,0x500) );
ds.Remove( gdcm::Tag(0x12,0x62) );
ds.Remove( gdcm::Tag(0x12,0x63) );
// Make sure to override any UID stuff
gdcm::UIDGenerator uid;
gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
de.SetVR( VR::UI );
const char *u = uid.Generate();
de.SetByteValue( u, (uint32_t)strlen(u) );
//ds.Insert( de );
ds.Replace( de );
de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
de.SetVR( VR::UI );
gdcm::MediaStorage ms( gdcm::MediaStorage::RawDataStorage );
de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
ds.Replace( de ); // replace !
gdcm::FileMetaInformation &fmi = f.GetHeader();
//fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
fmi.SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
w.SetCheckFileMetaInformation( true );
w.SetFileName( outfilename );
if (!w.Write() )
{
    return 1;
}
return 0;
}

```

## 12.72 GenLongSeqs.cxx

```

/*=====

```

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```

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"
#include "gdcmTag.h"
/*
 * This example is used to generate the file:
 *
 *
 * There is a flaw in the DICOM design were it is assumed that Sequence can be
 * either represented as undefined length or defined length. This should work
 * in most case, but the undefined length is a little more general and can
 * store sequence of items that a defined length cannot.
 * We need to make sure that we can store numerous Item in a SQ
 *
 * Warning: do not try to compute the group length elements !
 * Warning: You may need a 64bits machine for this example to work.
 */
int main(int argc, char *argv[])
{

```

```

if( argc < 3 )
{
    std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
    return 1;
}
const char *filename = argv[1];
const char *outfilename = argv[2];
gdcm::Reader reader;
reader.SetFileName( filename );
if( !reader.Read() )
{
    return 1;
}
gdcm::File &file = reader.GetFile();
gdcm::DataSet &ds = file.GetDataSet();
// Create a Sequence
gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
sq->SetLengthToUndefined();
const char owner_str[] = "GDCM CONFORMANCE TESTS";
gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
owner.SetByteValue( owner_str, (uint32_t)strlen(owner_str));
owner.SetVR( gdcm::VR::LO );
size_t nitems = 1000;
nitems += std::numeric_limits<uint32_t>::max();
for(unsigned int idx = 0; idx < nitems; ++idx)
{
    // Create a dataelement
    //gdcm::DataElement de( gdcm::Tag(0x4d4d, 0x1002) );
    //de.SetByteValue(ptr, ptr_len);
    //de.SetVR( gdcm::VR::OB );
    // Create an item
    gdcm::Item it;
    it.SetVLToUndefined();
    //gdcm::DataSet &nds = it.GetNestedDataSet();
    //nds.Insert(owner);
    //nds.Insert(de);
    sq->AddItem(it);
}
// Insert sequence into data set
gdcm::DataElement des( gdcm::Tag(0x4d4d, 0x1001) );
des.SetVR(gdcm::VR::SQ);
des.SetValue(*sq);
des.SetVLToUndefined();
ds.Insert(owner);
ds.Insert(des);
gdcm::Writer w;
w.SetFile( file );
//w.SetCheckFileMetaInformation( true );
w.SetFileName( outfile );
if( !w.Write() )
{
    return 1;
}
return 0;
}

```

## 12.73 GenSeqs.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmItem.h"
#include "gdcmImageReader.h"
#include "gdcmSequenceOfItems.h"
#include "gdcmFile.h"

```

```

#include "gdcmTag.h"
/*
 * This example is used to generate the file:
 *
 * gdcmConformanceTests/SequenceWithUndefinedLengthNotConvertibleToDefinedLength.dcm
 *
 * There is a flaw in the DICOM design where it is assumed that Sequence can be
 * either represented as undefined length or defined length. This should work
 * in most case, but the undefined length is a little more general and can
 * store sequence of items that a defined length cannot.
 * Deflated syntax was used in this case since this synthetic example can be
 * nicely compressed using this transfer syntax.
 *
 * Warning: do not try to compute the group length elements !
 * Warning: You may need a 64bits machine for this example to work.
 */
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    //const unsigned int nitems = 1000;
    const unsigned int ptr_len = 42; /*94967296 / nitems; */
    //assert( ptr_len == 42949672 );
    char *ptr = new char[ptr_len];
    memset(ptr,0,ptr_len);
    // Create a Sequence
    gdcm::SmartPointer<gdcm::SequenceOfItems> sq = new gdcm::SequenceOfItems();
    sq->SetLengthToUndefined();
    const char owner_str[] = "GDCM CONFORMANCE TESTS";
    gdcm::DataElement owner( gdcm::Tag(0x4d4d, 0x10) );
    owner.SetByteValue( owner_str, (uint32_t)strlen(owner_str));
    owner.SetVR( gdcm::VR::LO );
    for(unsigned int idx = 0; idx < 10/* nitems*/; ++idx)
    {
        // Create a dataelement
        gdcm::DataElement de( gdcm::Tag(0x4d4d, 0x1002) );
        de.SetByteValue(ptr, ptr_len);
        de.SetVR( gdcm::VR::OB );
        // Create an item
        gdcm::Item it;
        it.SetVLToUndefined();
        gdcm::DataSet &nds = it.GetNestedDataSet();
        nds.Insert( owner );
        nds.Insert( de );
        sq->AddItem(it);
    }
    // Insert sequence into data set
    gdcm::DataElement des( gdcm::Tag(0x4d4d,0x1001) );
    des.SetVR(gdcm::VR::SQ);
    des.SetValue(*sq);
    des.SetVLToUndefined();
    ds.Insert( owner );
    ds.Insert( des );
    gdcm::Writer w;
    w.SetFile( file );
    //w.SetCheckFileMetaInformation( true );
    w.SetFileName( outfile );
    if ( !w.Write() )
    {
        return 1;
    }
    return 0;
}

```



## 12.74 GenerateStandardSOPClasses.cxx

```

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=====*/
/*
*/
#include "gdcmDefs.h"
#include "gdcmUIDs.h"
#include "gdcmGlobal.h"
#include "gdcmMediaStorage.h"
#include "gdcmSOPClassUIDToIOD.h"
int main(int , char *[])
{
    using gdcm::MediaStorage;
    gdcm::Global& g = gdcm::Global::GetInstance();
    if( !g.LoadResourcesFiles() )
    {
        std::cerr << "Could not LoadResourcesFiles" << std::endl;
        return 1;
    }
    const gdcm::Defs &defs = g.GetDefs();
    int ret = 0;
    //std::cout << "Table B.5-1 STANDARD SOP CLASSES" << std::endl;
    std::cout << "SOP Class Name,SOP Class UID,IOD Specification (defined in PS 3.3)" << std::endl;
    gdcm::MediaStorage::MSType mst;
    for ( mst = gdcm::MediaStorage::MediaStorageDirectoryStorage; mst < gdcm::MediaStorage::MS_END;
        mst = (gdcm::MediaStorage::MSType)(mst + 1) )
    {
        const char *iod = defs.GetIODNameFromMediaStorage(mst);
        gdcm::UIDs uid;
        uid.SetFromUID( gdcm::MediaStorage::GetMSString(mst) /*mst.GetString()*/ );
        if( iod )
        {
            const char *iod_ref = gdcm::SOPClassUIDToIOD::GetIOD(uid);
            if( iod_ref )
            {
                std::string iod_ref_str = iod_ref;
                //iod_ref_str += " IOD Modules";
                //if( iod_ref_str != iod )
                {
                    //std::cout << "UID: " << uid << " ";
                    std::cout << "'" << uid.GetName() << "' << " << "'" << uid.GetString() << "' << " << "'" << iod << "' << " << std::endl;
                    //std::cout << "Incompatible IODs:  [" << iod << "] versus ref= [" << iod_ref_str << "]" << std::endl;
                    ++ret;
                }
            }
        }
    }
    return 0;
}

```

## 12.75 GetJPEGSamplePrecision.cxx

```

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```

```

=====*/
/*
 * This example is a little helper to detect the famous SIEMENS JPEG lossless compressed image
 * where DICOM is declared as:
 *
 * (0028,0100) US 16 # 2,1 Bits Allocated
 * (0028,0101) US 12 # 2,1 Bits Stored
 * (0028,0102) US 11 # 2,1 High Bit
 * (0028,0103) US 0 # 2,1 Pixel Representation
 *
 * But where JPEG is:
 *
 * JPEG_SOF_Parameters:
 * SamplePrecision = 16
 * nLines = 192
 * nSamplesPerLine = 192
 * nComponentsInFrame = 1
 * component 0
 * ComponentIdentifier = 1
 * HorizontalSamplingFactor = 1
 * VerticalSamplingFactor = 1
 * QuantizationTableDestinationSelector = 0
 *
 * This case is valid. One simply has to use the 16bits jpeg decoder to decode the 12bits stored image.
 * This used to be an issue in GDCM 1.2.x (fixed in GDCM 1.2.5)
 *
 * The main return 0 (no error) when the file read is actually a potential problem. At the end of the main
 * function, the jpeg stream is stored in the filename specified as second argument
 */
#include "gdcmImageReader.h"
#include "gdcmSequenceOfFragments.h"
#include "gdcmJPEGCodec.h"
#include <iostream>
#include <fstream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.jpg" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }
    // The output of gdcm::Reader is a gdcm::File
    const gdcm::File &file = reader.GetFile();
    const gdcm::Image &image = reader.GetImage();
    const gdcm::TransferSyntax &ts = file.GetHeader().GetDataSetTransferSyntax();
    if( ts != gdcm::TransferSyntax::JPEGLosslessProcess14 && ts != gdcm::TransferSyntax::JPEGLosslessProcess14_1 )
    {
        std::cerr << "Input is not a lossless JPEG" << std::endl;
        return 1;
    }
    // the dataset is the the set of element we are interested in:
    const gdcm::DataSet &ds = file.GetDataSet();
    const gdcm::Tag rawTag(0x7fe0, 0x0010); // Default to Pixel Data
    const gdcm::DataElement &pdde = ds.GetDataElement( rawTag );
    const gdcm::SequenceOfFragments *sf = pdde.GetSequenceOfFragments();
    if( sf )
    {
        std::ofstream output(outfilename, std::ios::binary);
        sf->WriteBuffer(output);
    }
    else
    {
        std::cerr << "Error" << std::endl;
        return 1;
    }
    gdcm::JPEGCodec jpeg;
    std::ifstream is(outfilename, std::ios::binary);
    gdcm::PixelFormat pf ( gdcm::PixelFormat::UINT8 ); // let's pretend it's a 8bits jpeg
    jpeg.SetPixelFormat( pf );
    gdcm::TransferSyntax ts_jpeg;
    bool b = jpeg.GetHeaderInfo( is, ts_jpeg );

```

```

if( !b )
{
    return 1;
}
//jpeg.Print( std::cout );
if( jpeg.GetPixelFormat().GetBitsAllocated() != image.GetPixelFormat().GetBitsAllocated()
|| jpeg.GetPixelFormat().GetBitsStored() != image.GetPixelFormat().GetBitsStored() )
{
    std::cerr << "There is a mismatch in between DICOM declared Pixel Format and Sample Precision used in the
    JPEG stream" << std::endl;
    return 0;
}
std::cout << jpeg.GetPixelFormat() << std::endl;
std::cout << image.GetPixelFormat() << std::endl;
return 1;
}

```

## 12.76 GetSequenceUltrasound.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmAttribute.h"
bool Region ( char* nomefile, unsigned int* X_min, unsigned int* Y_min, unsigned int* X_max, unsigned int* Y_max
);
int main(int argc, char* argv[] )
{
    // Controllo del numero di argomenti introdotti da riga di comando
    if( argc < 2 )
    {
        std::cerr << "Usage:  " << std::endl;
        std::cerr << argv[0] << " inputImageFile  " << std::endl;
        return EXIT_FAILURE;
    }
    unsigned int x_min = 1;
    unsigned int y_min = 1;
    unsigned int x_max = 1;
    unsigned int y_max = 1;
    if( Region ( argv[1], &x_min, &y_min, &x_max, &y_max ) )
    {
        std::cout << "x_min = " << x_min << std::endl;
        std::cout << "y_min = " << y_min << std::endl;
        std::cout << "x_max = " << x_max << std::endl;
        std::cout << "y_max = " << y_max << std::endl;
    }
    else
    {
        std::cout << "no\n";
    }
}
bool Region ( char* nomefile, unsigned int* X_min, unsigned int* Y_min, unsigned int* X_max, unsigned int* Y_max
)
{
    gdcm::Reader reader;
    reader.SetFileName( nomefile );
    if( !reader.Read() )
    {
        std::cerr << "Could not read:  " << nomefile << std::endl;
        return false;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    gdcm::Tag tsqr(0x0018,0x6011);
    if( !ds.FindDataElement( tsqr ) )
    {
        return false;
    }
}

```

```

    }
    const gdcm::DataElement &sqr= ds.GetDataElement( tsqr );
    //std::cout << sqr << std::endl;
    const gdcm::SequenceOfItems *sqi = sqr.GetValueAssSQ();
    if( !sqi || !sqi->GetNumberOfItems() )
    {
        return false;
    }
    //std::cout << sqi << std::endl;
    const gdcm::Item & item = sqi->GetItem(1);
    //std::cout << item << std::endl;
    const gdcm::DataSet& nestedds = item.GetNestedDataSet();
    //std::cout << nestedds << std::endl;
    gdcm::Tag tX0(0x0018,0x6018);
    gdcm::Tag tY0(0x0018,0x601a);
    gdcm::Tag tX1(0x0018,0x601c);
    gdcm::Tag tY1(0x0018,0x601e);
    if( (!nestedds.FindDataElement( tX0 ))||(!nestedds.FindDataElement( tY0 ))||(!nestedds.FindDataElement( tX1
        ))||(!nestedds.FindDataElement( tY1 )) )
    {
        return false;
    }
    const gdcm::DataElement& deX0 = nestedds.GetDataElement( tX0 );
    const gdcm::DataElement& deY0 = nestedds.GetDataElement( tY0 );
    const gdcm::DataElement& deX1 = nestedds.GetDataElement( tX1 );
    const gdcm::DataElement& deY1 = nestedds.GetDataElement( tY1 );
    //std::cout << deX0 << std::endl << deY0 << std::endl << deX1 << std::endl << deY1 << std::endl;
    //const gdcm::ByteValue *bvX0 = deX0.GetByteValue();
    //const gdcm::ByteValue *bvY0 = deY0.GetByteValue();
    //const gdcm::ByteValue *bvX1 = deX1.GetByteValue();
    //const gdcm::ByteValue *bvY1 = deY1.GetByteValue();
    //std::cout << bvX0 << std::endl << bvY0 << std::endl << bvX1 << std::endl << bvY1 << std::endl;
    gdcm::Attribute<0x0018,0x6018> atX0;
    gdcm::Attribute<0x0018,0x601a> atY0;
    gdcm::Attribute<0x0018,0x601c> atX1;
    gdcm::Attribute<0x0018,0x601e> atY1;
    atX0.SetFromDataElement( deX0 );
    atY0.SetFromDataElement( deY0 );
    atX1.SetFromDataElement( deX1 );
    atY1.SetFromDataElement( deY1 );
    uint32_t X0 = atX0.GetValue();
    uint32_t Y0 = atY0.GetValue();
    uint32_t X1 = atX1.GetValue();
    uint32_t Y1 = atY1.GetValue();
    std::cout << X0 << std::endl << Y0 << std::endl << X1 << std::endl << Y1 << std::endl;
    *X_min = static_cast<unsigned int>(X0);
    *Y_min = static_cast<unsigned int>(Y0);
    *X_max = static_cast<unsigned int>(X1);
    *Y_max = static_cast<unsigned int>(Y1);
    //std::cout << "X_min = " << *X_min << std::endl;
    //std::cout << "Y_min = " << *Y_min << std::endl;
    //std::cout << "X_max = " << *X_max << std::endl;
    //std::cout << "Y_max = " << *Y_max << std::endl;
    return true;
}

```

## 12.77 GetSubSequenceData.cxx

```

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=====*/
#include "gdcmReader.h"
#include "gdcmImage.h"
#include "gdcmImageWriter.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include "gdcmUIDGenerator.h"

```

```

#include <iostream>
#include <string>
#include <map>
/*
 * This example will extract the Movie from the private group of
 * GEMS_Ultrasound_MovieGroup_001 See Attribute
 * (7fel,60,GEMS_Ultrasound_MovieGroup_001)
 *
 * The output file will be stored in 'outvid.dcm' as
 * MultiframeGrayscaleByteSecondaryCaptureImageStorage
 */
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    using namespace gdcm;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    reader.Read();
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    const PrivateTag tseq(0x7fel,0x1,"GEMS_Ultrasound_MovieGroup_001");
    if( !ds.FindDataElement( tseq ) ) return 1;
    const DataElement& seq = ds.GetDataElement( tseq );
    SmartPointer<SequenceOfItems> sqi = seq.GetValueAsSQ();
    assert( sqi->GetNumberOfItems() == 1 );
    Item &item = sqi->GetItem(1);
    DataSet &subds = item.GetNestedDataSet();
    const PrivateTag tseq1(0x7fel,0x10,"GEMS_Ultrasound_MovieGroup_001");
    if( !subds.FindDataElement( tseq1 ) ) return 1;
    const DataElement& seq1 = subds.GetDataElement( tseq1 );
    SmartPointer<SequenceOfItems> sqi2 = seq1.GetValueAsSQ();
    //int n = sqi2->GetNumberOfItems();
    int index = 1;
    Item &item2 = sqi2->GetItem(index);
    DataSet &subds2 = item2.GetNestedDataSet();
    const PrivateTag tseq2(0x7fel,0x20,"GEMS_Ultrasound_MovieGroup_001");
    if( !subds2.FindDataElement( tseq2 ) ) return 1;
    const DataElement& seq2 = subds2.GetDataElement( tseq2 );
    // std::cout << seq2 << std::endl;
    SmartPointer<SequenceOfItems> sqi3 = seq2.GetValueAsSQ();
    size_t ni3 = sqi3->GetNumberOfItems(); (void)ni3;
    assert( sqi3->GetNumberOfItems() >= 1 );
    Item &item3 = sqi3->GetItem(1);
    DataSet &subds3 = item3.GetNestedDataSet();
    const PrivateTag tseq6(0x7fel,0x26,"GEMS_Ultrasound_MovieGroup_001");
    if( !subds3.FindDataElement( tseq6 ) ) return 1;
    const DataElement& seq6 = subds3.GetDataElement( tseq6 );
    SmartPointer<SequenceOfItems> sqi6 = seq6.GetValueAsSQ();
    size_t ni6 = sqi6->GetNumberOfItems();
    assert( sqi6->GetNumberOfItems() >= 1 );
    const PrivateTag tseq7(0x7fel,0x86,"GEMS_Ultrasound_MovieGroup_001");
    int dimx = 0, dimy = 0;
    for( size_t i6 = 1; i6 <= ni6; ++i6 )
    {
        Item &item6 = sqi6->GetItem(i6);
        DataSet &subds6 = item6.GetNestedDataSet();
        if( subds6.FindDataElement( tseq7 ) )
        {
            Element<VR::SL, VM::VM4> el;
            el.SetFromDataElement( subds6.GetDataElement( tseq7 ) );
            std::cout << "El= " << el.GetValue() << std::endl;
            dimx = el.GetValue(0);
            dimy = el.GetValue(1);
        }
    }
    const PrivateTag tseq3(0x7fel,0x36,"GEMS_Ultrasound_MovieGroup_001");
    if( !subds3.FindDataElement( tseq3 ) ) return 1;
    const DataElement& seq3 = subds3.GetDataElement( tseq3 );
    // std::cout << seq3 << std::endl;
    SmartPointer<SequenceOfItems> sqi4 = seq3.GetValueAsSQ();
    size_t ni4 = sqi4->GetNumberOfItems();
    assert( sqi4->GetNumberOfItems() >= 1 );
    const PrivateTag tseq8(0x7fel,0x37,"GEMS_Ultrasound_MovieGroup_001");
    const PrivateTag tseq4(0x7fel,0x43,"GEMS_Ultrasound_MovieGroup_001");
    const PrivateTag tseq5(0x7fel,0x60,"GEMS_Ultrasound_MovieGroup_001");
    std::vector<char> imbuffer;
    int dimz = 0;
    for( size_t i4 = 1; i4 <= ni4; ++i4 )
    {
        Item &item4 = sqi4->GetItem(i4);

```

```

    DataSet &subds4 = item4.GetNestedDataSet();
    if( !subds4.FindDataElement( tseq8 ) ) return 1;
    const DataElement& de8 = subds4.GetDataElement( tseq8 );
    Element<VR::UL,VM::VM1> ldimz;
    ldimz.SetFromDataElement( de8 );
    dimz += ldimz.GetValue();
    if( !subds4.FindDataElement( tseq4 ) ) return 1;
    const DataElement& seq4 = subds4.GetDataElement( tseq4 );
    if( !subds4.FindDataElement( tseq5 ) ) return 1;
    const DataElement& seq5 = subds4.GetDataElement( tseq5 );
    // std::cout << seq4 << std::endl;
    // std::cout << seq5 << std::endl;
    const ByteValue *bv4 = seq4.GetByteValue();
    (void)bv4;
#ifdef 0
    {
        std::ofstream out( "/tmp/mo4", std::ios::binary );
        out.write( bv4->GetPointer(), bv4->GetLength());
        out.close();
    }
#endif
    const ByteValue *bv5 = seq5.GetByteValue();
#ifdef 0
    {
        std::ofstream out( "/tmp/mo5", std::ios::binary );
        out.write( bv5->GetPointer(), bv5->GetLength());
        out.close();
    }
#endif
    std::cout << bv5->GetLength() << std::endl;
    imbuffer.insert( imbuffer.begin(), bv5->GetPointer(), bv5->GetPointer() + bv5->GetLength() );
}
DataElement fakedata;
fakedata.SetByteValue( &imbuffer[0], (uint32_t)imbuffer.size() );
gdcm::SmartPointer<gdcm::Image> im = new gdcm::Image;
im->SetNumberOfDimensions( 3 );
im->SetDimension(0, dimx );
im->SetDimension(1, dimy );
im->SetDimension(2, dimz );
size_t l1 = imbuffer.size();
(void)l1;
size_t l2 = im->GetBufferLength();
(void)l2;
assert( im->GetBufferLength() == imbuffer.size() );
im->SetPhotometricInterpretation( gdcm::PhotometricInterpretation::MONOCHROME2 );
im->SetDataElement( fakedata );
gdcm::ImageWriter w;
w.SetImage( *im );
DataSet &dataset = w.GetFile().GetDataSet();
gdcm::UIDGenerator uid;
gdcm::DataElement de( Tag(0x8,0x18) ); // SOP Instance UID
de.SetVR( VR::UI );
const char *u = uid.Generate();
de.SetByteValue( u, (uint32_t)strlen(u) );
//ds.Insert( de );
dataset.Replace( de );
de.SetTag( Tag(0x8,0x16) ); // SOP Class UID
de.SetVR( VR::UI );
gdcm::MediaStorage ms(
    gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage );
de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
dataset.Replace( de ); // replace !
w.SetFileName( "outvid.dcm" );
if( !w.Write() )
{
    return 1;
}
return 0;
}

```

## 12.78 HelloVizWorld.cxx

```

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```

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```

=====*/
/*
 * Basic example for dealing with a DICOM file that contains an Image
 * (read: Pixel Data element)
 */
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmImage.h"
#include "gdcmPhotometricInterpretation.h"
#include <iostream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    // Instantiate the image reader:
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }
    // If we reach here, we know for sure 2 things:
    // 1. It is a valid DICOM
    // 2. And it contains an Image !
    // The output of superclass gdcm::Reader is a gdcm::File
    //gdcm::File &file = reader.GetFile();
    // The other output of gdcm::ImageReader is a gdcm::Image
    const gdcm::Image &image = reader.GetImage();
    // Let's get some property from the image:
    unsigned int ndim = image.GetNumberOfDimensions();
    // Dimensions of the image:
    const unsigned int *dims = image.GetDimensions();
    // Origin
    const double *origin = image.GetOrigin();
    const gdcm::PhotometricInterpretation &pi = image.GetPhotometricInterpretation();
    for(unsigned int i = 0; i < ndim; ++i)
    {
        std::cout << "Dim(" << i << "): " << dims[i] << std::endl;
    }
    for(unsigned int i = 0; i < ndim; ++i)
    {
        std::cout << "Origin(" << i << "): " << origin[i] << std::endl;
    }
    std::cout << "PhotometricInterpretation: " << pi << std::endl;
    // Write the modified DataSet back to disk
    gdcm::ImageWriter writer;
    writer.SetImage( image );
    writer.SetFileName( outfile );
    //writer.SetFile( file ); // We purposely NOT copy the meta information from the input
    // file, and instead only pass the image
    if( !writer.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }
    return 0;
}

```

## 12.79 HelloWorld.cxx

```

/*=====

```

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```

=====*/
/*
 * This example is ... guess what this is for :)
 */
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include <iostream>
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    // Instantiate the reader:
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
        return 1;
    }
    // If we reach here, we know for sure only 1 thing:
    // It is a valid DICOM file (potentially an old ACR-NEMA 1.0/2.0 file)
    // (Maybe, it's NOT a Dicom image -could be a DICOMDIR, a RTSTRUCT, etc-)
    // The output of gdcm::Reader is a gdcm::File
    gdcm::File &file = reader.GetFile();
    // the dataset is the the set of element we are interested in:
    gdcm::DataSet &ds = file.GetDataSet();
    // Construct a static(*) type for Image Comments :
    gdcm::Attribute<0x0020,0x4000> imagecomments;
    imagecomments.SetValue( "Hello, World !" );
    // Now replace the Image Comments from the dataset with our:
    ds.Replace( imagecomments.GetAsDataElement() );
    // Write the modified DataSet back to disk
    gdcm::Writer writer;
    writer.CheckFileMetaInformationOff(); // Do not attempt to reconstruct the file meta to preserve the file
                                         // as close to the original as possible.
    writer.SetFileName( outfile );
    writer.SetFile( file );
    if( !writer.Write() )
    {
        std::cerr << "Could not write: " << outfile << std::endl;
        return 1;
    }
    return 0;
}
/*
 * (*) static type, means that extra DICOM information VR & VM are computed at compilation time.
 * The compiler is deducing those values from the template arguments of the class.
 */

```

## 12.80 LargeVRDSExplicit.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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```

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 PURPOSE. See the above copyright notice for more information.



```

=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
#include "gdcmFileExplicitFilter.h"
#include "gdcmSequenceOfItems.h"
bool interpolate(const double * pts, size_t npts, std::vector<double> &out )
{
    out.clear();
    for(size_t i = 0; i < 2*npts; ++i )
    {
        const size_t j = i / 2;
        if( i % 2 )
        {
            if( j != npts - 1 )
            {
                assert( 3*j+5 < 3*npts );
                const double midpointx = (pts[3*j+0] + pts[3*j+3]) / 2;
                const double midpointy = (pts[3*j+1] + pts[3*j+4]) / 2;
                const double midpointz = (pts[3*j+2] + pts[3*j+5]) / 2;
                out.push_back( midpointx );
                out.push_back( midpointy );
                out.push_back( midpointz );
            }
        }
        else
        {
            assert( j < npts );
            out.push_back( pts[3*j+0] );
            out.push_back( pts[3*j+1] );
            out.push_back( pts[3*j+2] );
        }
    }
    assert( out.size() == 2 * npts * 3 - 3 );
    return true;
}

int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    gdcm::FileExplicitFilter fef;
    //fef.SetChangePrivateTags( changeprivatetags );
    fef.SetFile( reader.GetFile() );
    if( !fef.Change() )
    {
        std::cerr << "Failed to change: " << filename << std::endl;
        return 1;
    }
    // (3006,0039) SQ (Sequence with undefined length #=4)      # u/l, 1 ROIContourSequence
    gdcm::Tag tag(0x3006,0x0039);
    const gdcm::DataElement &roicsq = ds.GetDataElement( tag );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = roicsq.GetValueAsSQ();
    //sqi->SetNumberOfItems( 1 );
    const gdcm::Item &item = sqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds = item.GetNestedDataSet();
    gdcm::Tag tcsq(0x3006,0x0040);
    if( !nestedds.FindDataElement( tcsq ) )
    {
        return 0;
    }
    const gdcm::DataElement& csq = nestedds.GetDataElement( tcsq );
    gdcm::SmartPointer<gdcm::SequenceOfItems> sqi2 = csq.GetValueAsSQ();
    if( !sqi2 || !sqi2->GetNumberOfItems() )
    {
        return 0;
    }
    //unsigned int nitens = sqi2->GetNumberOfItems();
    gdcm::Item & item2 = sqi2->GetItem(1); // Item start at #1

```

```

gdcmm::DataSet& nestedds2 = item2.GetNestedDataSet();
//item2.SetVLToUndefined();
//std::cout << nestedds2 << std::endl;
// (3006,0050) DS [43.57636\65.52504\ -10.0\46.043102\62.564945\ -10.0\49.126537\60.714... # 398,48 ContourData
gdcmm::Tag tcontourdata(0x3006,0x0050);
const gdcmm::DataElement & contourdata = nestedds2.GetDataElement( tcontourdata );
//std::cout << contourdata << std::endl;
//const gdcmm::ByteValue *bv = contourdata.GetByteValue();
gdcmm::Attribute<0x3006,0x0046> ncontourpoints;
ncontourpoints.Set( nestedds2 );
gdcmm::Attribute<0x3006,0x0050> at;
at.SetFromDataElement( contourdata );
const double* pts = at.GetValues();
unsigned int npts = at.GetNumberOfValues() / 3;
std::vector<double> out( pts, pts + npts * 3 );
std::vector<double> out2;
//const unsigned int niter = 7;
const unsigned int niter = 8;
for( unsigned int i = 0; i < niter; ++i)
{
    //bool b =
    interpolate(&out[0], out.size() / 3, out2);
    //const double *pout = &out[0];
    out = out2;
    out2.clear();
}
assert( out.size() % 3 == 0 );
gdcmm::Attribute<0x3006,0x0050> at_interpolate;
at_interpolate.SetNumberOfValues( (unsigned int)(out.size() / 3) );
at_interpolate.SetValues( &out[0], (uint32_t)out.size() );
ncontourpoints.SetValue( at_interpolate.GetNumberOfValues() / 3 );
nestedds2.Replace( at_interpolate.GetAsDataElement() );
nestedds2.Replace( ncontourpoints.GetAsDataElement() );
//assert(0);
// Let's take item one and subdivide it
gdcmm::TransferSyntax ts = gdcmm::TransferSyntax::ImplicitVRLittleEndian;
ts = gdcmm::TransferSyntax::ExplicitVRLittleEndian;
gdcmm::FileMetaInformation &fmi = file.GetHeader();
const char *tsuid = gdcmm::TransferSyntax::GetTSString( ts );
// const char * is ok since padding is \0 anyway...
gdcmm::DataElement de( gdcmm::Tag(0x0002,0x0010) );
de.SetByteValue( tsuid, (uint32_t)strlen(tsuid) );
de.SetVR( gdcmm::Attribute<0x0002, 0x0010>::GetVR() );
fmi.Replace( de );
fmi.Remove( gdcmm::Tag(0x0002,0x0012) ); // will be regenerated
fmi.Remove( gdcmm::Tag(0x0002,0x0013) ); // ' ' ' '
fmi.SetDataSetTransferSyntax(ts);
gdcmm::Writer w;
w.SetFile( file );
w.SetFileName( outfilename );
if ( !w.Write() )
{
    return 1;
}
return 0;
}

```

## 12.81 MakeTemplate.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmmFileAnonymizer.h"
#include "gdcmmReader.h"
#include "gdcmmWriter.h"
int main(int argc, char *argv[])
{

```

```

if( argc < 3 ) return 1;
const char* filename = argv[1];
const char* outfilename = argv[2];
//gdcm::Trace::DebugOn();
// Remove Pixel Data element:
gdcm::FileAnonymizer fa;
fa.SetInputFileName( filename );
fa.SetOutputFileName( outfilename );
fa.Empty( gdcm::Tag(0x7fe0,0x10) );
// cannot replace in-place DICOM header:
//fa.Replace( gdcm::Tag(0x2,0x2), "1.2.840.10008.5.1.4.1.1.7" );
if( !fa.Write() )
{
    std::cerr << "impossible to remove Pixel Data attribute" << std::endl;
    return 1;
}
// Update the DICOM Header:
gdcm::Reader reader;
reader.SetFileName( outfilename );
if( !reader.Read() )
{
    std::cerr << "could not read back" << std::endl;
    return 1;
}
gdcm::File & file = reader.GetFile();
gdcm::FileMetaInformation &fmi = file.GetHeader();
gdcm::TransferSyntax ts = gdcm::TransferSyntax::ImplicitVRLittleEndian;
ts = gdcm::TransferSyntax::ExplicitVRLittleEndian;
fmi.SetDataSetTransferSyntax(ts);
gdcm::Writer writer;
writer.SetFile( file );
writer.SetFileName( outfilename ); // warning overwrite file !
if( !writer.Write() )
{
    std::cerr << "could not write back" << std::endl;
    return 1;
}
return 0;
}

```

## 12.82 MergeTwoFiles.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
* This example will show how one can read in two DICOM files, use the dataset
* from file1 and use image from file2 to save it in a 3rd file.
*
* Eg:
* MergeTwoFiles gdcmData/012345.002.050.dcm gdcmData/test.acr merge.dcm
*/
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmWriter.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char *file1 = argv[1];
    const char *file2 = argv[2];
    const char *file3 = argv[3];

```

```

// Read file1
gdcm::ImageReader reader1;
reader1.SetFileName( file1 );
if( !reader1.Read() )
{
    return 1;
}
// Read file2
gdcm::ImageReader reader2;
reader2.SetFileName( file2 );
if( !reader2.Read() )
{
    return 1;
}
// Ok now let's take the DataSet from file1 and the Image from file2
// Warning: if file2 is -for example- a Secondary Capture Storage, then it has no
// Image Orientation (Patient) thus any Image Orientation (Patient) from file1
// will be discarded...
// let's be fancy. In case reader2 contains explicit, but reader1 is implicit
// we would rather see an implicit output
if( reader1.GetFile().GetHeader().GetDataSetTransferSyntax() == gdcm::TransferSyntax::ImplicitVRLittleEndian )
{
    reader2.GetImage().SetTransferSyntax( gdcm::TransferSyntax::ImplicitVRLittleEndian );
}
gdcm::ImageWriter writer;
writer.SetFileName( file3 );
writer.SetFile( reader1.GetFile() );
// ImageWriter will always use all of gdcm::Image information and override anything wrong from
// reader1.GetFile(), including the Transfer Syntax
writer.SetImage( reader2.GetImage() );
gdcm::DataSet &ds = reader1.GetFile().GetDataSet();
// Make sure that SOPInstanceUID are different
// Simply removing it is sufficient as gdcm::ImageWriter will generate one by default
// if not found.
ds.Remove( gdcm::Tag(0x0008,0x0018) );
if( !writer.Write() )
{
    return 1;
}
return 0;
}

```

## 12.83 MrProtocol.cxx

```

/*=====

```

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```

=====*/

```

```

/*
 *
 */
/*
28 - 'MrProtocol' VM 1, VR UN, SyngoDT 0, NoOfItems 6, Data '### ASCCONV BEGIN ###
ulVersion                               = 0xbee332
tSequenceFileName                       = "%SiemensSeq%\fl_fq_shphs"
tProtocolName                           = "flash+AF8-100+AF8-through-plane+AF8-V"
tReferenceImage0                        = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004658"
tReferenceImage1                        = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004635"
tReferenceImage2                        = "1.3.12.2.1107.5.2.9.16041.30000007062106100181200004683"
ucScanRegionPosValid                    = 0x1
sProtConsistencyInfo.tBaselineString    = "N4_VB11A_LATEST_20031004"
sProtConsistencyInfo.flNominalB0        = 1.494
sProtConsistencyInfo.flGMax              = 22
sProtConsistencyInfo.flRiseTime          = 10
sGRADSPEC.sEddyCompensationX.aflAmplitude[0] = 0.0141111
sGRADSPEC.sEddyCompensationX.aflAmplitude[1] = 0.057038
sGRADSPEC.sEddyCompensationX.aflAmplitude[2] = -0.00986504
sGRADSPEC.sEddyCompensationX.aflAmplitude[3] = 0.00247627

```

```
sGRADSPEC.sEddyCompensationX.aflAmplitude[4] = 0.0026377
sGRADSPEC.sEddyCompensationX.aflTimeConstant[0] = 1.53826
sGRADSPEC.sEddyCompensationX.aflTimeConstant[1] = 0.746617
sGRADSPEC.sEddyCompensationX.aflTimeConstant[2] = 0.339236
sGRADSPEC.sEddyCompensationX.aflTimeConstant[3] = 0.0309809
sGRADSPEC.sEddyCompensationX.aflTimeConstant[4] = 0.00067694
sGRADSPEC.sEddyCompensationY.aflAmplitude[0] = 0.0156411
sGRADSPEC.sEddyCompensationY.aflAmplitude[1] = 0.0440623
sGRADSPEC.sEddyCompensationY.aflAmplitude[2] = -0.00782663
sGRADSPEC.sEddyCompensationY.aflAmplitude[3] = 0.00186828
sGRADSPEC.sEddyCompensationY.aflAmplitude[4] = 0.00154504
sGRADSPEC.sEddyCompensationY.aflTimeConstant[0] = 1.47145
sGRADSPEC.sEddyCompensationY.aflTimeConstant[1] = 0.750538
sGRADSPEC.sEddyCompensationY.aflTimeConstant[2] = 0.339397
sGRADSPEC.sEddyCompensationY.aflTimeConstant[3] = 0.0312962
sGRADSPEC.sEddyCompensationY.aflTimeConstant[4] = 0.000895133
sGRADSPEC.sEddyCompensationZ.aflAmplitude[0] = 0.00618504
sGRADSPEC.sEddyCompensationZ.aflAmplitude[1] = 0.00313121
sGRADSPEC.sEddyCompensationZ.aflAmplitude[2] = 0.000289346
sGRADSPEC.sEddyCompensationZ.aflAmplitude[3] = -0.00019677
sGRADSPEC.sEddyCompensationZ.aflAmplitude[4] = 7.66445e-005
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[0] = 3.37462
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[1] = 0.999351
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[2] = 0.0174646
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[3] = 0.0110094
sGRADSPEC.sEddyCompensationZ.aflTimeConstant[4] = 0.00199922
sGRADSPEC.bEddyCompensationValid = 1
sGRADSPEC.sB0CompensationX.aflAmplitude[0] = 0.307474
sGRADSPEC.sB0CompensationX.aflAmplitude[1] = 0.029337
sGRADSPEC.sB0CompensationX.aflAmplitude[2] = -0.187118
sGRADSPEC.sB0CompensationX.aflTimeConstant[0] = 0.98583
sGRADSPEC.sB0CompensationX.aflTimeConstant[1] = 0.0308443
sGRADSPEC.sB0CompensationX.aflTimeConstant[2] = 0.000466792
sGRADSPEC.sB0CompensationY.aflAmplitude[0] = 0.365257
sGRADSPEC.sB0CompensationY.aflAmplitude[1] = -0.318647
sGRADSPEC.sB0CompensationY.aflAmplitude[2] = -0.0118978
sGRADSPEC.sB0CompensationY.aflTimeConstant[0] = 0.61535
sGRADSPEC.sB0CompensationY.aflTimeConstant[1] = 0.488831
sGRADSPEC.sB0CompensationY.aflTimeConstant[2] = 0.00199991
sGRADSPEC.sB0CompensationZ.aflAmplitude[0] = -0.44647
sGRADSPEC.sB0CompensationZ.aflAmplitude[1] = -0.0455154
sGRADSPEC.sB0CompensationZ.aflAmplitude[2] = -0.0304901
sGRADSPEC.sB0CompensationZ.aflTimeConstant[0] = 0.959231
sGRADSPEC.sB0CompensationZ.aflTimeConstant[1] = 0.0720189
sGRADSPEC.sB0CompensationZ.aflTimeConstant[2] = 0.00190141
sGRADSPEC.bB0CompensationValid = 1
sGRADSPEC.sCrossTermCompensationXY.aflAmplitude[0] = 0.00105046
sGRADSPEC.sCrossTermCompensationXY.aflTimeConstant[0] = 0.842014
sGRADSPEC.sCrossTermCompensationXZ.aflAmplitude[0] = -0.00150189
sGRADSPEC.sCrossTermCompensationXZ.aflTimeConstant[0] = 0.736169
sGRADSPEC.sCrossTermCompensationYX.aflAmplitude[0] = -5.5278e-005
sGRADSPEC.sCrossTermCompensationYX.aflTimeConstant[0] = 0.228697
sGRADSPEC.sCrossTermCompensationYZ.aflAmplitude[0] = 0.000307999
sGRADSPEC.sCrossTermCompensationYZ.aflTimeConstant[0] = 1.19431
sGRADSPEC.sCrossTermCompensationZX.aflAmplitude[0] = -0.000286868
sGRADSPEC.sCrossTermCompensationZX.aflTimeConstant[0] = 0.665979
sGRADSPEC.sCrossTermCompensationZY.aflAmplitude[0] = 0.000355175
sGRADSPEC.sCrossTermCompensationZY.aflTimeConstant[0] = 0.844189
sGRADSPEC.bCrossTermCompensationValid = 1
sGRADSPEC.lOffsetX = 25
sGRADSPEC.lOffsetY = 84
sGRADSPEC.lOffsetZ = 47
sGRADSPEC.bOffsetValid = 1
sGRADSPEC.lDelayX = 12
sGRADSPEC.lDelayY = 11
sGRADSPEC.lDelayZ = 9
sGRADSPEC.bDelayValid = 1
sGRADSPEC.flSensitivityX = 0.000264087
sGRADSPEC.flSensitivityY = 0.000272009
sGRADSPEC.flSensitivityZ = 0.000272677
sGRADSPEC.bSensitivityValid = 1
sGRADSPEC.alShimCurrent[0] = 183
sGRADSPEC.alShimCurrent[1] = -25
sGRADSPEC.alShimCurrent[2] = -85
sGRADSPEC.alShimCurrent[3] = 378
sGRADSPEC.alShimCurrent[4] = 82
sGRADSPEC.bShimCurrentValid = 1
sGRADSPEC.ucMode = 0x2
sTXSPEC.asNucleusInfo[0].tNucleus = "1H"
sTXSPEC.asNucleusInfo[0].lFrequency = 63684693
sTXSPEC.asNucleusInfo[0].bFrequencyValid = 1
```

```

sTXSPEC.asNucleusInfo[0].flReferenceAmplitude = 359.734
sTXSPEC.asNucleusInfo[0].bReferenceAmplitudeValid = 1
sTXSPEC.asNucleusInfo[0].flAmplitudeCorrection = 1
sTXSPEC.asNucleusInfo[0].bAmplitudeCorrectionValid = 1
sTXSPEC.asNucleusInfo[1].bFrequencyValid = 1
sTXSPEC.asNucleusInfo[1].bReferenceAmplitudeValid = 1
sTXSPEC.asNucleusInfo[1].bAmplitudeCorrectionValid = 1
sTXSPEC.arFPULSE[0].tName = "03GreFCE"
sTXSPEC.arFPULSE[0].bAmplitudeValid = 0x1
sTXSPEC.arFPULSE[0].flAmplitude = 147.095
sTXSPEC.arFPULSE[1].tName = "02GreFCE"
sTXSPEC.arFPULSE[1].bAmplitudeValid = 0x1
sTXSPEC.arFPULSE[1].flAmplitude = 147.095
sTXSPEC.arFPULSE[2].tName = "01GreFCE"
sTXSPEC.arFPULSE[2].bAmplitudeValid = 0x1
sTXSPEC.arFPULSE[2].flAmplitude = 147.095
sTXSPEC.lNoOfTraPulses = 3
sTXSPEC.lBTB1ParallelCapacity = 2
sTXSPEC.lBTB1SerialCapacity = 24
sTXSPEC.lBTB2ParallelCapacity = 2
sTXSPEC.lBTB2SerialCapacity = 26
sTXSPEC.bBTBValid = 1
sTXSPEC.flKDynMagnitudeMin = 0.5
sTXSPEC.flKDynMagnitudeMax = 1.5
sTXSPEC.flKDynMagnitudeClipLow = 0.96
sTXSPEC.flKDynMagnitudeClipHigh = 1.04
sTXSPEC.flKDynPhaseMax = 0.698132
sTXSPEC.flKDynPhaseClip = 0.174533
sTXSPEC.bKDynValid = 1
sTXSPEC.ucRFPulseType = 0x1
sTXSPEC.ucExcitMode = 0x1
sTXSPEC.ucSimultaneousExcitation = 0x1
sRXSPEC.lGain = 1
sRXSPEC.bGainValid = 1
sRXSPEC.aFFT_SCALE[0].lRxChannel = 1
sRXSPEC.aFFT_SCALE[0].flFactor = 1.06857
sRXSPEC.aFFT_SCALE[0].bValid = 1
sRXSPEC.aFFT_SCALE[1].lRxChannel = 2
sRXSPEC.aFFT_SCALE[1].flFactor = 1.07454
sRXSPEC.aFFT_SCALE[1].bValid = 1
sRXSPEC.aFFT_SCALE[2].lRxChannel = 3
sRXSPEC.aFFT_SCALE[2].flFactor = 1.06622
sRXSPEC.aFFT_SCALE[2].bValid = 1
sRXSPEC.aFFT_SCALE[3].lRxChannel = 4
sRXSPEC.aFFT_SCALE[3].flFactor = 1.06524
sRXSPEC.aFFT_SCALE[3].bValid = 1
sRXSPEC.aFFT_SCALE[4].lRxChannel = 5
sRXSPEC.aFFT_SCALE[4].flFactor = 0.982692
sRXSPEC.aFFT_SCALE[4].bValid = 1
sRXSPEC.aFFT_SCALE[5].lRxChannel = 6
sRXSPEC.aFFT_SCALE[5].flFactor = 0.988603
sRXSPEC.aFFT_SCALE[5].bValid = 1
sRXSPEC.aFFT_SCALE[6].lRxChannel = 7
sRXSPEC.aFFT_SCALE[6].flFactor = 0.981538
sRXSPEC.aFFT_SCALE[6].bValid = 1
sRXSPEC.aFFT_SCALE[7].lRxChannel = 8
sRXSPEC.aFFT_SCALE[7].flFactor = 1.00856
sRXSPEC.aFFT_SCALE[7].bValid = 1
sRXSPEC.bVariCapVoltagesValid = 1
sRXSPEC.alDwellTime[0] = 8500
sAdjFreSpec.ulMode = 0x1
sAdjFreSpec.ucAdjWithBC = 0x1
sAdjTraSpec.ucAdjWithBC = 0x1
sAdjShimSpec.ulMode = 0x1
sAdjShimSpec.ucAdjWithBC = 0x1
sAdjWatSupSpec.ulMode = 0x1
sAdjWatSupSpec.ucAdjWithBC = 0x1
alTR[0] = 37000
lContrasts = 1
alTE[0] = 4000
acFlowComp[0] = 1
lCombinedEchoes = 1
sSliceArray.asSlice[0].sPosition.dSag = 35.31199581
sSliceArray.asSlice[0].sPosition.dCor = -8.387765754
sSliceArray.asSlice[0].sPosition.dTra = -23.13178296
sSliceArray.asSlice[0].sNormal.dSag = 0.771051253
sSliceArray.asSlice[0].sNormal.dCor = 0.5863890019
sSliceArray.asSlice[0].sNormal.dTra = -0.2482496801
sSliceArray.asSlice[0].dThickness = 6
sSliceArray.asSlice[0].dPhaseFOV = 187.5
sSliceArray.asSlice[0].dReadoutFOV = 250

```

```

sSliceArray.lSize           = 1
sSliceArray.lSag           = 1
sSliceArray.lConc          = 1
sSliceArray.ucMode         = 0x1
sSliceArray.sTSat.dThickness = 40
sSliceArray.sTSat.dGap     = 10
sGroupArray.asGroup[0].nSize = 1
sGroupArray.asGroup[0].dDistFact = 0.2
sGroupArray.anMember[1]    = -1
sGroupArray.lSize          = 1
sGroupArray.sPSat.dThickness = 50
sGroupArray.sPSat.dGap     = 10
sAutoAlign.dAAMatrix[0]    = 1
sAutoAlign.dAAMatrix[5]    = 1
sAutoAlign.dAAMatrix[10]   = 1
sAutoAlign.dAAMatrix[15]   = 1
sNavigatorPara.ucRespComp  = 0x4
sPrepPulses.ucFatSat       = 0x4
sPrepPulses.ucWaterSat     = 0x4
sPrepPulses.ucInversion    = 0x4
sPrepPulses.ucSatRecovery  = 0x1
sPrepPulses.ucFatSatMode   = 0x2
sKSpace.lBaseResolution    = 256
sKSpace.lPhaseEncodingLines = 192
sKSpace.dPhaseResolution    = 1
sKSpace.lPartitions        = 32
sKSpace.lImagesPerSlab     = 32
sKSpace.dSliceResolution    = 1
sKSpace.ucPhasePartialFourier = 0x10
sKSpace.ucSlicePartialFourier = 0x10
sKSpace.ucAveragingMode     = 0x2
sKSpace.ucMultiSliceMode    = 0x1
sKSpace.ucDimension         = 0x2
sKSpace.ucAsymmetricEchoAllowed = 0x1
sKSpace.unReordering        = 0x1
sFastImaging.lEPIFactor    = 1
sFastImaging.lTurboFactor  = 1
sFastImaging.lSegments     = 3
sFastImaging.ulEnableRFSpoiling = 0x1
sPhysioImaging.lSignal1    = 2
sPhysioImaging.lMethod1    = 2
sPhysioImaging.lSignal2    = 1
sPhysioImaging.lMethod2    = 1
sPhysioImaging.lPhases     = 21
sPhysioImaging.lRetroGatedImages = 16
sPhysioImaging.sPhysioECG.lScanWindow = 805
sPhysioImaging.sPhysioECG.lTriggerPulses = 1
sPhysioImaging.sPhysioECG.lTriggerWindow = 5
sPhysioImaging.sPhysioECG.lArrhythmiaDetection = 1
sPhysioImaging.sPhysioECG.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioECG.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioPulse.lTriggerPulses = 1
sPhysioImaging.sPhysioPulse.lTriggerWindow = 5
sPhysioImaging.sPhysioPulse.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioPulse.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioExt.lTriggerPulses = 1
sPhysioImaging.sPhysioExt.lTriggerWindow = 5
sPhysioImaging.sPhysioExt.lCardiacGateOnThreshold = 100000
sPhysioImaging.sPhysioExt.lCardiacGateOffThreshold = 700000
sPhysioImaging.sPhysioResp.lRespGateThreshold = 20
sPhysioImaging.sPhysioResp.lRespGatePhase = 2
sPhysioImaging.sPhysioResp.dGatingRatio = 0.3
sSpecPara.lPhaseCyclingType = 1
sSpecPara.lPhaseEncodingType = 1
sSpecPara.lRFExcitationBandwidth = 1
sSpecPara.ucRemoveOversampling = 0x1
sSpecPara.lDecouplingType = 1
sSpecPara.lNOEType = 1
sSpecPara.lExcitationType = 1
sSpecPara.lSpectralSuppression = 1
sDiffusion.ulMode = 0x1
sAngio.sFlowArray.asElm[0].nVelocity = 100
sAngio.sFlowArray.asElm[0].nDir = 0x4
sAngio.sFlowArray.lSize = 1
sAngio.ucPCFlowMode = 0x2
sAngio.ucTOFInflow = 0x4
sAngio.ucRephasedImage = 0x1
sAngio.ucPhaseImage = 0x1
sEllipticalFilter.ucMode = 0x1
sPat.lAccelFactPE = 1
sPat.lAccelFact3D = 1

```

```

sPat.ucPATMode                = 0x1
sPat.ucRefScanMode            = 0x1
ucAutoMovie                   = 0x1
ucDisableChangeStoreImages    = 0x1
ucReconstructionMode          = 0x1
ucPHAPSMODE                   = 0x1
ucDixon                       = 0x1
lAverages                     = 2
adFlipAngleDegree[0]          = 30
lScanTimeSec                  = 103
lTotalScanTimeSec             = 112
dRefSNR                       = 165404.1473
dRefSNR_VOI                   = 165404.1473
tdefaultEVAProt               = "%SiemensEvaDefProt%\Inline\Inline.evp"
tcurrentEVAProt               = "%CURRENTEVAPROT%\EVA2A5.tmp"
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[0].sCoilElementID.tElement = "PP6"
sCOIL_SELECT_MEAS.asList[0].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[0].lRxChannelConnected = 1
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[1].sCoilElementID.tElement = "PP5"
sCOIL_SELECT_MEAS.asList[1].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[1].lRxChannelConnected = 1
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[2].sCoilElementID.tElement = "PP3"
sCOIL_SELECT_MEAS.asList[2].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[2].lRxChannelConnected = 2
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[3].sCoilElementID.tElement = "PP4"
sCOIL_SELECT_MEAS.asList[3].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[3].lRxChannelConnected = 3
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[4].sCoilElementID.tElement = "PP2"
sCOIL_SELECT_MEAS.asList[4].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[4].lRxChannelConnected = 4
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.tCoilID = "6_Ch_Body_P"
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[5].sCoilElementID.tElement = "PP1"
sCOIL_SELECT_MEAS.asList[5].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[5].lRxChannelConnected = 4
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[6].sCoilElementID.tElement = "PA6"
sCOIL_SELECT_MEAS.asList[6].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[6].lRxChannelConnected = 5
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[7].sCoilElementID.tElement = "PA5"
sCOIL_SELECT_MEAS.asList[7].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[7].lRxChannelConnected = 5
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[8].sCoilElementID.tElement = "PA3"
sCOIL_SELECT_MEAS.asList[8].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[8].lRxChannelConnected = 6
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[9].sCoilElementID.tElement = "PA4"
sCOIL_SELECT_MEAS.asList[9].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[9].lRxChannelConnected = 7
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[10].sCoilElementID.tElement = "PA2"
sCOIL_SELECT_MEAS.asList[10].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[10].lRxChannelConnected = 8
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.tCoilID = "6_Ch_Body_A"
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.lCoilCopy = 1
sCOIL_SELECT_MEAS.asList[11].sCoilElementID.tElement = "PA1"
sCOIL_SELECT_MEAS.asList[11].lElementSelected = 1
sCOIL_SELECT_MEAS.asList[11].lRxChannelConnected = 8
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[0] = 0xff
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[1] = 0x76
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[2] = 0x78
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[3] = 0x87
sCOIL_SELECT_MEAS.sCOILPLUGS.aulPlugId[4] = 0x67
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNbOfNibbles[0] = 0x2

```



```

sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrofNibbles[1] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrofNibbles[2] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrofNibbles[3] = 0x2
sCOIL_SELECT_MEAS.sCOILPLUGS.auiNmbrofNibbles[4] = 0x2
sEFISPEC.bEFIDataValid = 1
### ASCCONV END ###
*/
/*
* Table of equivalence:
*
ulVersion = 0xbee332
<=>
27 - 'MrProtocolVersion' VM 1, VR IS, SyngoDT 6, NoOfItems 6, Data '12510002'
*/
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmCSAHeader.h"
#include "gdcmAttribute.h"
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include <map>
#include <math.h>
int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    gdcm::CSAHeader csa;
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    //const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
    const gdcm::PrivateTag &t2 = csa.GetCSASeriesHeaderInfoTag();
    if( ds.FindDataElement( t2 ) )
    {
        csa.LoadFromDataElement( ds.GetDataElement( t2 ) );
        //csa.Print( std::cout );
    }
    if( !csa.FindCSAElementByName( "MrProtocol" ) )
    {
        return 1;
    }
    const gdcm::CSAElement &csael = csa.GetCSAElementByName( "MrProtocol" );
    //std::cout << csael << std::endl;
    const gdcm::ByteValue *bv = csael.GetByteValue();
    if( !bv )
    {
        return 1;
    }
    std::string str(bv->GetPointer(), bv->GetLength());
    std::istringstream is(str);
    std::string s;
    typedef std::map< std::string, std::string > MyMapType;
    MyMapType mymap;
    while( std::getline(is, s ) )
    {
        std::string::size_type pos = s.find( '=' );
        if( pos != std::string::npos )
        {
            std::string sub1 = s.substr(0, pos);
            sub1.erase( sub1.find_last_not_of(' ') + 1);
            std::string sub2 = s.substr(pos+1); // skip the '=' char
            sub2.erase( 0, sub2.find_first_not_of(' '));
            //std::cout << sub1 << std::endl;
            mymap.insert( MyMapType::value_type(sub1, sub2) );
        }
        else
        {
            // ### ASCCONV BEGIN ###
            // ### ASCCONV END ###
        }
    }
    const char fourierstr[] = "sKSpace.ucSlicePartialFourier";
    const gdcm::CSAHeaderDict &csadict = gdcm::Global::GetInstance().GetDicts().GetCSAHeaderDict();
    const gdcm::CSAHeaderDictEntry &fourier = csadict.GetCSAHeaderDictEntry( fourierstr );

```

```

std::cout << "fourier" << std::endl;
MyMapType::const_iterator it = mymap.find ( "fourier" );
if( it == mymap.end() ) return 1;
//std::cout << it->second << std::endl;
const std::string &partial_fourier = it->second;
if( partial_fourier == "0x1" )
{
    std::cout << "partial fourier is 4/8" << std::endl;
}
else if( partial_fourier == "0x2" )
{
    std::cout << "partial fourier is 5/8" << std::endl;
}
else if( partial_fourier == "0x4" )
{
    std::cout << "partial fourier is 6/8" << std::endl;
}
else if( partial_fourier == "0x8" )
{
    std::cout << "partial fourier is 7/8" << std::endl;
}
else if( partial_fourier == "0x10" )
{
    std::cout << "partial fourier is 8/8" << std::endl;
}
else
{
    std::cerr << "Impossible: " << partial_fourier << std::endl;
    return 1;
}
}

/*
This is the Flip Angle:
adFlipAngleDegree[0] = 30

One can find it also in the protocol:

...
<ParamFunction> "TlmapFunction" >
{
<Class> "TlmapFunction@IceImagePostProcFunctors"

<ParamBool> "EXECUTE" { }
<ParamDouble> "Flip1_deg" { <Precision> 16 14.7378520000000000 }
...

*/
// Below is an attempt to play with the CSAHeader dict:
#if 0
const char gspec[] = "sGRADSPEC.flSensitivityX";
it = mymap.find( gspec );
if( it == mymap.end() ) return 1;
const std::string &dummy = it->second;
std::cout << dummy << std::endl;
const gdcm::CSAHeaderDictEntry &csaentry = csadict.GetCSAHeaderDictEntry( gspec );
std::cout << csaentry << std::endl;
#endif
/*
sSliceArray.ucMode -- should be in (1, 2, 4)
enum SeriesMode
{
    ASCENDING = 0x01,
    DESCENDING = 0x02,
    INTERLEAVED = 0x04
};
*/
const char sliceorderstr[] = "sSliceArray.ucMode";
const gdcm::CSAHeaderDictEntry &sliceorder = csadict.GetCSAHeaderDictEntry( sliceorderstr );
std::cout << sliceorder << std::endl;
it = mymap.find ( sliceorderstr );
if( it == mymap.end() ) return 1;
const std::string &slice_order = it->second;
if( slice_order == "0x1" )
{
    std::cout << "slice_order:  ASCENDING" << std::endl;
}
else if( slice_order == "0x2" )
{
    std::cout << "slice_order:  DESCENDING" << std::endl;
}
else if( slice_order == "0x4" )
{

```

```

        std::cout << "slice_order:  INTERLEAVED" << std::endl;
    }
    else
    {
        std::cerr << "Impossible:  " << slice_order << std::endl;
        return 1;
    }
    gdcm::MrProtocol mrprot;
    if( csa.GetMrProtocol(ds, mrprot) )
    {
        std::cout << mrprot << std::endl;
    }
    return 0;
}

```

## 12.84 PrintLUT.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
*/
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmImage.h"
#include "gdcmPhotometricInterpretation.h"
#include <iostream>
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " input.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    // Instantiate the image reader:
    gdcm::ImageReader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read:  " << filename << std::endl;
        return 1;
    }
    const gdcm::Image &image = reader.GetImage();
    const gdcm::LookupTable &lut = image.GetLUT();
    lut.Print( std::cout );
    return 0;
}

```

## 12.85 PublicDict.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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```

```

=====*/
/*
 * Dummy example to show GDCM Dict(s) API (Part 6) + Collected Private Attributes:
 */
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include "gdcmDict.h"
#include "gdcmCSAHeader.h"
#include "gdcmPrivateTag.h"
int main(int , char *[])
{
    const gdcm::Global& g = gdcm::Global::GetInstance(); // sum of all knowledge !
    const gdcm::Dicts &dicts = g.GetDicts();
    const gdcm::Dict &pub = dicts.GetPublicDict(); // Part 6
    //std::cout << pub << std::endl;
    // 3 different ways to access the same information
    // 1. From the public dict only:
    gdcm::Tag patient_name(0x10,0x10);
    const gdcm::DictEntry &entry1 = pub.GetDictEntry(patient_name);
    std::cout << entry1 << std::endl;
    // 2. From all dicts:
    const gdcm::DictEntry &entry2 = dicts.GetDictEntry(patient_name);
    std::cout << entry2 << std::endl;
    // 3. This solution is the most flexible solution as you can request using the same
    // API either a public tag or a private tag
    const char *strowner = nullptr;
    const gdcm::DictEntry &entry3 = dicts.GetDictEntry(patient_name,strowner);
    std::cout << entry3 << std::endl;
    // Private attributes:
    // try with a private tag now:
    const gdcm::PrivateTag &private_tag = gdcm::CSAHeader::GetCSAImageHeaderInfoTag();
    //std::cout << private_tag << std::endl;
    const gdcm::DictEntry &entry4 = dicts.GetDictEntry(private_tag,private_tag.GetOwner());
    std::cout << entry4 << std::endl;
    // Let's pretend that private lookup is on 0x10xx elements:
    gdcm::PrivateTag dummy = private_tag;
    dummy.SetElement( (uint16_t)(0x1000 + dummy.GetElement()) );
    const gdcm::DictEntry &entry5 = dicts.GetDictEntry(dummy,dummy.GetOwner());
    std::cout << entry5 << std::endl;
    return 0;
}

```

## 12.86 QIDO-RS.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmJSON.h"
/*
 * Simple QIDO-RS round-trip to test implementation of gdcm::JSON
 * See Supl66 for details
 */
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    using namespace gdcm;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() ) return 1;
    gdcm::JSON json;
    json.PrettyPrintOn();
    std::stringstream ss;
    const gdcm::File & f = reader.GetFile();
    json.Code( f.GetDataSet(), ss);
}

```

```

std::cout << ss.str() << std::endl;
gdcm::Writer w;
gdcm::File & ff = w.GetFile();
ff.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
if( !json.Decode(ss, ff.GetDataSet() ) )
{
    std::cerr << "Could not decode" << std::endl;
    return 1;
}
w.SetFileName( "/tmp/debug.dcm" );
if( !w.Write() ) return 1;
return 0;
}

```

## 12.87 ReadAndDumpDICOMDIR.cxx

```

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=====*/
/*
 * This example shows how to read and dump a DICOMDIR File
 *
 * Thanks:
 * Tom Marynowski (lordglub gmail) for contributing this example
 */
#include "gdcmReader.h"
#include "gdcmMediaStorage.h"
typedef std::set<gdcm::DataElement> DataElementSet;
typedef DataElementSet::const_iterator ConstIterator;
int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename);
    if( !reader.Read() )
    {
        std::cerr << "Could not read:  " << filename << std::endl;
        return 1;
    }
    std::stringstream strm;
    gdcm::File &file = reader.GetFile();
    gdcm::DataSet &ds = file.GetDataSet();
    gdcm::FileMetaInformation &fmi = file.GetHeader();
    gdcm::MediaStorage ms;
    ms.SetFromFile(file);
    if( ms != gdcm::MediaStorage::MediaStorageDirectoryStorage )
    {
        std::cout << "This file is not a DICOMDIR" << std::endl;
        return 1;
    }
    if (fmi.FindDataElement( gdcm::Tag (0x0002, 0x0002)))
    {
        strm.str("");
        fmi.GetDataElement( gdcm::Tag (0x0002, 0x0002) ).GetValue().Print(strm);
    }
    else
    {
        std::cerr << " Media Storage Sop Class UID not present" << std::endl;
    }
    //TODO il faut trimer strm.str() avant la comparaison au cas ou...
    if ("1.2.840.10008.1.3.10"!=strm.str())
    {
        std::cout << "This file is not a DICOMDIR" << std::endl;
        return 1;
    }
    ConstIterator it = ds.GetDES().begin();
    for( ; it != ds.GetDES().end(); ++it)

```

```

{
if (it->GetTag()==gdcm::Tag (0x0004, 0x1220))
{
const gdcm::DataElement &de = (*it);
// ne pas utiliser GetSequenceOfItems pour extraire les items
gdcm::SmartPointer<gdcm::SequenceOfItems> sqi =de.GetValueAsSQ();
unsigned int itemused = 1;
while (itemused<=sqi->GetNumberOfItems())
{
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
//TODO il faut trimer strm.str() avant la comparaison
while((strm.str()=="PATIENT")||((strm.str()=="PATIENT ")))
{
std::cout << strm.str() << std::endl;
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0010, 0x0010)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0010, 0x0010)).GetValue().Print(strm);
std::cout << "PATIENT NAME : " << strm.str() << std::endl;
//PATIENT ID
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0010, 0x0020)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0010, 0x0020)).GetValue().Print(strm);
std::cout << "PATIENT ID : " << strm.str() << std::endl;
/*ADD TAG TO READ HERE*/
std::cout << "===== " << std::endl;
itemused++;
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
//TODO il faut trimer strm.str() avant la comparaison
while((strm.str()=="STUDY")||((strm.str()=="STUDY ")))
{
std::cout << " " << strm.str() << std::endl;
//UID
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0020, 0x000d)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0020, 0x000d)).GetValue().Print(strm);
std::cout << " STUDY UID : " << strm.str() << std::endl;
//STUDY DATE
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x0020)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x0020)).GetValue().Print(strm);
std::cout << " STUDY DATE : " << strm.str() << std::endl;
//STUDY DESCRIPTION
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x1030)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x1030)).GetValue().Print(strm);
std::cout << " STUDY DESCRIPTION : " << strm.str() << std::endl;
/*ADD TAG TO READ HERE*/
std::cout << " " << "===== " << std::endl;
itemused++;
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
//TODO il faut trimer strm.str() avant la comparaison
while((strm.str()=="SERIES")||((strm.str()=="SERIES ")))
{
std::cout << " " << strm.str() << std::endl;
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0020, 0x000e)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0020, 0x000e)).GetValue().Print(strm);
std::cout << " SERIE UID" << strm.str() << std::endl;
//SERIE MODALITY
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x0060)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x0060)).GetValue().Print(strm);
std::cout << " SERIE MODALITY" << strm.str() << std::endl;
//SERIE DESCRIPTION
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0008, 0x103e)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0008, 0x103e)).GetValue().Print(strm);
std::cout << " SERIE DESCRIPTION" << strm.str() << std::endl;
/*ADD TAG TO READ HERE*/
std::cout << " " << "===== " << std::endl;
itemused++;
strm.str("");
if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
//TODO il faut trimer strm.str() avant la comparaison

```

```

while ((strm.str()=="IMAGE") || ((strm.str()=="IMAGE ") ||
// if(tmp=="IMAGE")
{
    std::cout << "          " << strm.str() << std::endl;
    //UID
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1511)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1511)).GetValue().Print(strm);
    std::cout << "          IMAGE UID : " << strm.str() << std::endl;
    //PATH de l'image
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1500)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1500)).GetValue().Print(strm);
    std::cout << "          IMAGE PATH : " << strm.str() << std::endl;
    /*ADD TAG TO READ HERE*/
    if(itemused < sqi->GetNumberOfItems())
    {itemused++;}
    else{break;}
    strm.str("");
    if (sqi->GetItem(itemused).FindDataElement(gdcm::Tag (0x0004, 0x1430)))
        sqi->GetItem(itemused).GetDataElement(gdcm::Tag (0x0004, 0x1430)).GetValue().Print(strm);
    }
}
}
}
itemused++;
}
}
}
return 0;
}

```

## 12.88 ReadAndDumpDICOMDIR2.cxx

/\*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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=====\*/

```

/*
 * This example shows how to read and dump a DICOMDIR File
 *
 * Thanks:
 *   Tom Marynowski (lordglub gmail) for contributing the original
 *   ReadAndDumpDICOMDIR.cxx example
 *   Mihail Isakov for contributing offset calculation code here:
 *   https://sourceforge.net/p/gdcm/mailman/gdcm-developers/?viewmonth=201707&viewday=15
 *   Tod Baudais for combining the above and cleaning up this example
 */
#include <string>
#include <unordered_map>
#include <iostream>
#include <memory>
#include "gdcmReader.h"
#include "gdcmAttribute.h"
#include "gdcmDirectory.h"
//=====
//=====
#define TAG_MEDIA_STORAGE_SOP_CLASS_UID 0x0002,0x0002
#define TAG_DIRECTORY_RECORD_SEQUENCE 0x0004,0x1220
#define TAG_DIRECTORY_RECORD_TYPE 0x0004,0x1430
#define TAG_PATIENTS_NAME 0x0010,0x0010
#define TAG_PATIENT_ID 0x0010,0x0020
#define TAG_STUDY_DATE 0x0008,0x0020
#define TAG_STUDY_DESCRIPTION 0x0008,0x1030
#define TAG_MODALITY 0x0008,0x0060
#define TAG_SERIES_DESCRIPTION 0x0008,0x103E
#define TAG_REFERENCED_FILE_ID 0x0004,0x1500
#define TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET 0x0004,0x1420

```

```

#define TAG_NEXT_DIRECTORY_RECORD_OFFSET 0x0004,0x1400
//=====
// Some handy utility functions
//=====
std::string left_trim(const std::string &s) {
    std::string ss(s);
    ss.erase(ss.begin(), std::find_if(ss.begin(), ss.end(), std::not1(std::ptr_fun<int, int>(std::isspace))));
    return ss;
}
std::string right_trim(const std::string &s) {
    std::string ss(s);
    ss.erase(std::find_if(ss.rbegin(), ss.rend(), std::not1(std::ptr_fun<int, int>(std::isspace))).base(),
        ss.end());
    return ss;
}
std::string trim(const std::string &s) {
    return left_trim(right_trim(s));
}
//=====
// This code could be put in a header file somewhere
//=====
class DICOMDIRReader {
public:
    DICOMDIRReader() {}
    DICOMDIRReader(const DICOMDIRReader &rhs) = delete;
    DICOMDIRReader(DICOMDIRReader &&rhs) = delete;
    DICOMDIRReader & operator = (const DICOMDIRReader &rhs) = delete;
    DICOMDIRReader & operator = (DICOMDIRReader &&rhs) = delete;
    virtual ~DICOMDIRReader() {}

public:
    struct Common {
        int64_t child_offset;
        int64_t sibling_offset;
    };
    struct Image: public Common {
        std::string path;
    };
    struct Series: public Common {
        std::string modality;
        std::string description;
        std::vector<std::shared_ptr<Image>> children;
    };
    struct Study: public Common {
        std::string date;
        std::string description;
        std::vector<std::shared_ptr<Series>> children;
    };
    struct Patient: public Common {
        std::string name;
        std::string id;
        std::vector<std::shared_ptr<Study>> children;
    };
    struct Other: public Common {
    };
    const std::vector<std::shared_ptr<Patient>> & load(const std::string &path);
    const std::vector<std::shared_ptr<Patient>> & patients(void) { return _patients; }

private:
    template <class T>
    std::string get_string(const T &ds, const gdcm::Tag &tag)
    {
        std::stringstream strm;
        if (ds.FindDataElement(tag)) {
            auto &de = ds.GetDataElement(tag);
            if (!de.IsEmpty() && !de.IsUndefinedLength())
                de.GetValue().Print(strm);
        }
        return trim(strm.str());
    }
    template <class P, class C, class O>
    void reassemble_hierarchy(P &parent_offsets, C &child_offsets, O &other_offsets)
    {
        for (auto &parent : parent_offsets) {
            int64_t sibling_offset;
            auto c = child_offsets[parent.second->child_offset];
            if (!c) {
                auto o = other_offsets[parent.second->child_offset];
                if (!o) {
                    continue;
                } else {
                    sibling_offset = o->sibling_offset;
                }
            }
        }
    }
};

```



```

    } else {
        parent.second->children.push_back(c);
        sibling_offset = c->sibling_offset;
    }
    // Get all siblings
    while (sibling_offset) {
        c = child_offsets[sibling_offset];
        if (!c) {
            auto o = other_offsets[sibling_offset];
            if (!o) {
                break;
            } else {
                sibling_offset = o->sibling_offset;
            }
        } else {
            parent.second->children.push_back(c);
            sibling_offset = c->sibling_offset;
        }
    }
}

std::vector<std::shared_ptr<Patient> > _patients;
};
//=====
// This code could be put in an implementation file somewhere
//=====
const std::vector<std::shared_ptr<DICOMDIRReader::Patient>> & DICOMDIRReader::load (const std::string &path)
{
    _patients.clear();
    //
    // Read the dataset from the DICOMDIR file
    //
    gdcm::Reader reader;
    reader.SetFileName(path.c_str());
    if(!reader.Read()) {
        throw std::runtime_error("Unable to read file");
    }
    // Retrieve information from file
    auto &file = reader.GetFile();
    auto &data_set = file.GetDataSet();
    auto &file_meta_information = file.GetHeader();
    // Retrieve and check the Media Storage class from file
    gdcm::MediaStorage media_storage;
    media_storage.SetFromFile(file);
    if(media_storage != gdcm::MediaStorage::MediaStorageDirectoryStorage) {
        throw std::runtime_error("This file is not a DICOMDIR");
    }
    auto media_storage_sop_class_uid = get_string(file_meta_information,
        gdcm::Tag(TAG_MEDIA_STORAGE_SOP_CLASS_UID));
    // Make sure we have a DICOMDIR file
    if (media_storage_sop_class_uid != "1.2.840.10008.1.3.10") {
        throw std::runtime_error("This file is not a DICOMDIR");
    }
    //
    // Offset to first item courtesy of Mihail Isakov
    //
    gdcm::VL first_item_offset = 0;
    auto it = data_set.Begin();
    for(; it != data_set.End() && it->GetTag() != gdcm::Tag(TAG_DIRECTORY_RECORD_SEQUENCE); ++it) {
        first_item_offset += it->GetLength<gdcm::ExplicitDataElement>();
    }
    // Tag (4 bytes)
    first_item_offset += it->GetTag().GetLength();
    // VR field
    first_item_offset += it->GetVR().GetLength();
    // VL field
    // For Explicit VR: adventitiously VL field lenght = VR field lenght,
    // for SQ 4 bytes:
    // http://dicom.nema.org/medical/dicom/current/output/html/part05.html#table_7.1-1
    first_item_offset += it->GetVR().GetLength();
    //
    // Iterate all data elements
    //
    // For each item in data set
    for(auto data_element : data_set.GetDES()) {
        // Only look at Directory sequence
        if (data_element.GetTag() != gdcm::Tag(TAG_DIRECTORY_RECORD_SEQUENCE))
            continue;
        auto item_sequence = data_element.GetValueAsSQ();
        auto num_items = item_sequence->GetNumberOfItems();
        //

```

```

// Compute an offset table
//
// Start calculation of offset to each item courtesy of Mihail Isakov
std::vector<int64_t> item_offsets(num_items+1);
item_offsets[0] = file_meta_information.GetFullLength() + static_cast<int64_t>(first_item_offset);
//
// Extract out all of the items
//
std::unordered_map<int64_t, std::shared_ptr<Patient>> patient_offsets;
std::unordered_map<int64_t, std::shared_ptr<Study>> study_offsets;
std::unordered_map<int64_t, std::shared_ptr<Series>> series_offsets;
std::unordered_map<int64_t, std::shared_ptr<Image>> image_offsets;
std::unordered_map<int64_t, std::shared_ptr<Other>> other_offsets;
for (uint32_t item_index = 1; item_index <= num_items; ++item_index) {
    auto &item = item_sequence->GetItem(item_index);
    // Add offset for item to offset table
    item_offsets[item_index] = item_offsets[item_index-1] + item.GetLength<gdcm::ExplicitDataElement>();
    // Child offset
    gdcm::Attribute<TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET> child_offset;
    child_offset.SetFromDataElement(item.GetDataElement(gdcm::Tag
(TAG_REFERENCED_LOWER_LEVEL_DIRECTORY_ENTITY_OFFSET)));
    // Sibling offset
    gdcm::Attribute<TAG_NEXT_DIRECTORY_RECORD_OFFSET> sibling_offset;
    sibling_offset.SetFromDataElement(item.GetDataElement(gdcm::Tag
(TAG_NEXT_DIRECTORY_RECORD_OFFSET)));
    // Record Type
    auto record_type = trim(get_string(item, gdcm::Tag (TAG_DIRECTORY_RECORD_TYPE)));
    // std::cout << "record_type " << record_type << " at " << item_offsets[item_index-1] << std::endl;
    // std::cout << " child_offset " << child_offset.GetValue() << std::endl;
    // std::cout << " sibling_offset " << sibling_offset.GetValue() << std::endl;
    // Extract patient information
    if (record_type == "PATIENT") {
        auto patient = std::make_shared<Patient>();
        patient->name = get_string(item, gdcm::Tag (TAG_PATIENTS_NAME));
        patient->id = get_string(item, gdcm::Tag (TAG_PATIENT_ID));
        patient->child_offset = child_offset.GetValue();
        patient->sibling_offset = sibling_offset.GetValue();
        patient_offsets[item_offsets[item_index-1]] = patient;
    // Extract study information
    } else if (record_type == "STUDY") {
        auto study = std::make_shared<Study>();
        study->date = get_string(item, gdcm::Tag (TAG_STUDY_DATE));
        study->description = get_string(item, gdcm::Tag (TAG_STUDY_DESCRIPTION));
        study->child_offset = child_offset.GetValue();
        study->sibling_offset = sibling_offset.GetValue();
        study_offsets[item_offsets[item_index-1]] = study;
    // Extract series information
    } else if (record_type == "SERIES") {
        auto series = std::make_shared<Series>();
        series->modality = get_string(item, gdcm::Tag (TAG_MODALITY));
        series->description = get_string(item, gdcm::Tag (TAG_SERIES_DESCRIPTION));
        series->child_offset = child_offset.GetValue();
        series->sibling_offset = sibling_offset.GetValue();
        series_offsets[item_offsets[item_index-1]] = series;
    // Extract image information
    } else if (record_type == "IMAGE") {
        auto image = std::make_shared<Image>();
        image->path = get_string(item, gdcm::Tag (TAG_REFERENCED_FILE_ID));
        image->child_offset = child_offset.GetValue();
        image->sibling_offset = sibling_offset.GetValue();
        image_offsets[item_offsets[item_index-1]] = image;
    } else {
        auto other = std::make_shared<Other>();
        other->child_offset = child_offset.GetValue();
        other->sibling_offset = sibling_offset.GetValue();
        other_offsets[item_offsets[item_index-1]] = other;
    }
}
// Check validity
if (patient_offsets.size() == 0)
    throw std::runtime_error("Unable to find patient record");
reassemble_hierarchy(series_offsets, image_offsets, other_offsets);
reassemble_hierarchy(study_offsets, series_offsets, other_offsets);
reassemble_hierarchy(patient_offsets, study_offsets, other_offsets);
// Set the new root
for (auto &patient : patient_offsets) {
    _patients.push_back(patient.second);
}
}
return _patients;
}

```

```
//=====
// Quick test
//=====
int main(int argc, const char *argv[]) {
    DICOMDIRReader reader;
    try {
        if (argc != 2)
            throw std::runtime_error("Wrong number of arguments");
        auto &patients = reader.load(argv[1]);
        for (auto &patient : patients) {
            std::cout << "PATIENT" << std::endl;
            std::cout << "NAME: " << patient->name << std::endl;
            std::cout << "ID: " << patient->id << std::endl;
            int x = 0;
            for (auto &study : patient->children) {
                std::cout << "    STUDY" << std::endl;
                std::cout << "        DESCRIPTION: " << study->description << std::endl;
                std::cout << "        DATE: " << study->date << std::endl;
                for (auto &series : study->children) {
                    x+=1;
                    std::cout << "            SERIES " << x << std::endl;
                    std::cout << "            DESCRIPTION: " << series->description << std::endl;
                    std::cout << "            MODALITY: " << series->modality << std::endl;
                    for (auto &image : series->children) {
                        std::cout << "                IMAGE PATH: " << image->path << std::endl;
                    }
                }
            }
        }
    }
    catch (...) {
        // TODO handle this
        return EXIT_FAILURE;
    }
    return EXIT_SUCCESS;
}
```

## 12.89 ReadAndPrintAttributes.cxx

```
/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * This small example will show how one can read and print
 * a DICOM Attribute using different technique (by tag or by name)
 */
#include "gdcmReader.h"
#include "gdcmGlobal.h"
#include "gdcmDicts.h"
#include "gdcmDict.h"
#include "gdcmAttribute.h"
#include "gdcmStringFilter.h"
#include <iostream>
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " input.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    // Instantiate the reader:
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Could not read: " << filename << std::endl;
    }
}
```

```

    return 1;
}
// The output of gdcm::Reader is a gdcm::File
gdcm::File &file = reader.GetFile();
// the dataset is the the set of element we are interested in:
gdcm::DataSet &ds = file.GetDataSet();
const gdcm::Global& g = gdcm::Global::GetInstance();
const gdcm::Dicts &dicts = g.GetDicts();
const gdcm::Dict &pubdict = dicts.GetPublicDict();
using namespace gdcm;
// In this example we will show why using name to lookup attribute can be
// dangerous.
Tag tPatientName(0x0,0x0);
//const DictEntry &de1 =
pubdict.GetDictEntryByName("Patient Name", tPatientName);
std::cout << "Found: " << tPatientName << std::endl;
// Indeed the attribute could not be found. Since DICOM 2003, Patient Name
// has become Patient's Name.
Tag tPatientsName;
//const DictEntry &de2 =
pubdict.GetDictEntryByName("Patient's Name", tPatientsName);
std::cout << "Found: " << tPatientsName << std::endl;
// Let's try to read an arbitrary DICOM Attribute:
Tag tDoseGridScaling;
//const DictEntry &de3 =
pubdict.GetDictEntryByName("Dose Grid Scaling", tDoseGridScaling);
std::cout << "Found: " << tDoseGridScaling << std::endl;
if( ds.FindDataElement( tDoseGridScaling ) )
{
    gdcm::StringFilter sf;
    sf.SetFile(file);
    std::cout << "Attribute Value as String: " << sf.ToString( tDoseGridScaling ) << std::endl;
    // Let's check the name again:
    std::pair<std::string, std::string> pss
        = sf.ToStringPair( tDoseGridScaling );
    std::cout << "Attribute Name Checked: " << pss.first << std::endl;
    std::cout << "Attribute Value (string): " << pss.second << std::endl;
    //const DataElement &dgs = ds.GetDataElement( tDoseGridScaling );
    // Let's assume for a moment we knew the tag number:
    Attribute<0x3004,0x000e> at;
    assert( at.GetTag() == tDoseGridScaling );
    at.SetFromDataSet( ds );
    // For the sake of long term maintenance, we will not write
    // that this particular attribute is stored as a double. What if
    // a user made a mistake. It is much safer to rely on GDCM internal
    // mechanism to deduce the VR::DS type (represented as a ieee double)
    Attribute<0x3004,0x000e>::ArrayType v = at.GetValue();
    std::cout << "DoseGridScaling=" << v << std::endl;
}
return 0;
}

```

## 12.90 ReadExplicitLengthSQIVR.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "gdcmReader.h"
#include "gdcmImplicitDataElement.h"
#include "gdcmDataSet.h"
#include "gdcmPrivateTag.h"
#include "gdcmPrivateTag.h"
#include "gdcmByteValue.h"
#include "gdcmSequenceOfItems.h"
using namespace gdcm;
int main(int argc, char *argv[])
{

```

```

if ( argc < 2 ) return 1;
const char *filename = argv[1];
gdcm::Reader r;
r.SetFileName( filename );
r.Read();
//gdcm::PrivateTag pt(0x01,0x42,"ELSCINT1");
//gdcm::Tag pt(0x88,0x200);
gdcm::Tag pt(0x8,0x1140);
DataSet &ds = r.GetFile().GetDataSet();
const DataElement &de = ds.GetDataElement( pt );
std::cout << de << std::endl;
const ByteValue *bv = de.GetByteValue();
SmartPointer<SequenceOfItems> sqi = new SequenceOfItems;
sqi->SetLength( bv->GetLength() );
std::stringstream ss;
ss.str( std::string( bv->GetPointer(), bv->GetLength() ) );
sqi->Read<ImplicitDataElement, SwapperNoOp>( ss );
std::cout << *sqi << std::endl;
return 0;
}

```

## 12.91 ReadGEMSSDO.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmDataElement.h"
#include "gdcmPrivateTag.h"
#include <iostream>
#include <string>
using namespace gdcm;
struct SDOElement
{
    typedef std::vector<std::string>::size_type SizeType;
    const char *GetData(SizeType index)const {
        return Data[index].c_str();
    }
    SizeType GetNumberOfData()const {
        return Data.size();
    }
    void SetData(SizeType index, const char *data) {
        Data[index] = data;
    }
    const char *GetDataFormat()const {
        return DataFormat.c_str();
    }
    void SetDataFormat(const char *dataformat, SizeType num) {
        DataFormat = dataformat;
        Data.resize( num );
    }
    void Print( std::ostream &os )const {
        os << DataFormat << ":" << std::endl;
        std::vector<std::string>::const_iterator it = Data.begin();
        size_t s = 0;
        for( ; it != Data.end(); ++it )
        {
            os << " (" << s++ << ") " << *it << std::endl;
        }
    }
private:
    std::string DataFormat;
    std::vector<std::string> Data;
};
class SDOHeader
{
public:

```

```

typedef std::vector<SDOElement> SDOElements;
typedef SDOElements::size_type SizeType;
SizeType GetNumberOfSDOElements()const {
    return InternalSDODataset.size();
}
void AddSDOElement(SDOElement const &sdoelement) {
    InternalSDODataset.push_back( sdoelement );
}
const SDOElement &GetSDOElement(SizeType index)const {
    return InternalSDODataset[index];
}
const SDOElement &GetSDOElementByName(const char *)const {
    return InternalSDODataset[0];
}
void LoadFromAttributes(std::string const &s1, std::string const &s2)
{
    std::string tok;
    std::string tok2;
    std::stringstream strstr(s1);
    std::stringstream strstr2(s2);
    SDOElement element;
    // Do format
    size_t count = 0;
    while ( std::getline ( strstr2, tok, '\\') )
    {
        //std::cout << tok << " ";
        std::getline ( strstr2, tok2, '\\' );
        //std::cout << tok2 << std::endl;
        count += atoi( tok2.c_str() );
        element.SetDataFormat( tok.c_str(), atoi( tok2.c_str() ) );
        for( size_t t = 0; t < element.GetNumberOfData(); ++t )
        {
            std::getline ( strstr, tok, '\\' );
            element.SetData(t, tok.c_str() );
        }
        AddSDOElement( element );
    }
    //while ( std::getline ( strstr, tok, '^' ) )
    // while ( std::getline ( strstr, tok, '\\' ) )
    // {
    //     std::cout << tok << std::endl;
    //     count++;
    // }
    // std::cout << "Count: " << count << std::endl;
    // count = 0;
    // std::cout << "Count: " << count << std::endl;
    }
void Print( std::ostream &os )const {
    SDOElements::const_iterator it = InternalSDODataset.begin();
    for( ; it != InternalSDODataset.end(); ++it )
    {
        it->Print ( os );
    }
}
private:
    SDOElements InternalSDODataset;
};
bool sdo_decode( DataElement const &stringdata, DataElement const &stringdataformat )
{
    const char *sd = stringdata.GetByteValue()->GetPointer();
    const size_t len_sd = stringdata.GetByteValue()->GetLength();
    std::string s1 = std::string( sd, len_sd );
    const char *sdf = stringdataformat.GetByteValue()->GetPointer();
    const size_t len_sdf = stringdataformat.GetByteValue()->GetLength();
    std::string s2 = std::string( sdf, len_sdf );
    // std::cout << s1 << std::endl;
    // std::cout << s2 << std::endl;
    SDOHeader header;
    header.LoadFromAttributes( s1, s2 );
    header.Print( std::cout );
    return true;
}
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " input.dcm" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    Reader reader;

```

```

reader.SetFileName( filename );
if( !reader.Read() )
{
    return 1;
}
File &file = reader.GetFile();
DataSet &ds = file.GetDataSet();
// StringData (0033,xx1F) 3 "GEMS_GENIE_1" List of SDO parameters stored as
// list of strings
const PrivateTag tstringdata(0x33,0x1f,"GEMS_GENIE_1");
// StringDataFormat (0033,xx23) 3 "GEMS_GENIE_1" Format of string parameters;
// contains information about name and number of strings in list
const PrivateTag tstringdataformat(0x33,0x23,"GEMS_GENIE_1");
if( !ds.FindDataElement( tstringdata ) ) return 1;
const DataElement& stringdata = ds.GetDataElement( tstringdata );
if( !ds.FindDataElement( tstringdataformat ) ) return 1;
const DataElement& stringdataformat = ds.GetDataElement( tstringdataformat );
sdo_decode( stringdata, stringdataformat );
return 0;
}

```

## 12.92 ReadMultiTimesException.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
// The intention of this sample program is to provoke bad_alloc exceptions in gdcm code
#include "gdcmImageReader.h"
int main(int argc, char* argv[])
{
    // We pre-allocate some memory (about 1Gb) to help the issue to show up earlier
    char *dummyBuffer = new char[1024*1024*1100]; (void)dummyBuffer;
    // Check the number of parameters given
    if (argc < 3)
    {
        std::cerr << "Usage:  " << argv[0] << " Filename numberOfTries" << std::endl;
        return 1;
    }
    std::cout << "We are going to read the file:  " << argv[1] << " " << argv[2] << " times" << std::endl;
    // We hold the pointers in an array to avoid the memory to be released
    // We read the input file n-times
    for (int i = 0; i < atoi(argv[2]); ++i)
    {
        gdcm::ImageReader reader;
        std::cout << "Reading try:  " << i << std::endl;
        // Read files
        reader.SetFileName(argv[1]);
        try
        {
            reader.Read();
            gdcm::Image &img = reader.GetImage();
            unsigned long len = img.GetBufferLength();
            char *buffer = new char[ len ];
            img.GetBuffer( buffer ); // do NOT de-allocate buffer !
        }
        catch (std::bad_alloc &ba)
        {
            (void)ba;
            std::cerr << "BAD ALLOC Exception caught!" << std::endl;
        }
        catch (...)
        {
            std::cerr << "Exception caught!" << std::endl;
        }
    }
    return 0;
}

```

## 12.93 ReadUTF8QtDir.cxx

```

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=====*/
/*
 * GDCM API expect a const char * as input for SetFileName
 * In order to use this API from Qt, here is a simple test that
 * shows how to do it in a portable manner:
 *
 * http://doc.qt.nokia.com/latest/qdir.html#navigation-and-directory-operations
 */
#include "gdcmReader.h"
#include "gdcmDirectory.h"
#include <QDir>
#include <QString>
#include <QCoreApplication>
#include <string>
#include <fstream>
#include <stdio.h> // fopen
static int TestBothFuncs(const char *info , const char *ba_str)
{
    int res = 0;
    FILE *f = fopen( ba_str, "r" );
    if( f )
    {
        std::cout << info << " fopen: " << ba_str << std::endl;
        fclose(f);
        ++res;
    }
    gdcm::Reader reader;
    std::ifstream is( ba_str, std::ios::binary );
    if( is.is_open() )
    {
        std::cout << info << " is_open: " << ba_str << std::endl;
        ++res;
    }
    reader.SetStream( is );
    if( reader.CanRead() == true )
    {
        std::cout << info << " SetStream/CanRead:" << ba_str << std::endl;
        ++res;
    }
    is.close();
    reader.SetFileName( ba_str );
    if( reader.CanRead() == true )
    {
        std::cout << info << " SetFileName/CanRead:" << ba_str << std::endl;
        ++res;
    }
    return 4 - res;
}
static int scanFolder(const char dirname[])
{
    int res = 0;
    gdcm::Directory dir;
    unsigned int nfiles = dir.Load( dirname, true );
    const gdcm::Directory::FileNamesType &filenames = dir.GetFileNames();
    for( unsigned int i = 0; i < nfiles; ++i )
    {
        const char *ba_str = filenames[i].c_str();
        res += TestBothFuncs("GDCM",ba_str);
    }
    return res;
}
static int scanFolderQt(QDir const &dir, QStringList& files)
{
    int res = 0;
    QFileInfoList children = dir.entryInfoList(QDir::AllEntries|QDir::NoDotAndDotDot);
    for ( int i=0; i<children.count(); i++ ) {

```



```

    QFileInfo file = children.at(i);
    if ( file.isDir() == true ) {
        res += scanFolderQt(QDir(file.absoluteFilePath()), files);
        continue;
    }
    // Convert back from the internal representation to 8bits
    // toLocal8Bit() returns by copy. Need to store explicitly the QByteArray
    QByteArray str = file.absoluteFilePath().toLocal8Bit();
    const char *ba_str1 = str.constData();
    res += TestBothFuncs("QString", ba_str1);
}
return res;
}
int main(int argc, char *argv[])
{
    // very important:
    QCoreApplication qCoreApp( argc , argv );
    if( argc < 2 )
    {
        std::cerr << argv[0] << " dir " << std::endl;
        return 1;
    }
    int res = 0;
    const char *dirname = argv[1];
    res += scanFolder( dirname );
    QDir dir( QString::fromLocal8Bit(dirname) );
    QStringList files;
    res += scanFolderQt( dir, files);
    if( res )
        std::cerr << "Problem with UTF-8" << std::endl;
    else
        std::cerr << "Success with UTF-8" << std::endl;
    return res;
}

```

## 12.94 SimpleScanner.cxx

```

/*=====

```

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```

=====*/

```

```

/*
 * Simple example to show how to use Scanner API.
 * It exposes the three different cases:
 * - DICOM Attribute is present and has a value
 * - DICOM Attribute is present and has no value
 * - DICOM Attribute is not present at all
 * It also shows the purpose of the function 'IsKey' to detect whether or
 * not the file has been read by the gdcm::Scanner. Technically most of the time
 * if a file is not a 'Key' this is because it is not a DICOM file. You need to use
 * gdcm::System::FileExists to decide whether or not the file actually exist on the disk.
 *
 * It was tested on this particular image:
 * ./SimpleScanner gdcmData/012345.002.050.dcm
 */
#include "gdcmStrictScanner.h"
#include "gdcmSimpleSubjectWatcher.h"
#include "gdcmFileNameEvent.h"
class MyFileWatcher : public gdcm::SimpleSubjectWatcher
{
public:
    MyFileWatcher(gdcm::Subject * s, const char *comment = ""):
        gdcm::SimpleSubjectWatcher(s,comment){}
    void ShowFileName(gdcm::Subject *, const gdcm::Event &evt) override
    {
        const gdcm::FileNameEvent &pe = dynamic_cast<const gdcm::FileNameEvent>&(evt);
        const char *fn = pe.GetFileName();
        std::cout << "FileName: " << fn << " FileSize: " << gdcm::System::FileSize( fn ) << std::endl;
    }
}

```

```

    }
};
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        return 1;
    }
    const char *filename = argv[1];
    const char filename_invalid[] = "this is a file that may not exist on this disk.dcm";
    gdcm::SmartPointer<gdcm::StrictScanner> sp = new gdcm::StrictScanner;
    gdcm::StrictScanner &s = *sp;
    //gdcm::SimpleSubjectWatcher w(&s, "TestFileName" );
    MyFileWatcher w(&s, "TestFileName" );
    const gdcm::Tag tag_array[] = {
        gdcm::Tag(0x8,0x50),
        gdcm::Tag(0x8,0x51),
        gdcm::Tag(0x8,0x60),
        gdcm::Tag(0x8,0x80),
    };
    s.AddTag( tag_array[0] );
    s.AddTag( tag_array[1] );
    s.AddTag( tag_array[2] );
    s.AddTag( tag_array[3] );
    gdcm::Directory::FileNamesType filenames;
    filenames.push_back( filename );
    filenames.push_back( filename_invalid );
    if( !s.Scan( filenames ) )
    {
        return 1;
    }
    //s.Print( std::cout );
    for(gdcm::Directory::FileNamesType::const_iterator it = filenames.begin();
        it != filenames.end(); ++it )
    {
        if( s.IsKey( it->c_str() ) )
        {
            std::cout << "INFO:" << it->c_str() << " is a proper Key for the Scanner (this is a DICOM file)" << std::endl;
        }
        else
        {
            std::cout << "INFO:" << it->c_str() << " is not a proper Key for the Scanner (this is either not a DICOM file
            or file does not exist)" << std::endl;
        }
    }
    gdcm::StrictScanner::TagToValue const &ttv = s.GetMapping(filename);
    const gdcm::Tag *ptag = tag_array;
    for( ; ptag != tag_array + 3; ++ptag )
    {
        gdcm::StrictScanner::TagToValue::const_iterator it = ttv.find( *ptag );
        if( it != ttv.end() )
        {
            std::cout << *ptag << " was properly found in this file" << std::endl;
            // it contains a pair of value.  the first one is the actual tag, so the following is always true:
            // *ptag == it->first
            // The second part is the actual value (stored as RAW strings).  You will have to reinterpret this string
            // if VR for *ptag is not VR:VRASCII !
            const char *value = it->second;
            if( *value )
            {
                std::cout << " It has the value: " << value << std::endl;
            }
            else
            {
                std::cout << " It has no value (empty)" << std::endl;
            }
        }
        else
        {
            std::cout << "Sorry " << *ptag << " could not be found in this file" << std::endl;
        }
    }
    return 0;
}

```

## 12.95 SortImage.cxx

```

/*=====

```

```

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=====*/
/*
*/
#include "gdcmSorter.h"
#include "gdcmScanner.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
bool mysort(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    //gdcm::Attribute<0x0020,0x0013> at1; // Instance Number
    gdcm::Attribute<0x0018,0x1060> at1; // Trigger Time
    gdcm::Attribute<0x0020,0x0032> at11; // Image Position (Patient)
    at1.Set( ds1 );
    at11.Set( ds1 );
    //gdcm::Attribute<0x0020,0x0013> at2;
    gdcm::Attribute<0x0018,0x1060> at2;
    gdcm::Attribute<0x0020,0x0032> at22;
    at2.Set( ds2 );
    at22.Set( ds2 );
    if( at11 == at22 )
    {
        return at1 < at2;
    }
    return at11 < at22;
}
bool mysort_part1(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0018,0x1060> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0018,0x1060> at2;
    at2.Set( ds2 );
    return at1 < at2;
}
bool mysort_part2(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x0032> at1;
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x0032> at2;
    at2.Set( ds2 );
    return at1 < at2;
}
// technically all files are in the same Frame of Reference, so this function
// should be a no-op
bool mysort_dummy(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x0052> at1; // FrameOfReferenceUID
    at1.Set( ds1 );
    gdcm::Attribute<0x0020,0x0052> at2;
    at2.Set( ds2 );
    return at1 < at2;
}
int main(int argc, char *argv[])
{
    if (argc < 2 ) return 1;
    const char *dirname = argv[1];
    gdcm::Directory dir;
    unsigned int nfiles = dir.Load( dirname );
    dir.Print( std::cout );
    gdcm::Sorter sorter;
    sorter.SetSortFunction( mysort );
    sorter.Sort( dir.GetFilesNames() );
    std::cout << "Sorter:" << std::endl;
    sorter.Print( std::cout );
    gdcm::Sorter sorter2;
    sorter2.SetSortFunction( mysort_part1 );
    sorter2.StableSort( dir.GetFilesNames() );
    sorter2.SetSortFunction( mysort_part2 );
    sorter2.StableSort( sorter2.GetFilesNames() ); // IMPORTANT
    sorter2.SetSortFunction( mysort_dummy );
    sorter2.StableSort( sorter2.GetFilesNames() ); // IMPORTANT
}

```

```

std::cout << "Sorter2:" << std::endl;
sorter2.Print( std::cout );
gdcmm::Scanner s;
s.AddTag( gdcmm::Tag(0x20,0x32) ); // Image Position (Patient)
//s.AddTag( gdcmm::Tag(0x20,0x37) ); // Image Orientation (Patient)
s.Scan( dir.GetFilesNames() );
//s.Print( std::cout );
// Count how many different IPP there are:
const gdcmm::Scanner::ValuesType &values = s.GetValues();
size_t nvalues = values.size();
std::cout << "There are " << nvalues << " different type of values" << std::endl;
//std::cout << "nfiles=" << nfiles << std::endl;
if( nfiles % nvalues != 0 )
{
    std::cerr << "Impossible: this is a not a proper series" << std::endl;
    return 1;
}
std::cout << "Series is composed of " << (nfiles/nvalues) << " different 3D volumes" << std::endl;
return 0;
}

```

## 12.96 StreamImageReaderTest.cxx

```

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```

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```

=====*/
// This work was realised during the GSOC 2011 by Manoj Alwani
#include "gdcmmStreamImageReader.h"
#include "gdcmmFileMetaInformation.h"
#include "gdcmmSystem.h"
#include "gdcmmFilename.h"
#include "gdcmmByteSwap.h"
#include "gdcmmTrace.h"
#include "gdcmmTesting.h"
#include "gdcmmImageHelper.h"
#include "gdcmmImageReader.h"
#include "gdcmmImage.h"
#include "gdcmmMediaStorage.h"
#include "gdcmmRAWCodec.h"
#include "gdcmmJPEGLSCodec.h"
#include "gdcmmUIDGenerator.h"
#include "gdcmmStreamImageWriter.h"
#include "gdcmmAttribute.h"
#include "gdcmmFile.h"
#include "gdcmmTag.h"
bool StreamImageRead(gdcmm::StreamImageWriter & theStreamWriter,
    const char* filename, const char* outfilename, int resolution)
{
    gdcmm::StreamImageReader reader;
    reader.SetFileName( filename );
    if (!reader.ReadImageInformation())
    {
        std::cerr << "unable to read image information" << std::endl;
        return 1; //unable to read tags as expected.
    }
    //let's be tricky; each image will be read in portions, first the top half, then the bottom
    //that way, we can test how the stream handles fragmentation of the data
    //we could also loop this to get various different size combinations, but I'm not sure
    //that's useful, yet.
    std::vector<unsigned int> extent =
        gdcmm::ImageHelper::GetDimensionsValue(reader.GetFile());
    // std::cout << extent[0];
    //at this point, these values aren't used, but may be in the future
    //unsigned short xmin = 0;
    //unsigned short xmax = extent[0];
    //unsigned short ymin = 0;
    //unsigned short ymax = extent[1];
}

```

```

//unsigned short zmin = 0;
//unsigned short zmax = extent[2];
std::cout<< "\n Row:  " << extent[0] << "\n Col : " << extent[1] << "\n Resolution : " << extent[2] << std::endl;
int a = 1;
for (int i=1; i<=(extent[2]-resolution);++i)
    a = a*2;
reader.DefinePixelExtent(0, extent[0]/a, 0, extent[1]/a, resolution-1, resolution);
unsigned long len = reader.DefineProperBufferLength();
char* finalBuffer = new char[len];
memset(finalBuffer, 0, sizeof(char)*len);
if (reader.CanReadImage())
{
    bool result = reader.Read(finalBuffer, len);
    if( !result )
    {
        std::cout << "res2 failure:" << filename << std::endl;
        delete [] finalBuffer;
        return 1;
    }
    else
    {
        std::cout<< "Able to read";
    }
}
else
{
    std::cerr<< "Not able to put in buffer" << std::endl;
}
}
/*
//now, read in smaller buffer extents
reader.DefinePixelExtent(xmin, xmax, ymin, ymax);
len = reader.DefineProperBufferLength();

char* buffer = new char[len];
bool res2 = reader.Read(buffer, len);
if( !res2 ){
std::cerr << "res2 failure:" << filename << std::endl;
return 1;
}
//copy the result into finalBuffer
memcpy(finalBuffer, buffer, len);

//now read the next half of the image
ymin = ymax;
ymax = extent[1];

reader.DefinePixelExtent(xmin, xmax, ymin, ymax);

//std::cerr << "Success to read image from file:  " << filename << std::endl;
unsigned long len2 = reader.DefineProperBufferLength();

char* buffer2 = new char[len2];
bool res3 = reader.Read(buffer2, len2);
if( !res3 ){
std::cerr << "res3 failure:" << filename << std::endl;
return 1;
}
//copy the result into finalBuffer
memcpy(&(finalBuffer[len]), buffer2, len2);

delete [] buffer;
delete [] buffer2;
*/
gdcm::Writer w;
gdcm::File &file = w.GetFile();
gdcm::DataSet &ds = file.GetDataSet();
file.GetHeader().SetDataSetTransferSyntax( gdcm::TransferSyntax::ExplicitVRLittleEndian );
gdcm::UIDGenerator uid;
gdcm::DataElement de( gdcm::Tag(0x8,0x18) ); // SOP Instance UID
de.SetVR( gdcm::VR::UI );
const char *u = uid.Generate();
de.SetByteValue( u, strlen(u) );
ds.Insert( de );
gdcm::DataElement del( gdcm::Tag(0x8,0x16) );
del.SetVR( gdcm::VR::UI );
gdcm::MediaStorage ms( gdcm::MediaStorage::VLWholeSlideMicroscopyImageStorage );
del.SetByteValue( ms.GetString(), strlen(ms.GetString()) );
ds.Insert( del );
const char mystr[] = "MONOCHROME2 ";
gdcm::DataElement de2( gdcm::Tag(0x28,0x04) );
//de.SetTag(gdcm::Tag(0x28,0x04));

```

```

de2.SetVR( gdc::VR::CS );
de2.SetByteValue(mystr, strlen(mystr));
ds.Insert( de2 );
gdc::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
ds.Insert( Number_Of_Frames.GetAsDataElement() );
gdc::Attribute<0x0028,0x0010> row = {extent[0]/a};//
ds.Insert( row.GetAsDataElement() );
gdc::Attribute<0x0028,0x0011> col = {extent[1]/a};//
ds.Insert( col.GetAsDataElement() );
gdc::Attribute<0x0028,0x0100> at = {8};
ds.Insert( at.GetAsDataElement() );
gdc::Attribute<0x0028,0x0002> at1 = {1};//
ds.Insert( at1.GetAsDataElement() );
gdc::Attribute<0x0028,0x0101> at2 = {8};
ds.Insert( at2.GetAsDataElement() );
gdc::Attribute<0x0028,0x0102> at3 = {7};
ds.Insert( at3.GetAsDataElement() );
/*
ds1.Remove( gdc::Tag(0x0028,0x0008) );

gdc::Attribute<0x0028,0x0008> Number_Of_Frames = {1};
ds1.Insert( Number_Of_Frames.GetAsDataElement() );
*/
theStreamWriter.SetFile(file);
if (!theStreamWriter.WriteImageInformation())
{
    std::cerr << "unable to write image information" << std::endl;
    return 1; //the CanWrite function should prevent getting here, else,
    //that's a test failure
}
std::vector<unsigned int> extent1 = gdc::ImageHelper::GetDimensionsValue(file);
unsigned short xmax = extent1[0];
unsigned short ymax = extent1[1];
unsigned short theChunkSize = 1;
unsigned short ychunk = extent1[1]/theChunkSize; //go in chunk sizes of theChunkSize
unsigned short zmax = 1;
std::cout << "\n Row: " << extent1[0] << "\n Col : " << extent1[1] << "\n Resolution : " << extent1[2] << std::endl;
if (xmax == 0 || ymax == 0)
{
    std::cerr << "Image has no size, unable to write zero-sized image." << std::endl;
    return 0;
}
int z, y, nexty;
unsigned long prevLen = 0; //when going through the char buffer, make sure to grab
//the bytes sequentially. So, store how far you got in the buffer with each iteration.
for (z = 0; z < zmax; ++z){
    for (y = 0; y < ymax; y += ychunk){
        nexty = y + ychunk;
        if (nexty > ymax) nexty = ymax;
        theStreamWriter.DefinePixelExtent(0, xmax, y, nexty, z, z+1);
        unsigned long len = theStreamWriter.DefineProperBufferLength();
        std::cout << "\n" << len;
        char* finalBuffer1 = new char[len];
        memcpy(finalBuffer1, &(finalBuffer[prevLen]), len);
        std::cout << "\nable to write";
        if (!theStreamWriter.Write(finalBuffer1, len)){
            std::cerr << "writing failure:" << "output.dcm" << " at y = " << y << " and z = " << z << std::endl;
            delete [] finalBuffer1;
            delete [] finalBuffer;
            return 1;
        }
        delete [] finalBuffer1;
        prevLen += len;
    }
}
delete [] finalBuffer;
std::cout << "all is set";
return true;
}
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm Resolution" << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    const char *outfilename = argv[2];
    char *res = argv[3];
    int resolution = atoi(res);
    gdc::StreamWriter theStreamWriter;

```

```

std::ofstream of;
of.open( outfile, std::ios::out | std::ios::binary );
theStreamWriter.SetStream(of);
// else
// First of get rid of warning/debug message
gdcm::Trace::DebugOn();
gdcm::Trace::WarningOn();
if(!StreamImageRead( theStreamWriter, filename, outfile, resolution))
    return 1;
uint16_t firstTag1 = 0xffff;
uint16_t secondTag1 = 0xe0dd;
uint32_t thirdTag1 = 0x00000000;
//uint16_t fourthTag1 = 0xffff;
const int theBufferSize1 = 2*sizeof(uint16_t)+sizeof(uint32_t);
char* tmpBuffer2 = new char[theBufferSize1];
memcpy(&(tmpBuffer2[0]), &firstTag1, sizeof(uint16_t));
memcpy(&(tmpBuffer2[sizeof(uint16_t)]), &secondTag1, sizeof(uint16_t));
memcpy(&(tmpBuffer2[2*sizeof(uint16_t)]), &thirdTag1, sizeof(uint32_t));
//memcpy(&(tmpBuffer2[3*sizeof(uint16_t)]), &fourthTag1, sizeof(uint16_t));
assert( of && !of.eof() && of.good() );
of.write(tmpBuffer2, theBufferSize1);
of.flush();
assert( of );
return 0;
}

```

## 12.97 TemplateEmptyImage.cxx

```

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=====*/
#include "gdcmFileStreamer.h"
#include "gdcmTag.h"
#include "gdcmTrace.h"
#include "gdcmImageRegionReader.h"
#include "gdcmImageHelper.h"
#include "gdcmWriter.h"
#include "gdcmImageWriter.h"
#include "gdcmTagKeywords.h"
#include "gdcmUIDGenerator.h"
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    const char * filename = argv[1];
    gdcm::ImageRegionReader irr;
    irr.SetFileName( filename );
    const bool b3 = irr.ReadInformation();
    std::cout << b3 << std::endl;
    gdcm::Image & img = irr.GetImage();
    std::cout << img << std::endl;
    // const gdcm::Region & r = irr.GetRegion();
    // std::cout << r << std::endl;
    gdcm::ImageWriter w;
    gdcm::File & file = w.GetFile();
    gdcm::DataSet & ds = file.GetDataSet();
    gdcm::UIDGenerator uid;
    namespace kwd = gdcm::Keywords;
    kwd::FrameOfReferenceUID frameref;
    frameref.SetValue( uid.Generate() );
    // ContentDate
    char date[22];
    const size_t datelen = 8;
    int res = gdcm::System::GetCurrentDateTime(date);
    (void)res;
    kwd::ContentDate contentdate;
    // Do not copy the whole cstring:
    contentdate.SetValue( gdcm::DComp( date, datelen ) );
}

```

```

ds.Insert( contentdate.GetAsDataElement() );
// ContentTime
const size_t timelen = 6 + 1 + 6; // time + milliseconds
kwd::ContentTime contenttime;
// Do not copy the whole cstring:
contenttime.SetValue( gdcm::TMComp(date+datelen, timelen) );
ds.Insert( contenttime.GetAsDataElement() );
gdcm::MediaStorage ms0 = w.ComputeTargetMediaStorage();
std::cout << ms0 << std::endl;
kwd::SeriesNumber seriesnumber = { 1 };
kwd::InstanceNumber instancenumber = { 1 };
kwd::StudyID studyid = { "St1" };
kwd::PatientID patientid = { "P1" };
kwd::SOPClassUID sopclassuid;
kwd::PositionReferenceIndicator pri;
//kwd::Laterality lat;
//kwd::BodyPartExamined bodypartex = { "HEAD" };
kwd::BodyPartExamined bodypartex = { "ANKLE" };
kwd::PatientOrientation pator;
kwd::BurnedInAnnotation bia = { "NO" };
kwd::ConversionType convtype = { "SYN" };
kwd::PresentationLUTShape plutshape = { "IDENTITY" }; // MONOCHROME2
// gdcm will pick the Word in case Byte class is not compatible:
gdcm::MediaStorage ms = gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage;
sopclassuid.SetValue( ms.GetString() );
ds.Insert( instancenumber.GetAsDataElement() );
ds.Insert( sopclassuid.GetAsDataElement() );
ds.Insert( seriesnumber.GetAsDataElement() );
ds.Insert( patientid.GetAsDataElement() );
ds.Insert( studyid.GetAsDataElement() );
ds.Insert( frameref.GetAsDataElement() );
ds.Insert( pri.GetAsDataElement() );
//ds.Insert( lat.GetAsDataElement() );
ds.Insert( bodypartex.GetAsDataElement() );
ds.Insert( pator.GetAsDataElement() );
ds.Insert( bia.GetAsDataElement() );
ds.Insert( convtype.GetAsDataElement() );
ds.Insert( plutshape.GetAsDataElement() );
// gdcm::MediaStorage ms1 = w.ComputeTargetMediaStorage();
// std::cout << ms1 << std::endl;
std::cout << ds << std::endl;
gdcm::PixelFormat & pf = img.GetPixelFormat();
pf.SetPixelRepresentation(0); // always overwrite
img.SetSlope(1);
img.SetIntercept(0);
w.SetImage( img );
w.SetFileName( "TemplateImage.dcm" );
if( !w.Write() )
{
    return 1;
}
return 0;
}

```

## 12.98 TraverseModules.cxx

```

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=====*/
*/
#include "gdcmDefs.h"
#include "gdcmGlobal.h"
#include "gdcmIODs.h"
#include "gdcmIOD.h"
#include "gdcmMacros.h"

```



```

#include "gdcmIODEntry.h"
#include "gdcmModules.h"
#include "gdcmModule.h"
#include "gdcmAnonymizer.h"
#include "gdcmDicts.h"
int main(int , char *[])
{
    using namespace gdcm;
    static Global &g = Global::GetInstance();
    if( !g.LoadResourcesFiles() )
    {
        return 1;
    }
    static const Defs &defs = g.GetDefs();
    static const Modules &modules = defs.GetModules();
    static const IODs &iods = defs.GetIODs();
    static const Macros &macros = defs.GetMacros();
    static const Dicts &dicts = g.GetDicts();
    std::vector<Tag> tags = gdcm::Anonymizer::GetBasicApplicationLevelConfidentialityProfileAttributes();
    for( std::vector<Tag>::const_iterator tit = tags.begin(); tit != tags.end(); ++tit )
    {
        const Tag &tag = *tit;
        const DictEntry &dictentry = dicts.GetDictEntry(tag);
        std::cout << "Processing Attribute: " << tag << " " << dictentry << std::endl;
        IODs::IODMapTypeConstIterator it = iods.Begin();
        for( ; it != iods.End(); ++it )
        {
            const IODs::IODName &name = it->first;
            const IOD &iod = it->second;
            const size_t niods = iod.GetNumberOfIODs();
            // Iterate over each iod entry in order:
            for(unsigned int idx = 0; idx < niods; ++idx)
            {
                const IODEntry &iodentry = iod.GetIODEntry(idx);
                const char *ref = iodentry.GetRef();
                //Usage::UsageType ut = iodentry.GetUsageType();
                const Module &module = modules.GetModule( ref );
                if( module.FindModuleEntryInMacros(macros, tag) )
                {
                    const ModuleEntry &module_entry = module.GetModuleEntryInMacros(macros,tag);
                    Type type = module_entry.GetType();
                    std::cout << "IOD Name: " << name << std::endl;
                    std::cout << "Type: " << type << std::endl;
                }
            }
        }
    }
    return 0;
}

```

## 12.99 VolumeSorter.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
*/
#include "gdcmSorter.h"
#include "gdcmIPPSorter.h"
#include "gdcmScanner.h"
#include "gdcmDataSet.h"
#include "gdcmAttribute.h"
#include "gdcmTesting.h"
bool mysort1(gdcm::DataSet const & ds1, gdcm::DataSet const & ds2 )
{
    gdcm::Attribute<0x0020,0x000d> at1;
    at1.Set( ds1 );

```

```

    gdcM::Attribute<0x0020,0x000d> at2;
    at2.Set( ds2 );
    return at1 < at2;
}
bool mysort2(gdcM::DataSet const & ds1, gdcM::DataSet const & ds2 )
{
    gdcM::Attribute<0x0020,0x000e> at1;
    at1.Set( ds1 );
    gdcM::Attribute<0x0020,0x000e> at2;
    at2.Set( ds2 );
    return at1 < at2;
}
bool mysort3(gdcM::DataSet const & ds1, gdcM::DataSet const & ds2 )
{
    // This is a floating point number is the comparison ok ?
    gdcM::Attribute<0x0020,0x0037> at1;
    at1.Set( ds1 );
    gdcM::Attribute<0x0020,0x0037> at2;
    at2.Set( ds2 );
    return at1 < at2;
}
bool mysort4(gdcM::DataSet const & ds1, gdcM::DataSet const & ds2 )
{
    // Do the IPP sorting here
    gdcM::Attribute<0x0020,0x0032> iop1;
    gdcM::Attribute<0x0020,0x0037> iop1;
    iop1.Set( ds1 );
    iop1.Set( ds1 );
    gdcM::Attribute<0x0020,0x0032> iop2;
    gdcM::Attribute<0x0020,0x0037> iop2;
    iop2.Set( ds2 );
    iop2.Set( ds2 );
    if( iop1 != iop2 )
    {
        return false;
    }
    // else
    double normal[3];
    normal[0] = iop1[1]*iop1[5] - iop1[2]*iop1[4];
    normal[1] = iop1[2]*iop1[3] - iop1[0]*iop1[5];
    normal[2] = iop1[0]*iop1[4] - iop1[1]*iop1[3];
    double dist1 = 0;
    for( int i = 0; i < 3; ++i) dist1 += normal[i]*iop1[i];
    double dist2 = 0;
    for( int i = 0; i < 3; ++i) dist2 += normal[i]*iop2[i];
    std::cout << dist1 << ", " << dist2 << std::endl;
    return dist1 < dist2;
}
int main(int argc, char *argv[])
{
    const char *extradataroot = gdcM::Testing::GetDataExtraRoot();
    std::string dir1;
    if( argc < 2 )
    {
        if( !extradataroot )
        {
            return 1;
        }
        dir1 = extradataroot;
        dir1 += "/gdcMSampleData/ForSeriesTesting/VariousIncidences/ST1";
    }
    else
    {
        dir1 = argv[1];
    }
    gdcM::Directory d;
    d.Load( dir1.c_str(), true ); // recursive !
    const gdcM::Directory::FileNamesType &ll = d.GetFilesNames();
    const size_t nfiles = ll.size();
    std::cout << nfiles << std::endl;
    //if( nfiles != 280 )
    // {
    //     return 1;
    // }
    //d.Print( std::cout );
    gdcM::Scanner s0;
    const gdcM::Tag t1(0x0020,0x000d); // Study Instance UID
    const gdcM::Tag t2(0x0020,0x000e); // Series Instance UID
    //const gdcM::Tag t3(0x0010,0x0010); // Patient's Name
    s0.AddTag( t1 );
    s0.AddTag( t2 );

```

```

//s0.AddTag( t3 );
//s0.AddTag( t4 );
//s0.AddTag( t5 );
//s0.AddTag( t6 );
bool b = s0.Scan( d.GetFileNames() );
if( !b )
{
    std::cerr << "Scanner failed" << std::endl;
    return 1;
}
//s0.Print( std::cout );
// Only get the DICOM files:
gdcm::Directory::FileNamesType l2 = s0.GetKeys();
const size_t nfiles2 = l2.size();
std::cout << nfiles2 << std::endl;
if ( nfiles2 > nfiles )
{
    return 1;
}
gdcm::Sorter sorter;
sorter.SetSortFunction( mysort1 );
sorter.StableSort( l2 );
sorter.SetSortFunction( mysort2 );
sorter.StableSort( sorter.GetFileNames() );
sorter.SetSortFunction( mysort3 );
sorter.StableSort( sorter.GetFileNames() );
sorter.SetSortFunction( mysort4 );
sorter.StableSort( sorter.GetFileNames() );
//sorter.Print( std::cout );
// Let's try to check our result:
// assume that IPP is precise enough so that we can test floating point equality:
size_t nvalues = 0;
{
    gdcm::Scanner s;
    s.AddTag( gdcm::Tag(0x20,0x32) ); // Image Position (Patient)
    //s.AddTag( gdcm::Tag(0x20,0x37) ); // Image Orientation (Patient)
    s.Scan( d.GetFileNames() );
    //s.Print( std::cout );
    const gdcm::Scanner::ValuesType &values = s.GetValues();
    nvalues = values.size();
    std::cout << "There are " << nvalues << " different type of values" << std::endl;
    assert( nfiles2 % nvalues == 0 );
    std::cout << "Series is composed of " << (nfiles/nvalues) << " different 3D volumes" << std::endl;
}
gdcm::Directory::FileNamesType sorted_files = sorter.GetFileNames();
// Which means we can take nvalues files at a time and execute gdcm::IPPSorter on it:
gdcm::IPPSorter ippsorter;
gdcm::Directory::FileNamesType sub( sorted_files.begin(), sorted_files.begin() + nvalues);
std::cout << sub.size() << std::endl;
std::cout << sub[0] << std::endl;
std::cout << sub[nvalues-1] << std::endl;
ippsorter.SetComputeZSpacing( false );
if( !ippsorter.Sort( sub ) )
{
    std::cerr << "Could not sort" << std::endl;
    return 1;
}
std::cout << "IPPSorter:" << std::endl;
ippsorter.Print( std::cout );
return 0;
}

```

## 12.100 csa2img.cxx

```

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=====*/

```

```

/*
 * I do not know what the format is, just guessing from info found on the net:
 *
 * http://atonal.ucdavis.edu/matlab/fmri/spm5/spm_dicom_convert.m
 *
 * This example is an attempt at understanding the format used by SIEMENS
 * their "SIEMENS CSA NON-IMAGE" DICOM file (1.3.12.2.1107.5.9.1)
 *
 * Everything done in this code is for the sole purpose of writing interoperable
 * software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
 * If you believe anything in this code violates any law or any of your rights,
 * please contact us (gdcm-developers@lists.sourceforge.net) so that we can
 * find a solution.
 */
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmImageWriter.h"
#include "gdcmCSAHeader.h"
#include "gdcmAttribute.h"
#include "gdcmPrivateTag.h"
#include <math.h>
int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    // gdcmDataExtra/gdcmNonImageData/exCSA_Non-Image_Storage.dcm
    // PHANTOM.MR.CARDIO_COEUR_S_SEQUENCE_DE_REP_RANGE.9.257.2008.03.20.14.53.25.578125.43151705.IMA
    const char *filename = argv[1];
    gdcm::Reader reader; // Do not use ImageReader
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    gdcm::CSAHeader csa;
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    const gdcm::PrivateTag &t1 = csa.GetCSAImageHeaderInfoTag();
    //std::cout << t1 << std::endl;
    //const gdcm::PrivateTag &t2 = csa.GetCSASeriesHeaderInfoTag();
    if( ds.FindDataElement( t1 ) )
    {
        csa.LoadFromDataElement( ds.GetDataElement( t1 ) );
        csa.Print( std::cout );
    }
    int dims[2] = {};
    if( csa.FindCSAElementByName( "Columns" ) )
    {
        const gdcm::CSAElement &csael = csa.GetCSAElementByName( "Columns" );
        std::cout << csael << std::endl;
        //const gdcm::ByteValue *bv = csael.GetByteValue();
        gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el;
        el.Set( csael.GetValue() );
        dims[0] = el.GetValue();
        std::cout << "Columns:" << el.GetValue() << std::endl;
    }
    if( csa.FindCSAElementByName( "Rows" ) )
    {
        const gdcm::CSAElement &csael2 = csa.GetCSAElementByName( "Rows" );
        std::cout << csael2 << std::endl;
        gdcm::Element<gdcm::VR::IS, gdcm::VM::VM1> el2;
        el2.Set( csael2.GetValue() );
        dims[1] = el2.GetValue();
        std::cout << "Rows:" << el2.GetValue() << std::endl;
    }
    double spacing[2] = { 1. , 1. };
    bool spacingfound = false;
    if( csa.FindCSAElementByName( "PixelSpacing" ) )
    {
        const gdcm::CSAElement &csael3 = csa.GetCSAElementByName( "PixelSpacing" );
        if( !csael3.IsEmpty() )
        {
            std::cout << csael3 << std::endl;
            gdcm::Element<gdcm::VR::DS, gdcm::VM::VM2> el3;
            el3.Set( csael3.GetValue() );
            spacing[0] = el3.GetValue(0);
            spacing[1] = el3.GetValue(1);
            std::cout << "PixelSpacing:" << el3.GetValue() << "," << el3.GetValue(1) << std::endl;
            spacingfound = true;
        }
    }
}

```

```

if( !spacingfound )
{
    std::cerr << "Problem with PixelSpacing" << std::endl;
    //return 1;
}
if( !dims[0] || !dims[1] )
{
    std::cerr << "Problem with dims" << std::endl;
    return 1;
}
gdcm::ImageWriter writer;
gdcm::Image &image = writer.GetImage();
image.SetNumberOfDimensions( 2 ); // good default
image.SetDimension(0, dims[0] );
image.SetDimension(1, dims[1] );
image.SetSpacing(0, spacing[0] );
image.SetSpacing(1, spacing[1] );
gdcm::PixelFormat pixeltype = gdcm::PixelFormat::INT16; // bytewidth = spm_type('int16','bits')/8;
//unsigned long l = image.GetBufferLength();
//const int p = 1 / (dims[0] * dims[1]);
//image.SetNumberOfDimensions( 3 );
//image.SetDimension(2, p / pixeltype.GetPixelSize() );
gdcm::PhotometricInterpretation pi;
pi = gdcm::PhotometricInterpretation::MONOCHROME2;
//pixeltype.SetSamplesPerPixel( );
image.SetPhotometricInterpretation( pi );
image.SetPixelFormat( pixeltype );
//image.SetIntercept( inputimage.GetIntercept() );
//image.SetSlope( inputimage.GetSlope() );
//gdcm::DataElement pixeldata( gdcm::Tag(0x7fe1,0x1010) );
//pixeldata.SetByteValue( &outbuf[0], outbuf.size() );
gdcm::PrivateTag csanonimaget(0x7fe1,0x10,"SIEMENS CSA NON-IMAGE");
const gdcm::DataElement &pixeldata = ds.GetDataElement( csanonimaget );
image.SetDataElement( pixeldata );
std::string outfilename = "outcsa.dcm";
//writer.SetFile( reader.GetFile() );
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
{
    std::cerr << "could not write: " << outfilename << std::endl;
    return 1;
}
return 0;
}

```

## 12.101 iU22tomultisc.cxx

```

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```

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```

=====*/
/*
 * iU22 Raw Data extractor
 */
#include "gdcmReader.h"
#include "gdcmImageWriter.h"
#include "gdcmAttribute.h"
#include "gdcmPrivateTag.h"
#include <math.h>
int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    // IM_001
    const char *filename = argv[1];
    gdcm::Reader reader; // Do not use ImageReader
    reader.SetFileName( filename );
    if( !reader.Read() )
    {

```

```

        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    // * The data is simply 8-bit unsigned in the obvious x/y/z order
    // * 200D,300B contains the data
    // * 200D,3001 contains the no. of voxels (416,412,256 in this case)
    // * 200D,3003 contains the voxel sizes (0.156184527398215 /
    // 0.1223749613981957 / 0.328479990704639 in this case)
    const gdcm::File &file = reader.GetFile();
    const gdcm::DataSet &ds = file.GetDataSet();
    const gdcm::PrivateTag trawdataus( 0x200d, 0x0b, "Philips US Imaging DD 033" );
    const gdcm::DataElement &rawdataus = ds.GetDataElement( trawdataus );
    const gdcm::PrivateTag tcolsrowsframes( 0x200d, 0x01, "Philips US Imaging DD 036" );
    const gdcm::DataElement &colsrowsframes = ds.GetDataElement( tcolsrowsframes );
    // const gdcm::PrivateTag tcolsrowsframes( 0x200d, 0x02, "Philips US Imaging DD 036" );
    // this is just a duplicate previous tag.
    const gdcm::PrivateTag tvoxelspacing( 0x200d, 0x03, "Philips US Imaging DD 036" );
    const gdcm::DataElement &voxelspacing = ds.GetDataElement( tvoxelspacing );
    gdcm::Element<gdcm::VR::DS, gdcm::VM::VM3> dims; // Use DS to interpret value stored in LO
    dims.SetFromDataElement( colsrowsframes );
    gdcm::Element<gdcm::VR::DS, gdcm::VM::VM3> spacing;
    spacing.SetFromDataElement( voxelspacing );
    gdcm::ImageWriter writer;
    gdcm::Image &image = writer.GetImage();
    image.SetNumberOfDimensions( 3 ); // good default
    image.SetDimension(0, (unsigned int)dims[0] );
    image.SetDimension(1, (unsigned int)dims[1] );
    image.SetDimension(2, (unsigned int)dims[2] );
    image.SetSpacing(0, spacing[0] );
    image.SetSpacing(1, spacing[1] );
    image.SetSpacing(2, spacing[2] );
    gdcm::PixelFormat pixeltype = gdcm::PixelFormat::UINT8;
    gdcm::PhotometricInterpretation pi;
    pi = gdcm::PhotometricInterpretation::MONOCHROME2;
    image.SetPhotometricInterpretation( pi );
    image.SetPixelFormat( pixeltype );
    image.SetDataElement( rawdataus );
    std::string outfilename = "outiu22.dcm";
    gdcm::DataElement de( gdcm::Tag(0x8,0x16) ); // SOP Class UID
    de.SetVR( gdcm::VR::UI );
    gdcm::MediaStorage ms(
        gdcm::MediaStorage::UltrasoundMultiFrameImageStorage );
    // gdcm::MediaStorage::MultiframeGrayscaleByteSecondaryCaptureImageStorage );
    de.SetByteValue( ms.GetString(), (uint32_t)strlen(ms.GetString()) );
    writer.GetFile().GetDataSet().Replace( de );
    writer.SetFileName( outfilename.c_str() );
    if( !writer.Write() )
    {
        std::cerr << "could not write: " << outfilename << std::endl;
        return 1;
    }
    return 0;
}

```

## 12.102 pmsct\_rgb1.cxx

```

/*=====

```

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```

=====*/
/*
 * This example shows how to rewrite a ELSCINT1/PMSCT_RGB1 compressed
 * image so that it is readable by most 3rd party software (DICOM does
 * not specify this particular encoding).
 * This is required for the sake of interoperability with any standard
 * conforming DICOM system.
 *
 * Everything done in this code is for the sole purpose of writing interoperable

```

```

* software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
* If you believe anything in this code violates any law or any of your rights,
* please contact us (gdcm-developers@lists.sourceforge.net) so that we can
* find a solution.
*
* Everything you do with this code is at your own risk, since decompression
* algorithm was not written from specification documents.
*
* Special thanks to:
* Jean-Pierre Roux for providing the sample datasets
*/
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
void delta_decode(const unsigned char *data_in, size_t data_size,
    std::vector<unsigned char> &new_stream, unsigned short pc, size_t w, size_t h)
{
    const size_t plane_size = h * w;
    const size_t outputlen = 3 * plane_size;
    new_stream.resize( outputlen );
    assert( data_size != outputlen );
    if( data_size == outputlen )
    {
        return;
    }
    typedef unsigned char byte;
    enum {
        COLORMODE = 0x81,
        ESCMODE = 0x82,
        REPEATMODE = 0x83
    };
    const byte* src = (const byte*)data_in;
    byte* dest = (byte*)&new_stream[0];
    union { byte gray; byte rgb[3]; } pixel;
    pixel.rgb[0] = pixel.rgb[1] = pixel.rgb[2] = 0;
    // always start in grayscale mode
    bool graymode = true;
    size_t dx = 1;
    size_t dy = 3;
    // algorithm works with both planar configuration
    // It does produce surprising greenish background color for planar
    // configuration is 0, while the nested Icon SQ display a nice black
    // background
    if (pc)
    {
        dx = plane_size;
        dy = 1;
    }
    size_t ps = plane_size;
    // The following is highly unoptimized as we have nested if statement in a while loop
    // we need to switch from one algorithm to ther other (RGB <-> GRAY)
    while (ps)
    {
        // next byte:
        byte b = *src++;
        assert( src < data_in + data_size );
        // mode selection:
        switch ( b )
        {
            case ESCMODE:
                // Used to treat a byte 81/82/83 as a normal byte
                if (graymode)
                {
                    pixel.gray += *src++;
                    dest[0*dx] = pixel.gray;
                    dest[1*dx] = pixel.gray;
                    dest[2*dx] = pixel.gray;
                }
                else
                {
                    pixel.rgb[0] += *src++;
                    pixel.rgb[1] += *src++;
                    pixel.rgb[2] += *src++;
                    dest[0*dx] = pixel.rgb[0];
                    dest[1*dx] = pixel.rgb[1];
                    dest[2*dx] = pixel.rgb[2];
                }
                dest += dy;
                ps--;
                break;

```

```

case REPEATMODE:
    // repeat mode (RLE)
    b = *src++;
    ps -= b;
    if (graymode)
    {
        while (b-- > 0)
        {
            dest[0*dx] = pixel.gray;
            dest[1*dx] = pixel.gray;
            dest[2*dx] = pixel.gray;
            dest += dy;
        }
    }
    else
    {
        while (b-- > 0)
        {
            dest[0*dx] = pixel.rgb[0];
            dest[1*dx] = pixel.rgb[1];
            dest[2*dx] = pixel.rgb[2];
            dest += dy;
        }
    }
    break;
case COLORMODE:
    // We are swithing from one mode to the other. The stream contains an intermixed
    // compression of RGB codec and GRAY codec. Each one not knowing of the other
    // reset old value to 0.
    if (graymode)
    {
        graymode = false;
        pixel.rgb[0] = pixel.rgb[1] = pixel.rgb[2] = 0;
    }
    else
    {
        graymode = true;
        pixel.gray = 0;
    }
    break;
default:
    // This is identical to ESCMODE, it would be nicer to use fall-through
    if (graymode)
    {
        pixel.gray += b;
        dest[0*dx] = pixel.gray;
        dest[1*dx] = pixel.gray;
        dest[2*dx] = pixel.gray;
    }
    else
    {
        pixel.rgb[0] += b;
        pixel.rgb[1] += *src++;
        pixel.rgb[2] += *src++;
        dest[0*dx] = pixel.rgb[0];
        dest[1*dx] = pixel.rgb[1];
        dest[2*dx] = pixel.rgb[2];
    }
    dest += dy;
    ps--;
    break;
} // end switch
} // end while
}

int main(int argc, char *argv [])
{
    if( argc < 2 ) return 1;
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    // (07a1,1011) CS [PMSC_T_RGB1] # 10,1 Tamar Compression Type
    const gdcm::PrivateTag tcompressiontype(0x07a1,0x0011,"ELSCINT1");
    if( !ds.FindDataElement( tcompressiontype ) ) return 1;
    const gdcm::DataElement& compressiontype = ds.GetDataElement( tcompressiontype );
    if ( compressiontype.IsEmpty() ) return 1;

```



```

const gdcm::ByteValue * bv = compressiontype.GetByteValue();
std::string comprle = "PMSCT_RLE1";
std::string comprgb = "PMSCT_RGB1";
bool isrle = false;
bool isrgb = false;
if( strcmp( bv->GetPointer(), comprle.c_str(), comprle.size() ) == 0 )
{
    isrle = true;
    return 1;
}
if( strcmp( bv->GetPointer(), comprgb.c_str(), comprgb.size() ) == 0 )
{
    isrgb = true;
}
if( !isrgb && !isrle ) return 1;
const gdcm::PrivateTag tcompressedpixeldata(0x07a1,0x000a,"ELSCINT1");
if( !ds.FindDataElement( tcompressedpixeldata ) ) return 1;
const gdcm::DataElement& compressionpixeldata = ds.GetDataElement( tcompressedpixeldata);
if( compressionpixeldata.IsEmpty() ) return 1;
const gdcm::ByteValue * bv2 = compressionpixeldata.GetByteValue();
gdcm::Attribute<0x0028,0x0006> at0;
at0.SetFromDataSet( ds );
gdcm::Attribute<0x0028,0x0010> at1;
at1.SetFromDataSet( ds );
gdcm::Attribute<0x0028,0x0011> at2;
at2.SetFromDataSet( ds );
std::vector<unsigned char> buffer;
delta_decode((const unsigned char*)bv2->GetPointer(), bv2->GetLength(), buffer,
    at0.GetValue(), at1.GetValue(), at2.GetValue() );
gdcm::DataElement pixeldata( gdcm::Tag(0x7fe0,0x0010) );
pixeldata.SetVR( gdcm::VR::OW );
pixeldata.SetByteValue( (char*)&buffer[0], (uint32_t)buffer.size() );
// TODO we should check that decompress byte buffer match the expected size (row*col*...)
// Add the pixel data element
reader.GetFile().GetDataSet().Replace( pixeldata );
reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
gdcm::Writer writer;
writer.SetFile( reader.GetFile() );
// Cleanup stuff:
// remove the compressed pixel data:
// FIXME: should I remove more private tags ? all of them ?
// oh well this is just an example
// use gdcm::Anonymizer::RemovePrivateTags if needed...
writer.GetFile().GetDataSet().Remove( compressionpixeldata.GetTag() );
std::string outfilename;
if( argc > 2)
    outfilename = argv[2];
else
    outfilename = "outrgb.dcm";
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
{
    std::cerr << "Failed to write" << std::endl;
    return 1;
}
std::cout << "success !" << std::endl;
return 0;
}

```

## 12.103 rle2img.cxx

```

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=====*/
/*
* This example shows how to rewrite a ELSCINT1/PMSCT_RLE1 compressed

```

```

* image so that it is readable by most 3rd party software (DICOM does
* not specify this particular encoding).
* This is required for the sake of interoperability with any standard
* conforming DICOM system.
*
* Everything done in this code is for the sole purpose of writing interoperable
* software under Sect. 1201 (f) Reverse Engineering exception of the DMCA.
* If you believe anything in this code violates any law or any of your rights,
* please contact us (gdcm-developers@lists.sourceforge.net) so that we can
* find a solution.
*
* Everything you do with this code is at your own risk, since decompression
* algorithm was not written from specification documents.
*
* Special thanks to:
* Mauro Maiorca for bringing to our attention on this new ELSCINT1
* compression algorithm : PMSCT_RLE1 (different from the 'LOSSLESS RICE')
* See post at:
* http://groups.google.com/group/comp.protocols.dicom/msg/f2b99bf706a7f8ca
*
* Thanks to Jesus Spinola, for more datasets,
* http://www.itk.org/pipermail/insight-users/2008-April/025571.html
*
* And last but not least, a very big thank to Ivo van Poorten, without
* whom we would still be looking at this compressed byte stream as if
* it was RLE compressed.
*/
#include "gdcmReader.h"
#include "gdcmPrivateTag.h"
#include "gdcmAttribute.h"
#include "gdcmImageWriter.h"
/* FIXME: Why is PhilipsLosslessRice.dcm a 512x512 image ... */
void delta_decode(const char *inbuffer, size_t length, std::vector<unsigned short> &output)
{
    // RLE pass
    std::vector<char> temp;
    for(size_t i = 0; i < length; ++i)
    {
        if( inbuffer[i] == (char)0xa5 )
        {
            //unsigned char repeat = (unsigned char)inbuffer[i+1] + 1;
            //assert( (unsigned char)inbuffer[i+1] != 255 );
            int repeat = (unsigned char)inbuffer[i+1] + 1;
            char value = inbuffer[i+2];
            while(repeat)
            {
                temp.push_back( value );
                --repeat;
            }
            i+=2;
        }
        else
        {
            temp.push_back( inbuffer[i] );
        }
    }
    // Delta encoding pass
    unsigned short delta = 0;
    for(size_t i = 0; i < temp.size(); ++i)
    {
        if( temp[i] == 0x5a )
        {
            unsigned char v1 = (unsigned char)temp[i+1];
            unsigned char v2 = (unsigned char)temp[i+2];
            unsigned short value = (unsigned short)(v2 * 256 + v1);
            output.push_back( value );
            delta = value;
            i+=2;
        }
        else
        {
            unsigned short value = (unsigned short)(temp[i] + delta);
            output.push_back( value );
            delta = value;
        }
    }
    //assert( output[output.size()-1] == ref[output.size()-1] );
}
if ( output.size() % 2 )
{
    output.resize( output.size() - 1 );
}

```

```

    std::cout << length << " -> " << output.size() * 2 << std::endl;
}
int main(int argc, char *argv [])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << "input.dcm [output.dcm]" << std::endl;
        std::cerr << "will default to 'out.rle.dcm' unless output.dcm is specified."
            << std::endl;
        return 1;
    }
    const char *filename = argv[1];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        std::cerr << "Failed to read: " << filename << std::endl;
        return 1;
    }
    const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
    // (07a1,1011) CS [PMSCT_RLE1] # 10,1 Tamar Compression Type
    const gdcm::PrivateTag tcompressiontype(0x07a1,0x0011,"ELSCINT1");
    if( !ds.FindDataElement( tcompressiontype ) ) return 1;
    const gdcm::DataElement& compressiontype = ds.GetDataElement( tcompressiontype );
    if( compressiontype.IsEmpty() ) return 1;
    const gdcm::ByteValue * bv = compressiontype.GetByteValue();
    std::string comprle = "PMSCT_RLE1";
    std::string comprgb = "PMSCT_RGB1";
    bool isrle = false;
    bool isrgb = false;
    if( strcmp( bv->GetPointer(), comprle.c_str(), comprle.size() ) == 0 )
    {
        isrle = true;
    }
    if( strcmp( bv->GetPointer(), comprgb.c_str(), comprgb.size() ) == 0 )
    {
        isrgb = true;
        std::cerr << "See: pmsct_rgb1.cxx instead" << std::endl;
        return 1;
    }
    if( !isrgb && !isrle ) return 1;
    // check if compressed pixel data reside in private or standard tag
    const gdcm::PrivateTag tprivatepixeldata(0x07a1,0x100a,"ELSCINT1");
    const gdcm::Tag tstandardpixeldata(0x7fe0, 0x0010);
    gdcm::Tag tpixeldata;
    if(ds.FindDataElement(tprivatepixeldata)) tpixeldata = tprivatepixeldata;
    else if(ds.FindDataElement(tstandardpixeldata)) tpixeldata = tstandardpixeldata;
    if(!ds.FindDataElement(tpixeldata)) return 1;
    const gdcm::DataElement& compressionpixeldata = ds.GetDataElement( tpixeldata );
    if( compressionpixeldata.IsEmpty() ) return 1;
    const gdcm::ByteValue * bv2 = compressionpixeldata.GetByteValue();
    gdcm::Attribute<0x0028,0x0010> at1;
    at1.SetFromDataSet( ds );
    gdcm::Attribute<0x0028,0x0011> at2;
    at2.SetFromDataSet( ds );
    gdcm::DataElement pixeldata;
    // if standard voxel data element does not exist, create it
    if( !reader.GetFile().GetDataSet().FindDataElement( tpixeldata ) )
    {
        pixeldata = gdcm::DataElement( tpixeldata, 0, gdcm::VR::OW );
    }
    else{
        pixeldata = reader.GetFile().GetDataSet().GetDataElement( tpixeldata );
    }
    pixeldata.SetVR( gdcm::VR::OW );
    gdcm::VL bv2l = bv2->GetLength();
    gdcm::VL at1l = at1.GetValue() * at2.GetValue() * 2; /* sizeof(unsigned short) == 2 */
    // Handle special case that is not compressed:
    if( bv2l == at1l )
    {
        pixeldata.SetByteValue( bv2->GetPointer(), bv2->GetLength() );
    }
    else
    {
        std::vector<unsigned short> buffer;
        delta_decode(bv2->GetPointer(), bv2->GetLength(), buffer);
        pixeldata.SetByteValue( (char*)&buffer[0], (uint32_t)(buffer.size() * sizeof( unsigned short )) );
    }
    // TODO we should check that decompress byte buffer match the expected size (row*col*...)
    // Add the pixel data element
    if( reader.GetFile().GetDataSet().FindDataElement( tpixeldata ) )

```

```

{
    reader.GetFile().GetDataSet().Replace( pixeldata );
}
else
{
    reader.GetFile().GetDataSet().ReplaceEmpty( pixeldata );
}
reader.GetFile().GetHeader().SetDataSetTransferSyntax(
    gdcm::TransferSyntax::ExplicitVRLittleEndian);
gdcm::Writer writer;
writer.SetFile( reader.GetFile() );
// Cleanup stuff:
// This makes the code equivalent to Philips workstation IntelliSpace Portal
if( writer.GetFile().GetDataSet().FindDataElement( tcompressiontype ) )
{
    writer.GetFile().GetDataSet().Remove( gdcm::Tag(0x07a1,0x1011) );
}
if( writer.GetFile().GetDataSet().FindDataElement( tprivatepixeldata ) )
{
    writer.GetFile().GetDataSet().Remove( gdcm::Tag(0x07a1,0x100a) );
}
std::string outfilename;
if( argc > 2)
    outfilename = argv[2];
else
    outfilename = "outfile.dcm";
writer.SetFileName( outfilename.c_str() );
if( !writer.Write() )
{
    std::cerr << "Failed to write" << std::endl;
    return 1;
}
std::cout << "success !" << std::endl;
return 0;
}

```

## 12.104 uid\_unique.cxx

```

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
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=====*/
#include "gdcmUIDGenerator.h"
#include <iostream>
#include <string>
#include <set>
int main()
{
    gdcm::UIDGenerator uid;
    //const char myroot[] = "9876543210.9876543210.9876543210.9876543210.9876543210"; // fails in ~40000 tries
    const char myroot[] = "9876543210.9876543210.9876543210";
    uid.SetRoot( myroot );
    std::set<std::string> uids;
    uint64_t wrap = 0;
    uint64_t c = 0;
    while(true)
    {
        const char *unique = uid.Generate();
        //std::cout << unique << std::endl;
        if( c % 10000 == 0 )
        {
            std::cout << "wrap=" << wrap << ",c=" << c << std::endl;
        }
        ++c;
        if( c == 0 )
        {
            wrap++;
        }
    }
}

```

```

    if ( uids.count(unique) == 1 )
    {
        std::cerr << "Failed with: " << unique << std::endl;
        return 1;
    }
    uids.insert( unique );
}
}

```

## 12.105 DecompressImage.java

```

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PURPOSE. See the above copyright notice for more information.

=====*/
/*
 * This example will take in a DICOM file, and tries to decompress it (actually write it
 * as ImplicitVRLittleEndian Transfer Syntax).
 *
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/DecompressImage.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java DecompressImage gdcmData/012345.002.050.dcm out.dcm
 */
import gdcm.*;
public class DecompressImage
{
    public static void main(String[] args) throws Exception
    {
        String file1 = args[0];
        String file2 = args[1];
        ImageReader reader = new ImageReader();
        reader.SetFileName( file1 );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read: " + file1 );
        }
        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetTransferSyntax( new TransferSyntax(TransferSyntax.TType.ImplicitVRLittleEndian) );
        change.SetInput( reader.GetImage() );
        if( !change.Change() )
        {
            throw new Exception("Could not change: " + file1 );
        }
        Image out = change.GetOutput();
        System.out.println( out.toString() );
        // Set the Source Application Entity Title
        FileMetaInformation.SetSourceApplicationEntityTitle( "Just For Fun" );
        ImageWriter writer = new ImageWriter();
        writer.SetFileName( file2 );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( out );
        ret = writer.Write();
        if( !ret )
        {
            throw new Exception("Could not write: " + file2 );
        }
    }
}

```

## 12.106 DecompressPixmap.java

```

/*=====

```

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```

=====*/
/*
 * This example will take in a DICOM file, and tries to decompress it (actually write it
 * as ImplicitVRLittleEndian Transfer Syntax).
 *
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/DecompressPixmap.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java DecompressPixmap gdcmData/012345.002.050.dcm out.dcm
 */
import gdcm.*;
public class DecompressPixmap
{
    public static void main(String[] args) throws Exception
    {
        String file1 = args[0];
        String file2 = args[1];
        PixmapReader reader = new PixmapReader();
        reader.SetFileName( file1 );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read: " + file1 );
        }
        ImageChangeTransferSyntax change = new ImageChangeTransferSyntax();
        change.SetTransferSyntax( new TransferSyntax(TransferSyntax.TSType.ImplicitVRLittleEndian) );
        PixmapToPixmapFilter filter = (PixmapToPixmapFilter)change;
        filter.SetInput( reader.GetPixmap() );
        if( !change.Change() )
        {
            throw new Exception("Could not change: " + file1 );
        }
        // The following does not work in Java/swig 2.0.7
        // Pixmap p = ((PixmapToPixmapFilter)change).GetOutput();
        Pixmap p = change.GetOutputAsPixmap(); // be explicit
        // System.out.println( p.toString() );
        // Set the Source Application Entity Title
        FileMetaInformation.SetSourceApplicationEntityTitle( "Just For Fun" );
        PixmapWriter writer = new PixmapWriter();
        writer.SetFileName( file2 );
        writer.SetFile( reader.GetFile() );
        writer.SetImage( p );
        ret = writer.Write();
        if( !ret )
        {
            throw new Exception("Could not write: " + file2 );
        }
    }
}

```

## 12.107 ExtractImageRegion.java

```

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PURPOSE. See the above copyright notice for more information.

=====*/

```

```

/*
 * This small code shows how to use the gdcm.ImageRegionReader API
 * In this example we are taking each frame by frame and dump them to
 * /tmp/frame.raw.
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java ExtractImageRegion input.dcm
 */
import gdcm.*;
import java.io.FileOutputStream;
public class ExtractImageRegion
{
    public static void main(String[] args) throws Exception
    {
        String filename = args[0];
        // instantiate the reader:
        ImageRegionReader reader = new ImageRegionReader();
        reader.SetFileName( filename );
        // pull DICOM info:
        if (!reader.ReadInformation()) return;
        // Get file infos
        File f = reader.GetFile();
        // get some info about image
        UIntArrayType dims = ImageHelper.GetDimensionsValue(f);
        PixelFormat pf = ImageHelper.GetPixelFormatValue (f);
        int pixelsize = pf.GetPixelSize();
        // buffer to get the pixels
        long buffer_length = dims.get(0) * dims.get(1) * pixelsize;
        byte[] buffer = new byte[ (int)buffer_length ];
        // define a simple box region.
        BoxRegion box = new BoxRegion();
        for (int z = 0; z < dims.get(2); z++)
        {
            // Define that I want the image 0, full size (dimx x dimy pixels)
            // and do that for each z:
            box.SetDomain(0, dims.get(0) - 1, 0, dims.get(1) - 1, z, z);
            //System.Console.WriteLine( box.toString() );
            reader.SetRegion( box );
            // reader will try to load the uncompressed image region into buffer.
            // the call returns an error when buffer.Length is too small. For instance
            // one can call:
            // long buf_len = reader.ComputeBufferLength(); // take into account pixel size
            // to get the exact size of minimum buffer
            if (reader.ReadIntoBuffer(buffer, buffer_length))
            {
                FileOutputStream fos = new FileOutputStream("/tmp/frame.raw");
                fos.write(buffer);
                fos.close();
            }
            else
            {
                throw new Exception("can't read pixels error");
            }
        }
    }
}

```

## 12.108 FileAnonymize.java

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
import gdcm.*;
public class FileAnonymize
{
    public static class MyWatcher extends SimpleSubjectWatcher
    {

```

```

public MyWatcher(Subject s) { super(s,"Override String"); }
protected void ShowProgress(Subject caller, Event evt)
{
    ProgressEvent pe = ProgressEvent.Cast(evt);
    System.out.println( "This is my progress:  " + pe.GetProgress() );
}
}
public static void main(String[] args) throws Exception
{
    String input = args[0];
    String output = args[1];
    FileAnonymizer fa = new FileAnonymizer();
    fa.SetInputFileName( input );
    fa.SetOutputFileName( output );
    // Empty Operations
    // It will create elements, since those tags are non-registered public elements (2011):
    fa.Empty( new Tag(0x0008,0x1313) );
    fa.Empty( new Tag(0x0008,0x1317) );
    // Remove Operations
    // The following Tag are actually carefully chosen, since they refer to SQ:
    fa.Remove( new Tag(0x0008,0x2112) );
    fa.Remove( new Tag(0x0008,0x9215) );
    // Replace Operations
    // do not call replace operation on SQ attribute !
    fa.Replace( new Tag(0x0018,0x5100), "MYVALUE " );
    fa.Replace( new Tag(0x0008,0x1160), "MYOTHERVAL" );
    if( !fa.Write() )
    {
        System.out.println( "Could not write" );
        return;
    }
    System.out.println( "success" );
}
}

```

## 12.109 HelloSimple.java

```

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PURPOSE.  See the above copyright notice for more information.

=====*/
/*
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/HelloSimple.java -d .
 *
 * Usage:
 * $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java HelloSimple gdcmData/012345.002.050.dcm
 */
import gdcm.*;
public class HelloSimple
{
    public static void main(String[] args) throws Exception
    {
        String filename = args[0];
        Reader reader = new Reader();
        reader.SetFileName( filename );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read:  " + filename );
        }
        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();
        System.out.println( ds.toString() );
        System.out.println("Success reading:  " + filename );
    }
}

```



## 12.110 ReadFiles.java

```

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=====*/
import gdcm.*;
import java.io.File;
public class ReadFiles
{
    static int i = 0;
    public static void process(String path)
    {
        //String path = file.getPath();
        assert PosixEmulation.FileExists(path) : "Problem converting to 8bits";
        System.out.println("Reading:  " + path );
        System.out.println("File:  " + i++);
        Reader r = new Reader();
        try
        {
            r.SetFileName( path );
            TagSetType skip = new TagSetType();
            skip.insert( new Tag(0x7fe0,0x10) );
            boolean b = r.ReadUpToTag( new Tag(0x88,0x200), skip );
            //System.out.println("DS:\n" + r.GetFile().GetDataSet().toString() );
        }
        finally
        {
            r.delete(); // will properly call C++ destructor and close file descriptor
        }
    }
    // Process only files under dir
    public static void visitAllFiles(File dir)
    {
        if (dir.isDirectory())
        {
            String[] children = dir.list();
            for (int i=0; i<children.length; i++)
            {
                visitAllFiles(new File(dir, children[i]));
            }
        }
        else
        {
            process(dir.getPath());
        }
    }
    public static void waiting (int n)
    {
        long t0, t1;
        t0 = System.currentTimeMillis();
        do
        {
            t1 = System.currentTimeMillis();
        }
        while ((t1 - t0) < (n * 1000));
    }
    public static void main(String[] args) throws Exception
    {
        String directory = args[0];
        Directory gdir = new Directory();
        long n = gdir.Load( directory, true );
        System.out.println( gdir.toString() );
        FilenamesType files = gdir.GetFilenames();
        for( long i = 0; i < n; ++i )
        {
            String path = files.get( (int)i );
            process( path );
        }
        System.out.println( "Java API" );
        //waiting( 10 );
    }
}

```

```

    for( int i = 0; i < 2; ++i )
    {
        File dir = new File(directory);
        visitAllFiles(dir);
    }
}

```

## 12.111 ScanDirectory.java

```

/*=====

```

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```

=====*/
import gdcm.*;
import gdcm.Reader;
import gdcm.LookupTable;
import java.io.File;
import java.io.*;
import java.awt.image.*;
import javax.imageio.ImageIO;
public class ScanDirectory
{
    public static class MyWatcher extends SimpleSubjectWatcher
    {
        public MyWatcher(Subject s) { super(s,"Override String"); }
        protected void ShowProgress(Subject caller, Event evt)
        {
            ProgressEvent pe = ProgressEvent.Cast(evt);
            System.out.println( "This is my progress: " + pe.GetProgress() );
        }
    }
    public static byte[] GetAsByte(Bitmap input)
    {
        long len = input.GetBufferLength();
        byte[] buffer = new byte[ (int)len ];
        PhotometricInterpretation pi = input.GetPhotometricInterpretation();
        if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1 )
        {
            ImageChangePhotometricInterpretation icpi = new ImageChangePhotometricInterpretation();
            icpi.SetInput( input );
            icpi.SetPhotometricInterpretation(
                new PhotometricInterpretation(
                    PhotometricInterpretation.PIType.MONOCHROME2 ) );
            if( icpi.Change() )
            {
                Bitmap output = icpi.GetOutput();
                output.GetArray( buffer );
            }
            return buffer;
        }
        else
        {
            input.GetArray( buffer );
            return buffer;
        }
    }
    public static short[] GetAsShort(Bitmap input)
    {
        long len = input.GetBufferLength(); // length in bytes
        short[] buffer = new short[ (int)len / 2 ];
        PhotometricInterpretation pi = input.GetPhotometricInterpretation();
        if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1 )
        {
            ImageChangePhotometricInterpretation icpi = new ImageChangePhotometricInterpretation();
            icpi.SetInput( input );
            icpi.SetPhotometricInterpretation(
                new PhotometricInterpretation(

```

```

        PhotometricInterpretation.PIType.MONOCHROME2 ) );
    if( icpi.Change() )
    {
        Bitmap output = icpi.GetOutput();
        output.GetArray( buffer );
    }
    return buffer;
}
else
{
    input.GetArray( buffer );
    return buffer;
}
}
public static boolean WritePNG(Bitmap input, String outfilename )
{
    int imageType = BufferedImage.TYPE_CUSTOM;
    PixelFormat pf = input.GetPixelFormat();
    PhotometricInterpretation pi = input.GetPhotometricInterpretation();
    // We need to handle both public and private icon
    // It could well be that we are getting an RGB Icon or 16 bits Icon:
    ColorModel colorModel = null;
    if( pf.GetSamplesPerPixel() == 1 )
    {
        if( pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME1
            || pi.GetType() == PhotometricInterpretation.PIType.MONOCHROME2 )
        {
            if( pf.GetScalarType() == PixelFormat.ScalarType.UINT8 )
            {
                imageType = BufferedImage.TYPE_BYTE_GRAY;
            }
            else if( pf.GetScalarType() == PixelFormat.ScalarType.UINT12 )
            {
                imageType = BufferedImage.TYPE_USHORT_GRAY;
            }
            else if( pf.GetScalarType() == PixelFormat.ScalarType.UINT16 )
            {
                imageType = BufferedImage.TYPE_USHORT_GRAY;
            }
        }
        else if( pi.GetType() == PhotometricInterpretation.PIType.PALETTE_COLOR )
        {
            LookupTable lut = input.GetLUT();
            long rl = lut.GetLUTLength( LookupTable.LookupTableType.RED );
            byte[] rbuf = new byte[ (int)rl ];
            long rl2 = lut.GetLUT( LookupTable.LookupTableType.RED, rbuf );
            assert rl == rl2;
            long gl = lut.GetLUTLength( LookupTable.LookupTableType.GREEN );
            byte[] gbuf = new byte[ (int)gl ];
            long gl2 = lut.GetLUT( LookupTable.LookupTableType.GREEN, gbuf );
            assert gl == gl2;
            long bl = lut.GetLUTLength( LookupTable.LookupTableType.BLUE );
            byte[] bbuf = new byte[ (int)bl ];
            long bl2 = lut.GetLUT( LookupTable.LookupTableType.BLUE, bbuf );
            assert bl == bl2;
            colorModel = new IndexColorModel(8, (int)rl, rbuf, gbuf, bbuf);
            // For code below
            imageType = BufferedImage.TYPE_BYTE_GRAY;
        }
    }
    else if( pf.GetSamplesPerPixel() == 3 )
    {
        if( pf.GetScalarType() == PixelFormat.ScalarType.UINT8 )
        {
            // FIXME should be TYPE_3BYTE_RGB
            imageType = BufferedImage.TYPE_3BYTE_BGR;
        }
    }
}
//System.out.println( "pf: " + pf.toString() );
//System.out.println( "pi: " + pi.toString() );
long width = input.GetDimension(0);
long height = input.GetDimension(0);
BufferedImage bi;
if( pi.GetType() == PhotometricInterpretation.PIType.PALETTE_COLOR )
{
    bi = new BufferedImage(colorModel,
        colorModel.createCompatibleWritableRaster((int)width, (int)height),
        false, null);
}
else
{

```

```

        bi = new BufferedImage((int)width, (int)height, imageType);
    }
    WritableRaster wr = bi.getRaster();
    //System.out.println( "imagetype: " + imageType );
    if( imageType == BufferedImage.TYPE_BYTE_GRAY
        || imageType == BufferedImage.TYPE_3BYTE_BGR )
    {
        byte[] buffer = GetAsByte( input );
        wr.setDataElements (0, 0, (int)width, (int)height, buffer);
    }
    else if( imageType == BufferedImage.TYPE_USHORT_GRAY )
    {
        short[] buffer = GetAsShort( input );
        wr.setDataElements (0, 0, (int)width, (int)height, buffer);
    }
    File outputfile = new File( outfilename );
    try {
        ImageIO.write(bi, "png", outputfile);
    } catch (IOException e) {
        return false;
    }
    return true;
}
public static void main(String[] args) throws Exception
{
    String directory = args[0];
    Directory d = new Directory();
    long nfiles = d.Load( directory, true );
    if(nfiles == 0)
    {
        throw new Exception("No files found");
    }
    // System.out.println( "Files:\n" + d.toString() );
    FilenamesType fns = d.GetFilenames();
    //Scanner s = new Scanner();
    SmartPtrScan sscan = Scanner.New();
    Scanner s = sscan.__ref__();
    //SimpleSubjectWatcher watcher = new SimpleSubjectWatcher(s, "MySimple");
    MyWatcher watcher = new MyWatcher(s);
    Tag[] tagarray = {
        new Tag(0x0010, 0x0010),    // PatientName
        new Tag(0x0010, 0x0020),    // PatientID
        new Tag(0x0010, 0x0030),    // PatientBirthDate
        new Tag(0x0010, 0x0040),    // PatientSex
        new Tag(0x0010, 0x1010),    // PatientAge
        new Tag(0x0020, 0x000d),    // StudyInstanceUID
        new Tag(0x0020, 0x0010),    // StudyID
        new Tag(0x0008, 0x0020),    // StudyDate
        new Tag(0x0008, 0x1030),    // StudyDescription
        new Tag(0x0020, 0x000e),    // SeriesInstanceUID
        new Tag(0x0020, 0x0011),    // SeriesNumber
        new Tag(0x0008, 0x0021),    // SeriesDate
        new Tag(0x0008, 0x103e),    // SeriesDescription
        new Tag(0x0008, 0x0090),    // ReferringPhysicianName
        new Tag(0x0008, 0x0060),    // Modality
        new Tag(0x0054, 0x0400),    // ImageID ?? Should be Instance number ??
        new Tag(0x0008, 0x0018),    // SOPInstanceUID
        new Tag(0x0008, 0x0032),    // AcquisitionTime
        new Tag(0x0008, 0x0033),    // ContentTime
        new Tag(0x0020, 0x0013),    // InstanceNumber
        new Tag(0x0020, 0x1041),    // SliceLocation
        new Tag(0x0018, 0x0050),    // SliceThickness ?? Eg. Enhanced MR Image Storage
        new Tag(0x0008, 0x0080),    // InstitutionName
        new Tag(0x0028, 0x1050),    // WindowCenter
        new Tag(0x0028, 0x1051),    // WindowWidth
    };
    for( Tag t : tagarray ) {
        //System.out.println( "Tag: " + t.toString() );
        s.AddTag( t );
    }
    boolean b = s.Scan( fns );
    if(!b)
    {
        throw new Exception("Could not scan");
    }
    String fn0 = fns.get(0);
    TagToValue mappings = s.GetMapping( fn0 );
    System.out.println( "mappings size: " + mappings.size() );
    for( Tag tag : tagarray ) {
        if( mappings.has_key( tag ) ) {
            String val = mappings.get( tag );

```

```

        System.out.println( "tag/val:  " + tag + "->" + val );
    }
}
for( long idx = 0; idx < fns.size(); ++idx )
{
    Reader r = new Reader();
    String fn = fns.get( (int)idx );
    String outfn = fn + ".png";
    r.SetFileName( fn );
    TagSetType tst = new TagSetType();
    tst.insert( new Tag(0x7fe0,0x10) );
    b = r.ReadUpToTag( new Tag(0x88,0x200), tst );
    UIntArrayType dims = ImageHelper.GetDimensionsValue( r.GetFile() );
    if( b )
    {
        IconImageFilter iif = new IconImageFilter();
        System.out.println( "Processing:  " + fn );
        iif.SetFile( r.GetFile() );
        b = iif.Extract();
        if( b )
        {
            Bitmap icon = iif.GetIconImage(0);
            WritePNG(icon, outfn);
        }
    }
    else
    {
        ImageReader ir = new ImageReader();
        ir.SetFileName( fn );
        if( ir.Read() )
        {
            Image img = ir.GetImage();
            StringFilter sf = new StringFilter();
            sf.SetFile( r.GetFile() );
            String strval = sf.ToString( new Tag(0x0028,0x0120) );
            IconImageGenerator iig = new IconImageGenerator();
            iig.SetPixmap( img );
            iig.AutoPixelMinMax( true );
            try {
                double val = Double.parseDouble( strval );
                iig.SetOutsideValuePixel( val );
            }
            catch ( NumberFormatException e) {
            }
            iig.ConvertRGBToPaletteColor( false );
            long idims[] = { 128, 128};
            iig.SetOutputDimensions( idims );
            iig.Generate();
            Bitmap icon = iig.GetIconImage();
            WritePNG(icon, outfn);
        }
    }
}
}
System.out.println( "Scan:\n" + s.toString() );
System.out.println( "success" );
}
}

```

## 12.112 SimplePrint.java

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
/*
 * Compilation:
 * $ CLASSPATH=gdcm.jar javac ../../gdcm/Examples/Java/SimplePrint.java -d .
 *

```

```

* Usage:
* $ LD_LIBRARY_PATH=. CLASSPATH=gdcm.jar:. java SimplePrint gdcmData/012345.002.050.dcm
*/
import gdcm.*;
public class SimplePrint
{
    public static void RecurseDataSet(File f, DataSet ds, String indent)
    {
        JavaDataSet cds = new JavaDataSet(ds);
        while(!cds.IsAtEnd())
        {
            DataElement de = cds.GetCurrent();
            // Compute VR from the toplevel file, and the currently processed dataset:
            VR vr = DataSetHelper.ComputeVR(f, ds, de.GetTag() );
            if( vr.Compatible( new VR(VR.VRType.SQ) ) )
            {
                long uvl = de.GetVL().GetValueLength(); // Test cast is ok
                System.out.println( indent + de.GetTag().toString() + ":" + uvl ); // why not ?
                //SequenceOfItems sq = de.GetSequenceOfItems();
                // GetValueAsSQ handle more cases than GetSequenceOfItems
                SmartPtrSQ sq = de.GetValueAsSQ();
                long n = sq.GetNumberOfItems();
                for( long i = 1; i <= n; i++) // item starts at 1, not 0
                {
                    Item item = sq.GetItem( i );
                    DataSet nested = item.GetNestedDataSet();
                    RecurseDataSet( f, nested, indent + " " );
                }
            }
            else
            {
                System.out.println( indent + de.toString() );
            }
            cds.Next();
        }
    }
    public static void main(String[] args) throws Exception
    {
        String filename = args[0];
        Reader reader = new Reader();
        reader.SetFileName( filename );
        boolean ret = reader.Read();
        if( !ret )
        {
            throw new Exception("Could not read: " + filename );
        }
        File f = reader.GetFile();
        DataSet ds = f.GetDataSet();
        RecurseDataSet( f, ds, "" );
    }
}

```

## 12.113 AddPrivateAttribute.py

```

1
14
15 """
16 Usage:
17
18 python AddPrivateAttribute.py input.dcm output.dcm
19
20
21 """
22
23 import sys
24 import gdcm
25
26 if __name__ == "__main__":
27
28     file1 = sys.argv[1]
29     file2 = sys.argv[2]
30
31     r = gdcm.Reader()
32     r.SetFileName( file1 )
33     if not r.Read():
34         sys.exit(1)
35

```

```

36 f = r.GetFile()
37 ds = f.GetDataSet()
38
39 # Create a dataelement
40 de = gdcm.DataElement(gdcm.Tag(0x0051, 0x1011))
41 de.SetByteStringValue("p2")
42 de.SetVR(gdcm.VR(gdcm.VR.SH))
43
44 ds.Insert(de)
45
46 w = gdcm.Writer()
47 w.SetFile( f )
48 w.SetFileName( file2 )
49 if not w.Write():
50     sys.exit(1)

```

## 12.114 ConvertMPL.py

```

1
14
15 """
16 display a DICOM image with matplotlib via numpy
17
18 Caveats:
19 - Does not support UINT12/INT12
20
21 Usage:
22
23 python ConvertNumpy.py "IM000000"
24
25 Thanks:
26 plotting example - Ray Schumacher 2009
27 """
28
29 import gdcm
30 import numpy
31 from pylab import *
32
33
34 def get_gdcm_to_numpy_typemap():
35     """Returns the GDCM Pixel Format to numpy array type mapping."""
36     _gdcm_np = {gdcm.PixelFormat.UINT8 :numpy.int8,
37                 gdcm.PixelFormat.INT8 :numpy.uint8,
38                 gdcm.PixelFormat.UINT16 :numpy.uint16,
39                 gdcm.PixelFormat.INT16 :numpy.int16,
40                 gdcm.PixelFormat.UINT32 :numpy.uint32,
41                 gdcm.PixelFormat.INT32 :numpy.int32,
42                 gdcm.PixelFormat.FLOAT32 :numpy.float32,
43                 gdcm.PixelFormat.FLOAT64 :numpy.float64 }
44     return _gdcm_np
45
46 def get_numpy_array_type(gdcm_pixel_format):
47     """Returns a numpy array typecode given a GDCM Pixel Format."""
48     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
49
50 def gdcm_to_numpy(image):
51     """Converts a GDCM image to a numpy array.
52     """
53     pf = image.GetPixelFormat().GetScalarType()
54     print 'pf', pf
55     print image.GetPixelFormat().GetScalarTypeAsString()
56     assert pf in get_gdcm_to_numpy_typemap().keys(), \
57         "Unsupported array type %s"%pf
58     d = image.GetDimension(0), image.GetDimension(1)
59     print 'Image Size: %d x %d' % (d[0], d[1])
60     dtype = get_numpy_array_type(pf)
61     gdcm_array = image.GetBuffer()
62
63     result = numpy.frombuffer(gdcm_array, dtype=dtype).astype(float)
64
65     result.shape = d
66     return result
67
68
69 if __name__ == "__main__":
70     import sys
71     r = gdcm.ImageReader()
72     filename = sys.argv[1]

```

```

75 r.SetFileName( filename )
76 if not r.Read(): sys.exit(1)
77 numpy_array = gdcm_to_numpy( r.GetImage() )
78
79 subplot(111)# one plot, on left
80 title(filename)
81
82 imshow(numpy_array, interpolation='bilinear', cmap=cm.jet)
83
84 subplots_adjust(bottom=0.1, right=0.8, top=0.9)
85 cax = axes([0.85, 0.1, 0.075, 0.8])
86 colorbar(cax=cax)
87 title('values')
88 get_current_fig_manager().window.title('plot')
89 show()

```

## 12.115 ConvertNumpy.py

```

1
14
15 """
16 This module add support for converting a gdcm.Image to a numpy array.
17
18 Caveats:
19 - Does not support UINT12/INT12
20
21 Removed:
22 - float16 is defined in GDCM API but no implementation exist for it ...
23 """
24
25 import gdcm
26 import numpy
27
28 def get_gdcm_to_numpy_typemap():
29     """Returns the GDCM Pixel Format to numpy array type mapping."""
30     _gdcm_np = {gdcm.PixelFormat.UINT8 :numpy.uint8,
31                 gdcm.PixelFormat.INT8 :numpy.int8,
32                 #gdcm.PixelFormat.UINT12 :numpy.uint12,
33                 #gdcm.PixelFormat.INT12 :numpy.int12,
34                 gdcm.PixelFormat.UINT16 :numpy.uint16,
35                 gdcm.PixelFormat.INT16 :numpy.int16,
36                 gdcm.PixelFormat.UINT32 :numpy.uint32,
37                 gdcm.PixelFormat.INT32 :numpy.int32,
38                 #gdcm.PixelFormat.FLOAT16:numpy.float16,
39                 gdcm.PixelFormat.FLOAT32:numpy.float32,
40                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
41     return _gdcm_np
42
43 def get_numpy_array_type(gdcm_pixel_format):
44     """Returns a numpy array typecode given a GDCM Pixel Format."""
45     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
46
47 def gdcm_to_numpy(image):
48     """Converts a GDCM image to a numpy array.
49     """
50     pf = image.GetPixelFormat()
51
52     assert pf.GetScalarType() in get_gdcm_to_numpy_typemap().keys(), \
53         "Unsupported array type %s"%pf
54
55     shape = image.GetDimension(0) * image.GetDimension(1), pf.GetSamplesPerPixel()
56     if image.GetNumberOfDimensions() == 3:
57         shape = shape[0] * image.GetDimension(2), shape[1]
58
59     dtype = get_numpy_array_type(pf.GetScalarType())
60     gdcm_array = image.GetBuffer()
61     result = numpy.frombuffer(gdcm_array, dtype=dtype)
62     result.shape = shape
63     return result
64
65 if __name__ == "__main__":
66     import sys
67     r = gdcm.ImageReader()
68     filename = sys.argv[1]
69     r.SetFileName( filename )
70     if not r.Read():
71         sys.exit(1)

```



```

72
73 numpy_array = gdcm_to_numpy( r.GetImage() )
74 print numpy_array

```

## 12.116 ConvertPIL.py

```

1
14
15 """
16 save a DICOM image with PIL via numpy
17
18 Caveats:
19 - Does not support UINT12/INT12
20
21 Usage:
22
23 python ConvertNumpy.py "IM000000"
24
25 Thanks:
26 plotting example - Ray Schumacher 2009
27 """
28
29 import gdcm
30 import numpy
31 from PIL import Image, ImageOps
32
33
34 def get_gdcm_to_numpy_typemap():
35     """Returns the GDCM Pixel Format to numpy array type mapping."""
36     _gdcm_np = {gdcm.PixelFormat.UINT8 :numpy.int8,
37                 gdcm.PixelFormat.INT8  :numpy.uint8,
38                 gdcm.PixelFormat.UINT16:numpy.uint16,
39                 gdcm.PixelFormat.INT16 :numpy.int16,
40                 gdcm.PixelFormat.UINT32:numpy.uint32,
41                 gdcm.PixelFormat.INT32 :numpy.int32,
42                 gdcm.PixelFormat.FLOAT32:numpy.float32,
43                 gdcm.PixelFormat.FLOAT64:numpy.float64 }
44     return _gdcm_np
45
46 def get_numpy_array_type(gdcm_pixel_format):
47     """Returns a numpy array typecode given a GDCM Pixel Format."""
48     return get_gdcm_to_numpy_typemap()[gdcm_pixel_format]
49
50 def gdcm_to_numpy(image):
51     """Converts a GDCM image to a numpy array.
52     """
53     pf = image.GetPixelFormat().GetScalarType()
54     print 'pf', pf
55     print image.GetPixelFormat().GetScalarTypeAsString()
56     assert pf in get_gdcm_to_numpy_typemap().keys(), \
57         "Unsupported array type %s"%pf
58     d = image.GetDimension(0), image.GetDimension(1)
59     print 'Image Size: %d x %d' % (d[0], d[1])
60     dtype = get_numpy_array_type(pf)
61     gdcm_array = image.GetBuffer()
62     result = numpy.frombuffer(gdcm_array, dtype=dtype)
63     maxV = float(result[result.argmax()])
64
65     result = numpy.log(result+50)
66     maxV = float(result[result.argmax()])
67     result = result*(2.**8/maxV)
68     result.shape = d
69     return result
70
71
72
73 if __name__ == "__main__":
74     import sys
75     r = gdcm.ImageReader()
76     filename = sys.argv[1]
77     r.SetFileName( filename )
78     if not r.Read(): sys.exit(1)
79     numpy_array = gdcm_to_numpy( r.GetImage() )
80
81     pilImage = Image.frombuffer('L',
82                                numpy_array.shape,
83                                numpy_array.astype(numpy.uint8),
84                                'raw','L',0,1)
85
86

```

```

87 pilImage = ImageOps.autocontrast(pilImage, cutoff=.1)
88 pilImage.save(sys.argv[1]+' .jpg')

```

## 12.117 CreateRAWStorage.py

```

1
14
15 """
16 <uid value="1.2.840.10008.5.1.4.1.1.66" name="Raw Data Storage" type="SOP Class" part="PS 3.4"
    retired="false"/>
17 """
18
19 import gdcm
20 import sys,os
21
22 if __name__ == "__main__":
23 r = gdcm.Reader()
24 # Will require Testing...
25 dataroot = gdcm.Testing.GetDataRoot()
26 filename = os.path.join( dataroot, '012345.002.050.dcm' )
27 r.SetFileName( filename )
28 r.Read()
29 f = r.GetFile()
30 ds = f.GetDataSet()
31
32 uid = "1.2.840.10008.5.1.4.1.1.66"
33 # f = gdcm.File()
34 # ds = f.GetDataSet()
35 de = gdcm.DataElement( gdcm.Tag(0x0008,0x0016) )
36 de.SetByteStringValue( uid )
37 vr = gdcm.VR( gdcm.VR.UI )
38 de.SetVR( vr )
39 ds.Replace( de )
40
41 ano = gdcm.Anonymizer()
42 ano.SetFile( r.GetFile() )
43 ano.RemovePrivateTags()
44 ano.RemoveGroupLength()
45 taglist = [
46 gdcm.Tag(0x0008,0x0008),
47 gdcm.Tag(0x0008,0x0022),
48 gdcm.Tag(0x0008,0x0032),
49 gdcm.Tag(0x0008,0x2111),
50 gdcm.Tag(0x0008,0x1150),
51 gdcm.Tag(0x0008,0x1155),
52 gdcm.Tag(0x0008,0x0100),
53 gdcm.Tag(0x0008,0x0102),
54 gdcm.Tag(0x0008,0x0104),
55 gdcm.Tag(0x0040,0xa170),
56 gdcm.Tag(0x0008,0x2112),
57 gdcm.Tag(0x0008,0x0100),
58 gdcm.Tag(0x0008,0x0102),
59 gdcm.Tag(0x0008,0x0104),
60 gdcm.Tag(0x0008,0x9215),
61 gdcm.Tag(0x0018,0x0010),
62 gdcm.Tag(0x0018,0x0022),
63 gdcm.Tag(0x0018,0x0050),
64 gdcm.Tag(0x0018,0x0060),
65 gdcm.Tag(0x0018,0x0088),
66 gdcm.Tag(0x0018,0x0090),
67 gdcm.Tag(0x0018,0x1040),
68 gdcm.Tag(0x0018,0x1100),
69 gdcm.Tag(0x0018,0x1110),
70 gdcm.Tag(0x0018,0x1111),
71 gdcm.Tag(0x0018,0x1120),
72 gdcm.Tag(0x0018,0x1130),
73 gdcm.Tag(0x0018,0x1150),
74 gdcm.Tag(0x0018,0x1151),
75 gdcm.Tag(0x0018,0x1152),
76 gdcm.Tag(0x0018,0x1160),
77 gdcm.Tag(0x0018,0x1190),
78 gdcm.Tag(0x0018,0x1210),
79 gdcm.Tag(0x0020,0x0012),
80 gdcm.Tag(0x0020,0x0032),
81 gdcm.Tag(0x0020,0x0037),
82 gdcm.Tag(0x0020,0x1041),
83 gdcm.Tag(0x0020,0x4000),

```

```

84     gdcM.Tag(0x0028,0x0002),
85     gdcM.Tag(0x0028,0x0004),
86     gdcM.Tag(0x0028,0x0010),
87     gdcM.Tag(0x0028,0x0011),
88     gdcM.Tag(0x0028,0x0030),
89     gdcM.Tag(0x0028,0x0100),
90     gdcM.Tag(0x0028,0x0101),
91     gdcM.Tag(0x0028,0x0102),
92     gdcM.Tag(0x0028,0x0103),
93     gdcM.Tag(0x0028,0x1052),
94     gdcM.Tag(0x0028,0x1053),
95     gdcM.Tag(0x0028,0x2110),
96     gdcM.Tag(0x0028,0x2112),
97     gdcM.Tag(0x7fe0,0x0010),
98     gdcM.Tag(0x0018,0x0020),
99     gdcM.Tag(0x0018,0x0021),
100    gdcM.Tag(0x0018,0x0023),
101    gdcM.Tag(0x0018,0x0025),
102    gdcM.Tag(0x0018,0x0080),
103    gdcM.Tag(0x0018,0x0081),
104    gdcM.Tag(0x0018,0x0083),
105    gdcM.Tag(0x0018,0x0084),
106    gdcM.Tag(0x0018,0x0085),
107    gdcM.Tag(0x0018,0x0086),
108    gdcM.Tag(0x0018,0x0087),
109    gdcM.Tag(0x0018,0x0091),
110    gdcM.Tag(0x0018,0x0093),
111    gdcM.Tag(0x0018,0x0094),
112    gdcM.Tag(0x0018,0x0095),
113    gdcM.Tag(0x0018,0x1088),
114    gdcM.Tag(0x0018,0x1090),
115    gdcM.Tag(0x0018,0x1094),
116    gdcM.Tag(0x0018,0x1250),
117    gdcM.Tag(0x0018,0x1251),
118    gdcM.Tag(0x0018,0x1310),
119    gdcM.Tag(0x0018,0x1312),
120    gdcM.Tag(0x0018,0x1314),
121    gdcM.Tag(0x0018,0x1315),
122    gdcM.Tag(0x0018,0x1316),
123    gdcM.Tag(0x0020,0x0110),
124    gdcM.Tag(0x0028,0x0120),
125    gdcM.Tag(0x0028,0x1050),
126    gdcM.Tag(0x0028,0x1051)
127 ]
128 for tag in taglist:
129     #print tag
130     ano.Remove( tag )
131
132 # special handling
133 gen = gdcM.UIDGenerator()
134 ano.Replace( gdcM.Tag(0x0008,0x9123), gen.Generate() )
135 #ano.Empty( gdcM.Tag(0x0040,0x0555) )
136
137
138 #
139 # uid = gen.Generate()
140 # de.SetTag( gdcM.Tag(0x0008,0x0018) )
141 # de.SetByteStringValue( uid )
142 # ds.Insert( de )
143
144 # init FMI now:
145 #fmi = f.GetHeader()
146 #ts = gdcM.TransferSyntax()
147 #print ts
148 #fmi.SetDataSetTransferSyntax( ts ) # default
149 #print fmi.GetDataSetTransferSyntax()
150 #de.SetTag( gdcM.Tag(0x0002,0x0010) )
151 #uid = "1.2.840.10008.1.2"
152 #de.SetByteStringValue( uid )
153 #fmi.Insert( de )
154 # f.SetHeader( r.GetFile().GetHeader() )
155
156 writer = gdcM.Writer()
157 writer.SetFile( ano.GetFile() )
158 writer.SetFileName( "rawstorage.dcm" );
159 writer.Write()

```

## 12.118 DecompressImage.py

```

1
14
15 """
16 Usage:
17
18 python DecompressImage.py gdcmlData/012345.002.050.dcm decompress.dcm
19 """
20
21 import gdcml
22 import sys
23
24 if __name__ == "__main__":
25
26     file1 = sys.argv[1]
27     file2 = sys.argv[2]
28
29     r = gdcml.ImageReader()
30     r.SetFileName( file1 )
31     if not r.Read():
32         sys.exit(1)
33
34     # check GetFragment API:
35     pd = r.GetFile().GetDataSet().GetDataElement(gdcml.Tag(0x7fe0, 0x0010))
36     frags = pd.GetSequenceOfFragments();
37     frags.GetFragment(0);
38
39     ir = r.GetImage()
40     w = gdcml.ImageWriter()
41     image = w.GetImage()
42
43     image.SetNumberOfDimensions( ir.GetNumberOfDimensions() );
44     dims = ir.GetDimensions();
45     print ir.GetDimension(0);
46     print ir.GetDimension(1);
47     print "Dims:", dims
48
49     # Just for fun:
50     dircos = ir.GetDirectionCosines()
51     t = gdcml.Orientation.GetType(tuple(dircos))
52     l = gdcml.Orientation.GetLabel(t)
53     print "Orientation label:", l
54
55     image.SetDimension(0, ir.GetDimension(0) );
56     image.SetDimension(1, ir.GetDimension(1) );
57
58     pixeltype = ir.GetPixelFormat();
59     image.SetPixelFormat( pixeltype );
60
61     pi = ir.GetPhotometricInterpretation();
62     image.SetPhotometricInterpretation( pi );
63
64     pixeldata = gdcml.DataElement( gdcml.Tag(0x7fe0, 0x0010) )
65     str1 = ir.GetBuffer()
66     #print ir.GetBufferLength()
67     pixeldata.SetByteStringValue( str1 )
68     image.SetDataElement( pixeldata )
69
70     w.SetFileName( file2 )
71     w.SetFile( r.GetFile() )
72     w.SetImage( image )
73     if not w.Write():
74         sys.exit(1)

```

## 12.119 DumbAnonymizer.py

```

1
14
15 """
16 This example shows how one can use the gdcml.Anonymizer in 'dumb' mode.
17 This class becomes really handy when one knows which particular tag to fill in.
18
19 Usage:
20
21 python DumbAnonymizer.py gdcmlData/012345.002.050.dcm out.dcm
22

```

```

23 """
24
25 import gdcm
26
27 # http://www.oid-info.com/get/1.3.6.1.4.17434
28 THERALYS_ORG_ROOT = "1.3.6.1.4.17434"
29
30 tag_rules={
31     # Value
32     (0x0012,0x0010):("Value","MySponsorName"),
33     (0x0012,0x0020):("Value","MyProtocolID"),
34     (0x0012,0x0021):("Value","MyProtocolName"),
35     (0x0012,0x0062):("Value","YES"),
36     (0x0012,0x0063):("Value","MyDeidentificationMethod"),
37
38     # Method
39     # (0x0002,0x0003):("Method","GenerateMSOPId"),
40     # (0x0008,0x1155):("Method","GenerateMSOPId"),
41     (0x0008,0x0018):("Method","GenerateMSOPId"),
42     (0x0010,0x0010):("Method","GetSponsorInitials"),
43     (0x0010,0x0020):("Method","GetSponsorId"),
44     (0x0012,0x0030):("Method","GetSiteId"),
45     (0x0012,0x0031):("Method","GetSiteName"),
46     (0x0012,0x0040):("Method","GetSponsorId"),
47     (0x0012,0x0050):("Method","GetTPId"),
48     (0x0018,0x0022):("Method","KeepIfExist"),
49     (0x0018,0x1315):("Method","KeepIfExist"),
50     (0x0020,0x000d):("Method","GenerateStudyId"),
51     (0x0020,0x000e):("Method","GenerateSeriesId"),
52     (0x0020,0x1002):("Method","GetNumberOfFrames"),
53     (0x0020,0x0020):("Method","GetPatientOrientation"),
54     # Other:
55     (0x0012,0x0051):("Patient Field","Type Examen"),
56     (0x0018,0x1250):("Sequence Field","Receive Coil"),
57     (0x0018,0x0088):("Sequence Field","Spacing Between Slice"),
58     (0x0018,0x0095):("Sequence Field","Pixel Bandwidth"),
59     (0x0018,0x0082):("Sequence Field","Inversion Time"),
60 }
61
62 class MyAnon:
63     def __init__(self):
64         self.studyuid = None
65         self.seriesuid = None
66         generator = gdcm.UIDGenerator()
67         if not self.studyuid:
68             self.studyuid = generator.Generate()
69         if not self.seriesuid:
70             self.seriesuid = generator.Generate()
71     def GetSponsorInitials(self):
72         return "dummy^foobar"
73     def GenerateStudyId(self):
74         return self.studyuid
75     def GenerateSeriesId(self):
76         return self.seriesuid
77     #def GenerateMSOPId(self):
78     def GenerateMSOPId(self):
79         generator = gdcm.UIDGenerator()
80         return generator.Generate()
81     def GetSiteId(self):
82         return "MySiteId"
83     def GetSiteName(self):
84         return "MySiteName"
85     def GetSponsorId(self):
86         return "MySponsorId"
87     def GetTPId(self):
88         return "MyTP"
89
90 if __name__ == "__main__":
91     import sys
92     gdcm.FileMetaInformation.SetSourceApplicationEntityTitle( "DumbAnonymizer" )
93     gdcm.UIDGenerator.SetRoot( THERALYS_ORG_ROOT )
94
95     r = gdcm.Reader()
96     filename = sys.argv[1]
97     r.SetFileName( filename )
98     if not r.Read(): sys.exit(1)
99
100     obj = MyAnon()
101
102     w = gdcm.Writer()
103     ano = gdcm.Anonymizer()

```

```

104 ano.SetFile( r.GetFile() )
105 ano.RemoveGroupLength()
106 for tag,rule in tag_rules.items():
107     if rule[0] == 'Value':
108         print tag,rule
109         ano.Replace( gdc.Tag( tag[0], tag[1] ), rule[1] )
110     elif rule[0] == 'Method':
111         print tag,rule
112         # result = locals()[rule[1]]()
113         methodname = rule[1]
114         if hasattr(obj, methodname):
115             _member = getattr(obj, methodname)
116             result = _member()
117             ano.Replace( gdc.Tag( tag[0], tag[1] ), result )
118         else:
119             print "Problem with: ", methodname
120
121 outfilename = sys.argv[2]
122 w.SetFileName( outfilename )
123 w.SetFile( ano.GetFile() )
124 if not w.Write(): sys.exit(1)

```

## 12.120 ExtractImageRegion.py

```

1
14
15 """
16
17 This small code shows how to use the gdc.ImageRegionReader API
18 In this example we are taking each frame by frame and dump them to
19 /tmp/frame.raw.
20
21 Usage:
22 $ ExtractImageRegion.py input.dcm
23
24 Example:
25 $ ExtractImageRegion.py gdcData/012345.002.050.dcm
26 $ md5sum /tmp/frame.raw
27 d594a5e2fde12f32b6633ca859b4d4a6 /tmp/frame.raw
28 $ gdcminfo --md5sum gdcData/012345.002.050.dcm
29 [...]
30 md5sum: d594a5e2fde12f32b6633ca859b4d4a6
31 """
32
33 import gdc
34
35 if __name__ == "__main__":
36     import sys
37     filename = sys.argv[1]
38
39     file_size = gdc.System.FileSize(filename);
40
41     # instantiate the reader:
42     reader = gdc.ImageRegionReader();
43     reader.SetFileName( filename );
44
45     # pull DICOM info:
46     if not reader.ReadInformation():
47         sys.exit(1)
48
49     # store current offset:
50     cur_pos = reader.GetStreamCurrentPosition();
51
52     remaining = file_size - cur_pos;
53
54     print("Remaining bytes to read (Pixel Data): %d" % remaining );
55
56     # Get file infos
57     f = reader.GetFile();
58
59     # get some info about image
60     dims = gdc.ImageHelper.GetDimensionsValue(f);
61     print(dims)
62     pf = gdc.ImageHelper.GetPixelFormatValue(f);
63     pixelsize = pf.GetPixelSize();
64     pi = gdc.ImageHelper.GetPhotometricInterpretationValue(f);
65     print( pi );

```

```

66
67 # buffer to get the pixels
68 buffer = bytearray( dims[0] * dims[1] * pixelsize )
69
70 # define a simple box region.
71 box = gdcm.BoxRegion();
72 for z in range(0, dims[2]):
73     # Define that I want the image 0, full size (dimx x dimy pixels)
74     # and do that for each z:
75     box.SetDomain(0, dims[0] - 1, 0, dims[1] - 1, z, z);
76     #print( box.toString() );
77     reader.SetRegion( box );
78
79 # reader will try to load the uncompressed image region into buffer.
80 # the call returns an error when buffer.Length is too small. For instance
81 # one can call:
82 # uint buf_len = reader.ComputeBufferLength(); // take into account pixel size
83 # to get the exact size of minimum buffer
84 if reader.ReadIntoBuffer(buffer):
85     open('/tmp/frame.raw', 'wb').write(buffer)
86 else:
87     #throw new Exception("can't read pixels error");
88     sys.exit(1)

```

## 12.121 FindAllPatientName.py

```

1
14 """
15 This example shows how one can use the gdcm.CompositeNetworkFunctions class
16 for executing a C-FIND query
17 It will print the list of patient name found
18
19 Usage:
20
21 python FindAllPatientName.py
22
23 """
24
25 import gdcm
26
27 # Patient Name
28 tag = gdcm.Tag(0x10,0x10)
29 de = gdcm.DataElement(tag)
30
31 # Search all patient name where string match 'F*'
32 de.SetByteStringValue('F*')
33
34 ds = gdcm.DataSet()
35 ds.Insert(de)
36
37 cnf = gdcm.CompositeNetworkFunctions()
38 theQuery = cnf.ConstructQuery (gdcm.ePatientRootType,gdcm.ePatient,ds)
39
40 #print theQuery.ValidateQuery()
41
42 # prepare the variable for output
43 ret = gdcm.DataSetArrayType()
44
45 # Execute the C-FIND query
46 cnf.CFind('dicom.example.com',11112,theQuery,ret,'GDCM_PYTHON','ANY-SCP')
47
48 for i in range(0,ret.size()):
49     print "Patient #",i
50     print ret[i]

```

## 12.122 FixCommaBug.py

```

1
14
15 """
16 Using LC_NUMERIC set to something not compatible with "C" it is possible to write out "," instead of
17 "." as required by the DICOM standard
18 Issue is still current (IMHO) with gdcm 2.0.9

```

```

19 """
20
21 import gdc
22 import sys
23
24 filename = sys.argv[1]
25 outname = sys.argv[2]
26
27 # read
28 r = gdc.Reader()
29 r.SetFileName( filename )
30 if not r.Read():
31     print "not valid"
32     sys.exit(1)
33
34 file = r.GetFile()
35 dataset = file.GetDataSet()
36
37 ano = gdc.Anonymizer()
38 ano.SetFile( file )
39
40 tags = [
41     gdc.Tag(0x0018,0x1164),
42     gdc.Tag(0x0018,0x0088),
43     gdc.Tag(0x0018,0x0050),
44     gdc.Tag(0x0028,0x0030),
45 ]
46
47 for tag in tags:
48     print tag
49     if dataset.FindDataElement( tag ):
50         pixelpacing = dataset.GetDataElement( tag )
51         #print pixelpacing
52         bv = pixelpacing.GetByteValue()
53         str = bv.GetBuffer()
54         #print bv.GetLength()
55         #print len(str)
56         new_str = str.replace(",",".")
57         # Need to explicitly pass bv.GetLength() to remove any trailing garbage
58         ano.Replace( tag, new_str, bv.GetLength() )
59
60 #print dataset
61
62 w = gdc.Writer()
63 w.SetFile( file )
64 w.SetFileName( outname )
65 if not w.Write():
66     print "Cannot write"
67     sys.exit(1)
68
69 # paranoid:
70 image_reader = gdc.ImageReader()
71 image_reader.SetFileName( outname )
72 if not image_reader.Read():
73     print "there is still a comma"
74     sys.exit(1)
75
76 print "Success!"
77 sys.exit(0) # success

```

## 12.123 GetPortionCSAHeader.py

```

1
2
3
4
5
6 Usage:
7
8 python GetPortionCSAHeader.py input.dcm
9
10 Footnote:
11 SIEMENS is not publishing any information on the CSA header. So any info extracted
12 is at your own risk.
13 """
14
15
16 import sys
17 import gdc
18
19

```



```

28 if __name__ == "__main__":
29
30 file = sys.argv[1]
31
32 r = gdcm.Reader()
33 r.SetFileName( file )
34 if not r.Read():
35     sys.exit(1)
36
37 ds = r.GetFile().GetDataSet()
38 csa_t1 = gdcm.CSAHeader()
39 csa_t2 = gdcm.CSAHeader()
40 #print csa
41 t1 = csa_t1.GetCSAImageHeaderInfoTag();
42 print t1
43 t2 = csa_t2.GetCSASeriesHeaderInfoTag();
44 print t2
45 # Let's do it for t1:
46 if ds.FindDataElement( t1 ):
47     csa_t1.LoadFromDataElement( ds.GetDataElement( t1 ) )
48     print csa_t1
49
50 # Now let's pretend we are only interested in B_value and DiffusionGradientDirection entries:
51 bvalues = csa_t1.GetCSAElementByName( "B_value" ) # WARNING: it is case sensitive !
52 print bvalues
53
54 diffgraddir = csa_t1.GetCSAElementByName( "DiffusionGradientDirection" ) # WARNING: it is case sensitive !
55 print diffgraddir
56
57 # repeat for t2 if you like it:
58 if ds.FindDataElement( t2 ):
59     csa_t2.LoadFromDataElement( ds.GetDataElement( t2 ) )
60     # print csa_t2
61
62 gdt = csa_t2.GetCSAElementByName( "GradientDelayTime" )
63 print gdt
64
65 bv = gdt.GetByteValue();
66 #print bv
67 str = bv.GetPointer()
68 print str.split("\\")

```

## 12.124 HelloWorld.py

```

1
14
15 """
16 Hello World !
17 """
18
19 import gdcm
20 import sys
21
22 if __name__ == "__main__":
23
24     # verbosity:
25     #gdcm.Trace.DebugOn()
26     #gdcm.Trace.WarningOn()
27     #gdcm.Trace.ErrorOn()
28
29     # Get the filename from the command line
30     filename = sys.argv[1]
31
32     # Instanciate a gdcm.Reader
33     # This is the main class to handle any type of DICOM object
34     # You should check for gdcm.ImageReader for reading specifically DICOM Image file
35     r = gdcm.Reader()
36     r.SetFileName( filename )
37     # If the reader fails to read the file, we should stop !
38     if not r.Read():
39         print "Not a valid DICOM file"
40         sys.exit(1)
41
42     # Get the DICOM File structure
43     file = r.GetFile()
44
45     # Get the DataSet part of the file

```

```

46 dataset = file.GetDataSet()
47
48 # Ok let's print it !
49 print dataset
50
51 # Use StringFilter to print a particular Tag:
52 sf = gdcm.StringFilter()
53 sf.SetFile(r.GetFile())
54
55 # Check if Attribute exist
56 print dataset.FindElement( gdcm.Tag(0x0028,0x0010))
57
58 # Let's print it as string pair:
59 print sf.ToStringPair(gdcm.Tag(0x0028,0x0010))

```

## 12.125 ManipulateFile.py

```

1
14
15 """
16 Usage:
17
18 python ManipulateFile.py input.dcm output.dcm
19
20 Footnote:
21 GDCM 1.2.x would create incorrect Multiframe MR Image Storage file. Try to recover from
22 the issues to recreate a MultiframeGrayscaleByteSecondaryCaptureImageStorage file.
23 e.g:
24
25 python ManipulateFile.py Insight/Testing/Temporary/itkGDCMImageIOTest5-j2k.dcm manipulated.dcm
26 """
27
28 import sys
29 import gdcm
30
31 if __name__ == "__main__":
32
33 file1 = sys.argv[1]
34 file2 = sys.argv[2]
35
36 r = gdcm.Reader()
37 r.SetFileName( file1 )
38 if not r.Read():
39     sys.exit(1)
40
41 ano = gdcm.Anonymizer()
42 ano.SetFile( r.GetFile() )
43 ano.RemovePrivateTags()
44 ano.Remove( gdcm.Tag(0x0032,0x1030) )
45 ano.Remove( gdcm.Tag(0x008,0x14) )
46 ano.Remove( gdcm.Tag(0x008,0x1111) )
47 ano.Remove( gdcm.Tag(0x008,0x1120) )
48 ano.Remove( gdcm.Tag(0x008,0x1140) )
49 ano.Remove( gdcm.Tag(0x10,0x21b0) )
50 ano.Empty( gdcm.Tag(0x10,0x10) )
51 ano.Empty( gdcm.Tag(0x10,0x20) )
52 ano.Empty( gdcm.Tag(0x10,0x30) )
53 ano.Empty( gdcm.Tag(0x20,0x10) )
54 ano.Empty( gdcm.Tag(0x32,0x1032) )
55 ano.Empty( gdcm.Tag(0x32,0x1033) )
56 ano.Empty( gdcm.Tag(0x40,0x241) )
57 ano.Empty( gdcm.Tag(0x40,0x254) )
58 ano.Empty( gdcm.Tag(0x40,0x253) )
59 ano.Empty( gdcm.Tag(0x40,0x1001) )
60 ano.Empty( gdcm.Tag(0x8,0x80) )
61 ano.Empty( gdcm.Tag(0x8,0x50) )
62 ano.Empty( gdcm.Tag(0x8,0x1030) )
63 ano.Empty( gdcm.Tag(0x8,0x103e) )
64 ano.Empty( gdcm.Tag(0x18,0x1030) )
65 ano.Empty( gdcm.Tag(0x38,0x300) )
66 g = gdcm.UIDGenerator()
67 ano.Replace( gdcm.Tag(0x0008,0x0018), g.Generate() )
68 ano.Replace( gdcm.Tag(0x0020,0x00d), g.Generate() )
69 ano.Replace( gdcm.Tag(0x0020,0x00e), g.Generate() )
70 ano.Replace( gdcm.Tag(0x0020,0x052), g.Generate() )
71 #ano.Replace( gdcm.Tag(0x0008,0x0016), "1.2.840.10008.5.1.4.1.1.7.2" )
72 """

```

```

73 ano.Remove( gdcm.Tag(0x0018,0x0020) ) # ScanningSequence
74 ano.Remove( gdcm.Tag(0x0018,0x0021) ) # SequenceVariant
75 ano.Remove( gdcm.Tag(0x0018,0x0022) ) # ScanOptions
76 ano.Remove( gdcm.Tag(0x0018,0x0023) ) # MRAcquisitionType
77 ano.Remove( gdcm.Tag(0x0018,0x0050) ) # SliceThickness
78 ano.Remove( gdcm.Tag(0x0018,0x0080) ) # RepetitionTime
79 ano.Remove( gdcm.Tag(0x0018,0x0081) ) # EchoTime
80 ano.Remove( gdcm.Tag(0x0018,0x0088) ) # SpacingBetweenSlices
81 ano.Remove( gdcm.Tag(0x0018,0x0091) ) # EchoTrainLength
82 ano.Remove( gdcm.Tag(0x0018,0x1164) ) # ImagerPixelSpacing
83
84 ano.Remove( gdcm.Tag(0x0020,0x0032) ) # Image Position (Patient)
85 ano.Remove( gdcm.Tag(0x0020,0x0037) ) # Image Orientation (Patient)
86 ano.Remove( gdcm.Tag(0x0020,0x0052) ) # Frame of Reference UID
87 ano.Remove( gdcm.Tag(0x0020,0x1040) ) # Position Reference Indicator
88
89 ano.Replace( gdcm.Tag(0x0028,0x0301), "NO" ) # Burned In Annotation
90
91 ano.Empty( gdcm.Tag(0x0020,0x0020) )
92
93 ano.Remove( gdcm.Tag(0x7fe0,0x0000) )
94
95 #ano.Empty( gdcm.Tag(0x0028,0x0009) ) # Frame Increment Pointer
96
97 #ano.Empty( gdcm.Tag(0x0028,0x1052) ) #<entry group="0028" element="1052" vr="DS" vm="1" name="Rescale
Intercept"/>
98 #ano.Empty( gdcm.Tag(0x0028,0x1053) ) #<entry group="0028" element="1053" vr="DS" vm="1" name="Rescale
Slope"/>
99 #ano.Replace( gdcm.Tag(0x0028,0x1054), "US" ) #<entry group="0028" element="1054" vr="LO" vm="1"
name="Rescale Type"/>
100
101 ano.Replace( gdcm.Tag(0x2050, 0x0020), "IDENTITY")
102 """
103
104 w = gdcm.Writer()
105 w.SetFile( ano.GetFile() )
106 w.SetFileName( file2 )
107 if not w.Write():
108     sys.exit(1)

```

## 12.126 ManipulateSequence.py

```

1
14
15 """
16 Usage:
17
18 python ManipulateSequence.py input.dcm output.dcm
19
20 This was tested using:
21
22 python ManipulateSequence.py gdcmData/D_CLUNIE_CT1_J2KI.dcm myoutput.dcm
23
24 This is a dummy example on how to modify a value set in a nested-nested dataset
25
26 WARNING:
27 Do not use as-is in production, this is just an example
28 This example works in an undefined length Item only (you need to explicitly recompute the length otherwise)
29 """
30
31 import sys
32 import gdcm
33
34 if __name__ == "__main__":
35
36     file1 = sys.argv[1]
37     file2 = sys.argv[2]
38
39     r = gdcm.Reader()
40     r.SetFileName( file1 )
41     if not r.Read():
42         sys.exit(1)
43
44     f = r.GetFile()
45     ds = f.GetDataSet()
46     tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
47     if ds.FindElement( tsis ):

```

```

48     sis = ds.GetDataElement( tsis )
49     #sqsis = sis.GetSequenceOfItems()
50     # GetValueAsSQ handle more cases
51     sqsis = sis.GetValueAsSQ()
52     if sqsis.GetNumberOfItems():
53         item1 = sqsis.GetItem(1)
54         nestedds = item1.GetNestedDataSet()
55         tprcs = gdcm.Tag(0x0040,0xa170) # PurposeOfReferenceCodeSequence
56         if nestedds.FindDataElement( tprcs ):
57             prcs = nestedds.GetDataElement( tprcs )
58             sqprcs = prcs.GetSequenceOfItems()
59             if sqprcs.GetNumberOfItems():
60                 item2 = sqprcs.GetItem(1)
61                 nestedds2 = item2.GetNestedDataSet()
62                 # (0008,0104) LO [Uncompressed predecessor] # 24, 1 CodeMeaning
63                 tcm = gdcm.Tag(0x0008,0x0104)
64                 if nestedds2.FindDataElement( tcm ):
65                     cm = nestedds2.GetDataElement( tcm )
66                     mystr = "GDCM was here"
67                     cm.SetByteStringValue( mystr )
68
69     w = gdcm.Writer()
70     w.SetFile( f )
71     w.SetFileName( file2 )
72     if not w.Write():
73         sys.exit(1)

```

## 12.127 MergeFile.py

```

1
14
15 """
16 Usage:
17
18 python MergeFile.py input1.dcm input2.dcm
19
20 It will produce a 'merge.dcm' output file, which contains all meta information from input1.dcm
21 and copy the Stored Pixel values from input2.dcm
22 This script even works when input2.dcm is a Secondary Capture and does not contains information
23 such as IOP and IPP...
24 """
25
26 import sys
27 import gdcm
28
29 if __name__ == "__main__":
30
31     file1 = sys.argv[1]
32     file2 = sys.argv[2]
33
34     r1 = gdcm.ImageReader()
35     r1.SetFileName( file1 )
36     if not r1.Read():
37         sys.exit(1)
38
39     r2 = gdcm.ImageReader()
40     r2.SetFileName( file2 )
41     if not r2.Read():
42         sys.exit(1)
43
44     # Image from r2 could be Secondary Capture and thus would not contains neither IPP nor IOP
45     # Instead always prefer to only copy the Raw Data Element.
46     # Warning ! Image need to be identical ! Only the value of Stored Pixel can be different.
47     r1.GetImage().SetDataElement( r2.GetImage().GetDataElement() )
48
49     w = gdcm.ImageWriter()
50     w.SetFile( r1.GetFile() )
51     #w.SetImage( r2.GetImage() ) # See comment above
52     w.SetImage( r1.GetImage() )
53
54     w.SetFileName( "merge.dcm" )
55     if not w.Write():
56         sys.exit(1)
57
58     sys.exit(0)

```

## 12.128 NewSequence.py

```

1
14
15 """
16 Usage:
17
18 python NewSequence.py input.dcm output.dcm
19
20
21 Thanks to Robert Irie for code
22 """
23
24 import sys
25 import gdcm
26
27 if __name__ == "__main__":
28
29     file1 = sys.argv[1]
30     file2 = sys.argv[2]
31
32     r = gdcm.Reader()
33     r.SetFileName( file1 )
34     if not r.Read():
35         sys.exit(1)
36
37     f = r.GetFile()
38     ds = f.GetDataSet()
39     #tsis = gdcm.Tag(0x0008,0x2112) # SourceImageSequence
40
41     # Create a dataelement
42     de = gdcm.DataElement(gdcm.Tag(0x0010, 0x2180))
43     de.SetByteStringValue("Occupation")
44     de.SetVR(gdcm.VR(gdcm.VR.SH))
45
46     # Create an item
47     it=gdcm.Item()
48     it.SetVLToUndefined() # Needed to not popup error message
49     #it.InsertDataElement(de)
50     nds=it.GetNestedDataSet()
51     nds.Insert(de)
52
53     # Create a Sequence
54     sq=gdcm.SequenceOfItems().New()
55     sq.SetLengthToUndefined()
56     sq.AddItem(it)
57
58     # Insert sequence into data set
59     des=gdcm.DataElement(gdcm.Tag(0x0400,0x0550))
60     des.SetVR(gdcm.VR(gdcm.VR.SQ))
61     des.SetValue(sq.__ref__())
62     des.SetVLToUndefined()
63
64     ds.Insert(des)
65
66     w = gdcm.Writer()
67     w.SetFile( f )
68     w.SetFileName( file2 )
69     if not w.Write():
70         sys.exit(1)

```

## 12.129 PhilipsPrivateRescaleInterceptSlope.py

```

1
14
15 """
16 Usage:
17
18 python
19 """
20
21 import gdcm
22 import sys
23
24 filename = sys.argv[1]
25 tmpfile = "/tmp/philips_rescaled.dcm"
26

```

```

27
28 # Need to access some private tags, read the file :
29 reader = gdcM.Reader()
30 reader.SetFileName( filename )
31 if not reader.Read():
32     sys.exit(1)
33
34 ds = reader.GetFile().GetDataSet()
35
36 #print ds
37 # (2005,1409)      DS      4      0.0
38 # (2005,140a)     DS      16     1.52283272283272
39
40 # (2005,0014)      LO      26     Philips MR Imaging DD 005
41 tag1 = gdcM.PrivateTag(0x2005,0x09,"Philips MR Imaging DD 005")
42 tag2 = gdcM.PrivateTag(0x2005,0x0a,"Philips MR Imaging DD 005")
43 print tag1
44 print tag2
45
46 # make sure to do a copy, we want the private tag to remain
47 # otherwise gdcM gives us a reference
48 el1 = gdcM.DataElement( ds.GetDataElement( tag1 ) )
49 print el1
50 el2 = gdcM.DataElement( ds.GetDataElement( tag2 ) )
51 print el2
52
53 # (0028,1052) DS [-1000]          # 6, 1 RescaleIntercept
54 # (0028,1053) DS [1]             # 2, 1 RescaleSlope
55
56 el1.SetTag( gdcM.Tag(0x0028,0x1052) )
57 el2.SetTag( gdcM.Tag(0x0028,0x1053) )
58
59 ds.Insert( el1 )
60 ds.Insert( el2 )
61
62 w = gdcM.Writer()
63 w.SetCheckFileMetaInformation( False )
64 w.SetFileName( tmpfile )
65 w.SetFile( reader.GetFile() )
66 if not w.Write():
67     sys.exit(1)
68
69 print "success"

```

## 12.130 PlaySound.py

```

1
14
15 """
16 Usage:
17
18 python PlaySound.py input.dcm
19 """
20
21 import gdcM
22 import sys
23
24 #filename = "/home/mmalaterre/Creatis/gdcMDataExtra/gdcMNonImageData/audio_from_rafael_sanguinetti.dcm"
25 filename = sys.argv[1]
26 print filename
27
28 r = gdcM.Reader()
29 r.SetFileName( filename )
30 if not r.Read():
31     sys.exit(1)
32
33 ds = r.GetFile().GetDataSet()
34
35 waveformtag = gdcM.Tag(0x5400,0x0100)
36 waveformsq = ds.GetDataElement( waveformtag )
37 #print waveformsq
38
39 #print dir(waveformsq)
40
41 items = waveformsq.GetSequenceOfItems()
42
43 if not items.GetNumberOfItems():

```

```

44     sys.exit(1)
45
46 item = items.GetItem(1)
47 #print item
48
49 waveformds = item.GetNestedDataSet()
50 #print waveformds
51
52 waveformdatatag = gdcm.Tag(0x5400,0x1010)
53 waveformdata = waveformds.GetDataElement( waveformdatatag )
54
55 #print waveformdata.GetPointer()
56 bv = waveformdata.GetByteValue()
57 print dir(bv)
58
59 #print bv.GetPointer()
60 print bv.GetLength()
61 l = 116838
62
63 file='test.wav'
64 myfile = open(file, "wb")
65 s = bv.GetPointer()
66 for i in range(0, l):
67     myfile.write(s[i])
68 myfile.close()
69
70 # http://mail.python.org/pipermail/python-list/2004-October/288905.html
71 if sys.platform.startswith('win'):
72     from winsound import PlaySound, SND_FILENAME, SND_ASYNC
73     PlaySound(file, SND_FILENAME|SND_ASYNC)
74 elif sys.platform.find('linux')>-1:
75     from wave import open as waveOpen
76     from ossaudiodev import open as ossOpen
77     s = waveOpen(file,'rb')
78     (nc,sw,fr,nf,comptype, compname) = s.getparams( )
79     dsp = ossOpen('/dev/dsp','w')
80     try:
81         from ossaudiodev import AFMT_S16_NE
82     except ImportError:
83         if byteorder == "little":
84             AFMT_S16_NE = ossaudiodev.AFMT_S16_LE
85         else:
86             AFMT_S16_NE = ossaudiodev.AFMT_S16_BE
87     dsp.setparameters(AFMT_S16_NE, nc, fr)
88     data = s.readframes(nf)
89     s.close()
90     dsp.write(data)
91     dsp.close()

```

## 12.131 PrivateDict.py

```

1
14
15 """
16 """
17
18 import gdcm
19 import sys,os
20
21 if __name__ == "__main__":
22     #gdcm.Trace.DebugOn()
23     globInst = gdcm.Global.GetInstance()
24     # Try to load Part3.xml file
25     # This file is too big for being accessible directly at runtime.
26     globInst.LoadResourcesFiles()
27
28
29 # Get a private tag from the runtime dicts. LoadResourcesFiles could
30 # have failed but this has no impact on the private dict
31
32 d = globInst.GetDicts()
33 print d.GetDictEntry( gdcm.Tag(0x0029,0x0010) ,"SIEMENS CSA HEADER" )
34 pd = d.GetPrivateDict()
35 print pd.GetDictEntry( gdcm.PrivateTag(0x0029,0x0010,"SIEMENS CSA HEADER") )

```

## 12.132 ReWriteSCAsMR.py

```

1
14
15 """
16 GDCM 1.x would write out MR Image Storage as Secondary Capture Object while still setting Rescale
17   Slope/Intercept
18   and saving the Pixel Spacing in (0028,0030)
19   """
20 import gdcmm
21 import sys,os
22
23 def CheckSecondaryCaptureObjectIsMRImageStorage(r):
24     ds = r.GetFile().GetDataSet()
25     # Check Source Image Sequence
26     if ds.FindDataElement( gdcmm.Tag(0x0008,0x2112) ):
27         sis = ds.GetDataElement( gdcmm.Tag(0x0008,0x2112) )
28         sqsis = sis.GetSequenceOfItems()
29         if sqsis.GetNumberOfItems():
30             item1 = sqsis.GetItem(1)
31             nestedds = item1.GetNestedDataSet()
32             if nestedds.FindDataElement( gdcmm.Tag(0x0008,0x1150) ):
33                 ReferencedSOPClassUID = nestedds.GetDataElement( gdcmm.Tag(0x0008,0x1150) )
34                 raw = ReferencedSOPClassUID.GetByteValue().GetPointer()
35                 uids = gdcmm.UIDs()
36                 # what is the actual object we are looking at ?
37                 ms = gdcmm.MediaStorage()
38                 ms.SetFromDataSet(ds)
39                 msuid = ms.GetString()
40                 uids.SetFromUID( msuid )
41                 msuidname = uids.GetName() # real Media Storage Name
42                 uids.SetFromUID( raw )
43                 sqmsuidname = uids.GetName() # Source Image Sequence Media Storage Name
44                 # If object is SC and Source derivation is MRImageStorage then we can assume 'Pixel Spacing' is
45                 correct
46                 if( sqmsuidname == 'MR Image Storage' and msuidname == 'Secondary Capture Image Storage' ):
47                     return True
48             # in all other case simply return the currentspacing:
49             return False
50 if __name__ == "__main__":
51     r = gdcmm.ImageReader()
52     filename = sys.argv[1]
53     r.SetFileName( filename )
54     if not r.Read():
55         sys.exit(1)
56     f = r.GetFile()
57
58     if( CheckSecondaryCaptureObjectIsMRImageStorage(r) ):
59         # Special handling of the spacing:
60         # GDCM 1.2.0 would not rewrite correctly DICOM Object and would always set them as 'Secondary Capture
61         Image Storage'
62         # while we would rather have 'MR Image Storage'
63         gdcmm.ImageHelper.SetForcePixelSpacing( True )
64         mrspacing = gdcmm.ImageHelper.GetSpacingValue( r.GetFile() )
65         # TODO: I cannot do simply the following:
66         #image.SetSpacing( mrspacing )
67         image.SetSpacing(0, mrspacing[0] )
68         image.SetSpacing(1, mrspacing[1] )
69         image.SetSpacing(2, mrspacing[2] )
70         gdcmm.ImageHelper.SetForceRescaleInterceptSlope( True )
71         ris = gdcmm.ImageHelper.GetRescaleInterceptSlopeValue( r.GetFile() )
72         image.SetIntercept( ris[0] )
73         image.SetSlope( ris[1] )
74
75     outfilename = sys.argv[2]
76     w = gdcmm.ImageWriter()
77     w.SetFileName( outfilename )
78     w.SetFile( r.GetFile() )
79     w.SetImage( image )
80     if not w.Write():
81         sys.exit(1)
82     sys.exit(0)

```



## 12.133 ReadAndDumpDICOMDIR.py

```

1
23
24
25
26 import sys
27 import gdcm
28
29 if __name__ == "__main__":
30     # Check arguments
31     if (len(sys.argv) < 2):
32         # No filename passed
33         print "No input filename found"
34         quit()
35
36     filename = sys.argv[1]
37
38
39     # Read file
40     reader = gdcm.Reader()
41     reader.SetFileName(filename)
42     if (not reader.Read()):
43         print "Unable to read %s" % (filename)
44         quit()
45
46     file = reader.GetFile()
47
48     # Retrieve header information
49     fileMetaInformation = file.GetHeader()
50     print fileMetaInformation
51
52     # Retrieve data set
53     dataSet = file.GetDataSet()
54     #print dataSet
55
56     # Check media storage
57     mediaStorage = gdcm.MediaStorage()
58     mediaStorage.SetFromFile(file)
59     if (gdcm.MediaStorage.GetMSType(str(mediaStorage)) != gdcm.MediaStorage.MediaStorageDirectoryStorage):
60         # File is not a DICOMDIR
61         print "This file is not a DICOMDIR (Media storage type: %s)" % (str(mediaStorage))
62         quit()
63
64     # Check Media Storage SOP Class
65     if (fileMetaInformation.FindElement(gdcm.Tag(0x0002, 0x0002))):
66         sopClassUid = str(fileMetaInformation.GetDataElement(gdcm.Tag(0x0002, 0x0002)).GetValue())
67         # Check SOP UID
68         if (sopClassUid != "1.2.840.10008.1.3.10"):
69             # File is not a DICOMDIR
70             print "This file is not a DICOMDIR"
71     else:
72         # Not present
73         print "Media Storage SOP Class not present"
74         quit()
75
76     # Iterate through the DICOMDIR data set
77     iterator = dataSet.GetDES().begin()
78     while (not iterator.equal(dataSet.GetDES().end())):
79         dataElement = iterator.next()
80
81         # Check the element tag
82         if (dataElement.GetTag() == gdcm.Tag(0x0004, 0x1220)):
83             # The 'Directory Record Sequence' element
84             sequence = dataElement.GetValueAsSQ()
85
86             # Loop through the sequence items
87             itemNr = 1
88             while (itemNr < sequence.GetNumberOfItems()):
89                 item = sequence.GetItem(itemNr)
90
91                 # Check the element tag
92                 if (item.FindElement(gdcm.Tag(0x0004, 0x1430))):
93                     # The 'Directory Record Type' element
94                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
95
96                     # PATIENT
97                     while (value.strip() == "PATIENT"):
98                         print value.strip()
99                     # Print patient name

```

```

100         if (item.FindDataElement(gdcm.Tag(0x0010, 0x0010))):
101             value = str(item.GetDataElement(gdcm.Tag(0x0010, 0x0010)).GetValue())
102             print value
103
104         # Print patient ID
105         if (item.FindDataElement(gdcm.Tag(0x0010, 0x0020))):
106             value = str(item.GetDataElement(gdcm.Tag(0x0010, 0x0020)).GetValue())
107             print value
108
109         # Next
110         itemNr = itemNr + 1
111         item = sequence.GetItem(itemNr)
112         if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
113             value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
114
115         # STUDY
116         while (value.strip() == "STUDY"):
117             print value.strip()
118
119             # Print study UID
120             if (item.FindDataElement(gdcm.Tag(0x0020, 0x000d))):
121                 value = str(item.GetDataElement(gdcm.Tag(0x0020, 0x000d)).GetValue())
122                 print value
123
124             # Print study date
125             if (item.FindDataElement(gdcm.Tag(0x0008, 0x0020))):
126                 value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x0020)).GetValue())
127                 print value
128
129             # Print study description
130             if (item.FindDataElement(gdcm.Tag(0x0008, 0x1030))):
131                 value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x1030)).GetValue())
132                 print value
133
134             # Next
135             itemNr = itemNr + 1
136             item = sequence.GetItem(itemNr)
137             if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
138                 value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
139
140             # SERIES
141             while (value.strip() == "SERIES"):
142                 print value.strip()
143
144                 # Print series UID
145                 if (item.FindDataElement(gdcm.Tag(0x0020, 0x000e))):
146                     value = str(item.GetDataElement(gdcm.Tag(0x0020, 0x000e)).GetValue())
147                     print value
148
149                 # Print series modality
150                 if (item.FindDataElement(gdcm.Tag(0x0008, 0x0060))):
151                     value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x0060)).GetValue())
152                     print "Modality"
153                     print value
154
155                 # Print series description
156                 if (item.FindDataElement(gdcm.Tag(0x0008, 0x103e))):
157                     value = str(item.GetDataElement(gdcm.Tag(0x0008, 0x103e)).GetValue())
158                     print "Description"
159                     print value
160
161                 # Next
162                 itemNr = itemNr + 1
163                 item = sequence.GetItem(itemNr)
164                 if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
165                     value = str(item.GetDataElement(gdcm.Tag(0x0004, 0x1430)).GetValue())
166
167                 # IMAGE
168                 while (value.strip() == "IMAGE"):
169                     print value.strip()
170
171                     # Print image UID
172                     if (item.FindDataElement(gdcm.Tag(0x0004, 0x1511))):
173                         value = str(item.GetDataElement(gdcm.Tag(0x0004,
174
175                             0x1511)).GetValue())
176
177                         print value
178
179                     # Next
180                     if itemNr < sequence.GetNumberOfItems():
181                         itemNr = itemNr + 1
182                     else:

```

```

180                                     break
181
182                                     item = sequence.GetItem(itemNr)
183                                     if (item.FindDataElement(gdcm.Tag(0x0004, 0x1430))):
184                                         value = str(item.GetDataElement(gdcm.Tag(0x0004,
185                                             0x1430)).GetValue())
186
187                                     # Next
188                                     itemNr = itemNr + 1

```

## 12.134 RemovePrivateTags.py

```

1
14
15 """
16 Usage:
17
18 python RemovePrivateTags.py input.dcm output.dcm
19 """
20
21 import sys
22 import gdcm
23
24
25 if __name__ == "__main__":
26
27     file1 = sys.argv[1]
28     file2 = sys.argv[2]
29
30     # Instanciate the reader.
31     r = gdcm.Reader()
32     r.SetFileName( file1 )
33     if not r.Read():
34         sys.exit(1)
35
36     # Remove private tags
37     ano = gdcm.Anonymizer()
38     ano.SetFile( r.GetFile() )
39     if not ano.RemovePrivateTags():
40         sys.exit(1)
41
42     # Write DICOM file
43     w = gdcm.Writer()
44     w.SetFile( ano.GetFile() )
45     #w.CheckFileMetaInformationOff() # Do not attempt to check meta header
46     w.SetFileName( file2 )
47     if not w.Write():
48         sys.exit(1)
49
50     # It is usually a good idea to exit the script with an error, as gdcm does not remove partial (incorrect)
51     # DICOM file
52     # (application level)

```

## 12.135 ScanDirectory.py

```

1
14
15 import gdcm
16 import sys,os
17
18 class ProgressWatcher(gdcm.SimpleSubjectWatcher):
19     def ShowProgress(self, sender, event):
20         pe = gdcm.ProgressEvent.Cast(event)
21         print pe.GetProgress()
22     def EndFilter(self):
23         print "Yay ! I am done"
24
25 if __name__ == "__main__":
26     directory = sys.argv[1]
27
28     # Define the set of tags we are interested in
29     t1 = gdcm.Tag(0x8,0x8);
30     t2 = gdcm.Tag(0x10,0x10);

```

```

31
32 # Iterate over directory
33 d = gdcm.Directory();
34 nfiles = d.Load( directory );
35 if(nfiles == 0): sys.exit(1);
36 # System.Console.WriteLine( "Files:\n" + d.toString() );
37
38 filenames = d.GetFilenames()
39
40 # Get rid of any Warning while parsing the DICOM files
41 gdcm.Trace.WarningOff()
42
43 # instanciate Scanner:
44 sp = gdcm.Scanner.New();
45 s = sp.__ref__()
46 w = ProgressWatcher(s, 'Watcher')
47
48 s.AddTag( t1 );
49 s.AddTag( t2 );
50 b = s.Scan( filenames );
51 if(not b): sys.exit(1);
52
53 print "success" ;
54 #print s
55
56 pttv = gdcm.PythonTagToValue( s.GetMapping( filenames[1] ) )
57 pttv.Start()
58 # iterate until the end:
59 while( not pttv.IsAtEnd() ):
60     # get current value for tag and associated value:
61     # if tag was not found, then it was simply not added to the internal std::map
62     # Warning value can be None
63     tag = pttv.GetCurrentTag()
64     value = pttv.GetCurrentValue()
65     print tag,"->",value
66     # increment iterator
67     pttv.Next()
68
69 sys.exit(0)

```

## 12.136 SortImage.py

```

1
14
15 """
16 Usage:
17
18 python SortImage.py dirname
19 """
20
21 import gdcm
22 import sys
23
24 def PrintProgress(object, event):
25     assert event == "ProgressEvent"
26     print "Progress:", object.GetProgress()
27
28 def MySort(ds1, ds2):
29     # compare ds1
30     return False
31
32 if __name__ == "__main__":
33
34     dirname = sys.argv[1]
35     d = gdcm.Directory()
36     d.Load( dirname )
37
38     print d
39
40     sorter = gdcm.Sorter()
41     sorter.SetSortFunction( MySort )
42     #sorter.AddObserver( "ProgressEvent", PrintProgress )
43     sorter.Sort( d.GetFilenames() )
44
45     print "Sorter:"
46     print sorter

```

## 12.137 WriteBuffer.py

```

1
14
15 """
16 Usage:
17
18 http://chuckhahm.com/Ischem/Zurich/XX_0134
19
20 (2005,1132) SQ (Sequence with undefined length #=8)      # u/1, 1 Unknown Tag & Data
21 (fffe,e000) na (Item with undefined length #=9)          # u/1, 1 Item
22 (2005,0011) LO [Philips MR Imaging DD 002]               # 26, 1 PrivateCreator
23 (2005,1137) PN [PDF_CONTROL_GEN_PARS]                   # 20, 1 Unknown Tag & Data
24 (2005,1138) PN (no value available)                     # 0, 0 Unknown Tag & Data
25 (2005,1139) PN [IEEE_PDF]                               # 8, 1 Unknown Tag & Data
26 (2005,1140) PN (no value available)                     # 0, 0 Unknown Tag & Data
27 (2005,1141) PN (no value available)                     # 0, 0 Unknown Tag & Data
28 (2005,1143) SL 3103                                     # 4, 1 Unknown Tag & Data
29 (2005,1144) OW 0566\0000\013b\0000\0a4a\0000\000e\0000\0a7a\0000\0195\0000\0008... # 3104, 1 Unknown Tag
    & Data
30 (2005,1147) CS [Y]                                       # 2, 1 Unknown Tag & Data
31 (fffe,e00d) na (ItemDelimitationItem)                  # 0, 0 ItemDelimitationItem
32 (fffe,e000) na (Item with undefined length #=9)          # u/1, 1 Item
33 (2005,0011) LO [Philips MR Imaging DD 002]               # 26, 1 PrivateCreator
34 (2005,1137) PN [PDF_CONTROL_PREP_PARS]                  # 22, 1 Unknown Tag & Data
35 (2005,1138) PN (no value available)                     # 0, 0 Unknown Tag & Data
36 (2005,1139) PN [IEEE_PDF]                               # 8, 1 Unknown Tag & Data
37 (2005,1140) PN (no value available)                     # 0, 0 Unknown Tag & Data
38 (2005,1141) PN (no value available)                     # 0, 0 Unknown Tag & Data
39 (2005,1143) SL 7934                                     # 4, 1 Unknown Tag & Data
40 (2005,1144) OW 19b6\0000\005f\0000\1b2a\0000\00f3\0000\1eee\0000\0000\0000\0008... # 7934, 1 Unknown Tag
    & Data
41 (2005,1147) CS [Y]                                       # 2, 1 Unknown Tag & Data
42 (fffe,e00d) na (ItemDelimitationItem)                  # 0, 0 ItemDelimitationItem
43 ...
44 """
45
46 import sys
47 import gdcm
48
49 if __name__ == "__main__":
50
51 file1 = sys.argv[1]
52 file2 = sys.argv[2]
53
54 r = gdcm.Reader()
55 r.SetFileName( file1 )
56 if not r.Read():
57     sys.exit(1)
58
59 fg = gdcm.FilenameGenerator()
60 f = r.GetFile()
61 ds = f.GetDataSet()
62 tsis = gdcm.Tag(0x2005,0x1132) #
63 if ds.FindDataElement( tsis ):
64     sis = ds.GetDataElement( tsis )
65     #sqsis = sis.GetSequenceOfItems()
66     # GetValueAsSQ handle more cases
67     sqsis = sis.GetValueAsSQ()
68     if sqsis.GetNumberOfItems():
69         nitems = sqsis.GetNumberOfItems();
70         fg.SetNumberOfFileNames( nitems )
71         fg.SetPrefix( file2 )
72         if not fg.Generate():
73             print "problem"
74             sys.exit(1)
75         for i in range(0,nitems):
76             item1 = sqsis.GetItem(i+1) # Item start at 1
77             nestedds = item1.GetNestedDataSet()
78             tprcs = gdcm.Tag(0x2005,0x1144) #
79             if nestedds.FindDataElement( tprcs ):
80                 prcs = nestedds.GetDataElement( tprcs )
81                 bv = prcs.GetByteValue()
82                 print bv
83                 f = open( fg.GetFilename(i) , "w" )
84                 f.write( bv.WriteBuffer() )

```

## 12.138 HelloActiviz.cs

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
using vtkgdcm;
using Kitware.VTK;
using System;
using System.Runtime.InteropServices;
/*
 * This example shows how vtkgdcm can be connected to Kitware.VTK Activiz product.
 * Three (3) arguments are required:
 * 1. Input DICOM file           (SWIG)
 * 2. Temporary PNG (intermediate) file (Activiz)
 * 3. Final DICOM file           (SWIG)
 *
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz.exe ~/Creatis/gdcmData/test.acr out.png toto.dcm
 *
 * Footnote:
 * this test originally used vtkBMPWriter / vtkBMPReader combination to store intermediate
 * image file, but BMP file are 24bits by default. Instead use PNG format which supports seems
 * to be closer to what was expected in this simple test.
 */
public class HelloActiviz
{
    // Does not work with Activiz.NET-5.4.0.455-Linux-x86_64-Personal
    /*
    static void ConnectSWIGToActiviz(Kitware.VTK.vtkImageExport imgin, Kitware.VTK.vtkImageImport imgout)
    {
        imgout.SetUpdateInformationCallback(imgin.GetUpdateInformationCallback());
        imgout.SetPipelineModifiedCallback(imgin.GetPipelineModifiedCallback());
        imgout.SetWholeExtentCallback(imgin.GetWholeExtentCallback());
        imgout.SetSpacingCallback(imgin.GetSpacingCallback());
        imgout.SetOriginCallback(imgin.GetOriginCallback());
        imgout.SetScalarTypeCallback(imgin.GetScalarTypeCallback());
        imgout.SetNumberOfComponentsCallback(imgin.GetNumberOfComponentsCallback());
        imgout.SetPropagateUpdateExtentCallback(imgin.GetPropagateUpdateExtentCallback());
        imgout.SetUpdateDataCallback(imgin.GetUpdateDataCallback());
        imgout.SetDataExtentCallback(imgin.GetDataExtentCallback());
        imgout.SetBufferPointerCallback(imgin.GetBufferPointerCallback());
        imgout.SetCallbackUserData(imgin.GetCallbackUserData());
    }
    */
    static Kitware.VTK.vtkImageData ConnectSWIGToActiviz(vtkgdcm.vtkImageData imgin)
    {
        HandleRef rawCppThis = imgin.GetCppThis();
        Kitware.VTK.vtkImageData imgout = new Kitware.VTK.vtkImageData( rawCppThis.Handle, false, false);
        return imgout;
    }
    static vtkgdcm.vtkImageData ConnectActivizToSWIG(Kitware.VTK.vtkImageData imgin)
    {
        HandleRef rawCppThis = imgin.GetCppThis();
        vtkgdcm.vtkImageData imgout = new vtkgdcm.vtkImageData( rawCppThis );
        return imgout;
    }
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];
        // Step 1. Test SWIG -> Activiz
        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        reader.SetFileName( filename );
        //reader.Update(); // DO NOT call Update to check pipeline execution
        Kitware.VTK.vtkImageData imgout = ConnectSWIGToActiviz(reader.GetOutput());
        System.Console.WriteLine( imgout.ToString() ); // not initialized as expected
        vtkPNGWriter writer = new vtkPNGWriter();
        writer.SetInput( imgout );
        writer.SetFileName( outfilename );
        writer.Write();
    }
}

```

```
// Step 2. Test Activiz -> SWIG
vtkPNGReader bmpreader = new vtkPNGReader();
bmpreader.SetFileName( outfilename );
//bmpreader.Update(); // DO NOT update to check pipeline execution
System.Console.WriteLine( bmpreader.GetOutput().ToString() ); // not initialized as expected
vtkgdcmtcm.vtkImageData imgout2 = ConnectActivizToSWIG(bmpreader.GetOutput());
System.Console.WriteLine( imgout2.ToString() ); // not initialized as expected
Kitware.VTK.vtkMedicalImageProperties prop = new Kitware.VTK.vtkMedicalImageProperties();
prop.SetModality( "MR" );
string outfilename2 = args[2];
vtkGDCMImageWriter writer2 = vtkGDCMImageWriter.New();
writer2.SetMedicalImageProperties( prop.CastToActiviz() );
writer2.SetFileName( outfilename2 );
writer2.SetInput( imgout2 );
writer2.Write();
return 0;
}
```

## 12.139 HelloActiviz2.cs

```
/*=====
Program: GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * Usage:
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz2.exe gdcmtcm/test.acr bla.png bla2.dcm
 */
/*
 * From the outside view, no-one can detect that object pass to/from
 * vtkGDCMImageWriter/vtkGDCMImageReader are not Activiz object.
 *
 * TODO: Test Command/Observer
 */
public class HelloActiviz2
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        string outfilename = args[1];
        string outfilename2 = args[2];
        vtkGDCMImageReader reader = new Kitware.VTK.GDCM.vtkGDCMImageReader();
        reader.SetFileName( filename );
        // When calling multiple times creation of C# object from the same C++ object it triggers a:
        //error: potential reccounting error: Duplicate rawCppThis - weak reference that is still alive. Attempting
        //to add '0x00b2dc10' again.
        // Allowing new wrapped object to take over table key...
        // Original object should *not* have been destroyed while we still had it in our table without notifying
        // us...
        //reader.GetOutput();
        //reader.GetOutput();
        System.Console.WriteLine( reader.ToString() ); // Test the ToString compat with Activiz
        vtkGDCMImageWriter writer = new vtkGDCMImageWriter();
        writer.SetInput( reader.GetOutput() );
        writer.SetFileName( outfilename2 );
        writer.Write();
        System.Console.WriteLine( reader.GetOutput().ToString() ); // Test the ToString compat with Activiz
        System.Console.WriteLine( writer.ToString() ); // Test the ToString compat with Activiz
        vtkPNGWriter pngwriter = new vtkPNGWriter();
        pngwriter.SetInput( reader.GetOutput() );
        pngwriter.SetFileName( outfilename );
        pngwriter.Write();
        // at that point the .Write() should have triggered an Update() on the reader:
        if( reader.GetImageFormat() == vtkgdcmtcm.VTK_LUMINANCE ) // MONOCHROME2

```

```

    {
        System.Console.WriteLine( "Image is MONOCHROME2" ); //
    }
    vtkPNGReader bmpreader = new vtkPNGReader();
    bmpreader.SetFileName( outfilename );
    vtkMedicalImageProperties prop = new vtkMedicalImageProperties();
    prop.SetModality( "MR" );
    vtkMatrix4x4 dircos = reader.GetDirectionCosines();
    dircos.Invert();
    vtkGDCMImageWriter writer2 = new vtkGDCMImageWriter();
    writer2.SetFileName( outfilename2 );
    writer2.SetDirectionCosines( dircos );
    writer2.SetMedicalImageProperties( prop );
    writer2.SetInput( bmpreader.GetOutput() );
    writer2.Write();
    return 0;
}

```

## 12.140 HelloActiviz3.cs

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz3.exe ~/Creatis/gdcmData/test.acr
 */
public class HelloActiviz3
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        vtkStringArray array = vtkStringArray.New();
        array.InsertNextValue(filename);
        reader.SetFileNames(array);
        reader.Update();
        //System.Console.Write(reader.GetOutput());
        vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();
        vtkImageViewer2 viewer = vtkImageViewer2.New();
        viewer.SetInput(reader.GetOutput());
        viewer.SetupInteractor(iren);
        viewer.SetSize(600, 600);
        viewer.Render();
        iren.Initialize();
        iren.Start();
        return 0;
    }
}

```

## 12.141 HelloActiviz4.cs

```

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```



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```

=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz4.exe ~/Creatis/gdcmData/test.acr
 */
public class HelloActiviz4
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        vtkGDCMImageReader reader = new vtkGDCMImageReader();
        vtkStringArray array = vtkStringArray.New();
        array.InsertNextValue(filename);
        reader.SetFileNames(array);
        reader.Update();
        //System.Console.Write(reader.GetOutput());
        vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();
        vtkImageViewer viewer = vtkImageViewer.New();
        viewer.SetInput(reader.GetOutput());
        viewer.SetupInteractor(iren);
        viewer.SetSize(600, 600);
        viewer.Render();
        iren.Initialize();
        iren.Start();
        return 0;
    }
}

```

## 12.142 HelloActiviz5.cs

```

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=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
// The command line arguments are:
// -I          => run in interactive mode; unless this is used, the program will
//              not allow interaction and exit
// -D <path> => path to the data; the data should be in <path>/Data/
/*
 * $ export MONO_PATH=/usr/lib/cli/ActiViz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/HelloActiviz5.exe -I
 */
public class HelloActiviz5
{
    public static int Main(string[] args)
    {
        vtkTesting testHelper = vtkTesting.New();
        for ( int cc = 0; cc < args.Length; cc++ )
        {
            //testHelper.AddArguments(argc, const_cast<const char **>(argv));
            //System.Console.Write( "args:  " + args[cc] + "\n" );
            testHelper.AddArgument( args[cc] );
        }
        if ( testHelper.IsFlagSpecified("-D") != 0 )
        {
            string VTK_DATA_ROOT = vtkGDCMTesting.GetVTKDataRoot();
            if ( VTK_DATA_ROOT != null )
            {
                //System.Console.Write( "VTK_DATA_ROOT: " + VTK_DATA_ROOT + "\n" );
                testHelper.SetDataRoot(VTK_DATA_ROOT);
            }
        }
    }
}

```

```

        testHelper.AddArgument("-D");
        testHelper.AddArgument(VTK_DATA_ROOT);
    }
}

string dataRoot = testHelper.GetDataRoot();
string filename = dataRoot;
filename += "/Data/mr.001";
vtkDirectory dir = vtkDirectory.New();
if( dir.FileIsDirectory( dataRoot ) == 0 )
{
    filename = vtkGDCMTesting.GetGDCMDataRoot() + "/test.acr";
}

//System.Console.Write( "dataRoot: " + dataRoot + "\n" );
System.Console.Write( "filename being used is: " + filename + "\n" );
vtkGDCMImageReader reader = vtkGDCMImageReader.New();
vtkStringArray array = vtkStringArray.New();
array.InsertNextValue(filename);
reader.SetFileNames(array);
reader.Update();
System.Console.Write(reader.GetOutput());
vtkRenderWindowInteractor iren = vtkRenderWindowInteractor.New();
vtkRenderer ren1 = vtkRenderer.New();
vtkRenderWindow renWin = vtkRenderWindow.New();
renWin.AddRenderer(ren1);
vtkImageActor actor = vtkImageActor.New();
vtkImageMapToWindowLevelColors coronalColors = vtkImageMapToWindowLevelColors.New();
coronalColors.SetInput(reader.GetOutput());
actor.SetInput(coronalColors.GetOutput());
ren1.AddActor(actor);
iren.SetRenderWindow(renWin);
iren.Initialize();
renWin.Render();
int retVal = testHelper.IsInteractiveModeSpecified();
if( retVal != 0 )
{
    iren.Start();
}
return 0;
}
}

```

## 12.143 HelloVTKWorld.cs

```

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=====*/
using vtkgdcm;
/*
 * This test only test the SWIG/VTK part, you do not need Activiz
 */
public class HelloVTKWorld
{
    public static int Main(string[] args)
    {
        string filename = args[0];
        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        reader.SetFileName( filename );
        reader.Update();
        vtkMedicalImageProperties prop = reader.GetMedicalImageProperties();
        System.Console.WriteLine( prop.GetPatientName() ); //
        if( reader.GetImageFormat() == vtkgdcm.vtkgdcm.VTK_LUMINANCE ) // MONOCHROME2
        {
            System.Console.WriteLine( "Image is MONOCHROME2" ); //
        }
        // Just for fun, invert the direction cosines, output should reflect that:
        vtkMatrix4x4 dircos = reader.GetDirectionCosines();
        dircos.Invert();
    }
}

```

```

        string outfilename = args[1];
        vtkGDCMImageWriter writer = vtkGDCMImageWriter.New();
        writer.SetMedicalImageProperties( reader.GetMedicalImageProperties() );
        writer.SetDirectionCosines( dircos );
        writer.SetShift( reader.GetShift() );
        writer.SetScale( reader.GetScale() );
        writer.SetImageFormat( reader.GetImageFormat() );
        writer.SetFileName( outfilename );
        writer.SetInputConnection( reader.GetOutputPort() );
        writer.Write();
        return 0;
    }
}

```

## 12.144 HelloVTKWorld2.cs

```

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PURPOSE. See the above copyright notice for more information.

=====*/
using vtkgdcms;
/*
 * This test only test the SWIG/VTK part, you do not need Activiz
 */
public class HelloVTKWorld2
{
    public static int Main(string[] args)
    {
        string VTK_DATA_ROOT = vtkGDCMTesting.GetVTKDataRoot();
        vtkVolumetricReader reader = vtkVolumetricReader.New();
        reader.SetDataDimensions(64, 64);
        reader.SetDataByteOrderToLittleEndian();
        reader.SetFilePrefix(VTK_DATA_ROOT + "/Data/headsq/quarter");
        reader.SetImageRange(1, 93);
        reader.SetDataSpacing(3.2, 3.2, 1.5);
        vtkImageCast cast = vtkImageCast.New();
        cast.SetInputConnection( reader.GetOutputPort() );
        cast.SetOutputScalarTypeToUnsignedChar();
        // By default this is creating a Multiframe Grayscale Word Secondary Capture Image Storage
        vtkGDCMImageWriter writer = vtkGDCMImageWriter.New();
        writer.SetFileName( "headsq.dcm" );
        writer.SetInputConnection( reader.GetOutputPort() );
        // cast -> Multiframe Grayscale Byte Secondary Capture Image Storage
        // writer.SetInputConnection( cast.GetOutputPort() );
        writer.SetFileDimensionality( 3 );
        writer.Write();
        return 0;
    }
}

```

## 12.145 MetaImageMD5Activiz.cs

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

```

```

=====*/
using Kitware.VTK;
using Kitware.VTK.GDCM;
using gdcm;
/*
 * $ export MONO_PATH=/usr/lib/cli/Activiz.NET:/usr/lib/cli/Kitware.mummy.Runtime-1.0
 * $ mono ./bin/MetaImageMD5Activiz.exe gdcmData/012345.002.050.dcm
 */
public class MetaImageMD5Activiz
{
    public static int ProcessOneMHDMD5(string filename)
    {
        vtkGDCMImageReader reader = vtkGDCMImageReader.New();
        reader.FileLowerLeftOn();
        reader.DebugOff();
        int canread = reader.CanReadFile( filename );
        if( canread == 0 )
        {
            string refms = gdcm.Testing.GetMediaStorageFromFile(filename);
            if( gdcm.MediaStorage.IsImage( gdcm.MediaStorage.GetMSType(refms) ) )
            {
                System.Console.Write( "Problem with file: " + filename + "\n" );
                return 1;
            }
            // not an image
            return 0;
        }
        reader.SetFileName( filename );
        reader.Update();
        // System.Console.Write(reader.GetOutput());
        vtkMetaImageWriter writer = vtkMetaImageWriter.New();
        writer.SetCompression( false );
        writer.SetInput( reader.GetOutput() );
        string subdir = "MetaImageMD5Activiz";
        string tmpdir = gdcm.Testing.GetTempDirectory( subdir );
        if( !gdcm.PosixEmulation.FileIsDirectory( tmpdir ) )
        {
            gdcm.PosixEmulation.MakeDirectory( tmpdir );
        }
        string mhdfile = gdcm.Testing.GetTempFilename( filename, subdir );
        string rawfile = mhdfile;
        mhdfile += ".mhd";
        rawfile += ".raw";
        writer.SetFileName( mhdfile );
        writer.Write();
        string digestmhd = gdcm.Testing.ComputeFileMD5( mhdfile );
        string digestraw = gdcm.Testing.ComputeFileMD5( rawfile );
        string mhdref = vtkGDCMTesting.GetMHDMD5FromFile(filename);
        string rawref = vtkGDCMTesting.GetRAWMD5FromFile(filename);
        if( mhdref != digestmhd )
        {
            System.Console.Write( "Problem with mhd file: " + filename + "\n" );
            System.Console.Write( digestmhd );
            System.Console.Write( "\n" );
            System.Console.Write( mhdref );
            System.Console.Write( "\n" );
            return 1;
        }
        if( rawref != digestraw )
        {
            System.Console.Write( "Problem with raw file: " + filename + "\n" );
            System.Console.Write( digestraw );
            System.Console.Write( "\n" );
            System.Console.Write( rawref );
            System.Console.Write( "\n" );
            return 1;
        }
        return 0;
    }
    public static int Main(string[] args)
    {
        if ( args.Length == 1 )
        {
            string filename = args[0];
            return ProcessOneMHDMD5( filename );
        }
        // Loop over all gdcmData
        gdcm.Trace.DebugOff();
        gdcm.Trace.WarningOff();
        gdcm.Trace.ErrorOff();
        uint n = gdcm.Testing.GetNumberOfFileNames();

```

```

int ret = 0;
for( uint i = 0; i < n; ++i )
{
    string filename = gdcm.Testing.GetFileName( i );
    ret += ProcessOneMHDMD5( filename );
}
return ret;
}

```

## 12.146 RefCounting.cs

```
/*=====
```

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```
=====*/
```

```

using Kitware.VTK;
using Kitware.VTK.GDCM;
/*
 * this is not so much an example but simply a test to make sure ctor / dtor work as expected
 * and call the ::New and ->Delete() of VTK style.
 */
public class RefCounting
{
    public static int Main(string[] args)
    {
        vtkGDCMTesting testing1 = vtkGDCMTesting.New();
        vtkGDCMTesting testing2 = new vtkGDCMTesting(); // just in case people do not read STYLE documentation
        vtkGDCMImageReader reader1 = vtkGDCMImageReader.New();
        vtkGDCMImageReader reader2 = new vtkGDCMImageReader();
        vtkGDCMImageWriter writer1 = vtkGDCMImageWriter.New();
        vtkGDCMImageWriter writer2 = new vtkGDCMImageWriter();
        using (vtkGDCMTesting testing3 = new vtkGDCMTesting())
        {
            System.Console.WriteLine( "GetReferenceCount: " + testing1.GetReferenceCount() + "\n");
            System.Console.WriteLine( "GetReferenceCount: " + testing2.GetReferenceCount() + "\n");
            System.Console.WriteLine( "GetReferenceCount: " + testing3.GetReferenceCount() + "\n");
        }
        using (vtkGDCMImageReader reader3 = new vtkGDCMImageReader())
        {
            System.Console.WriteLine( "GetReferenceCount: " + reader3.GetReferenceCount() + "\n");
        }
        using (vtkGDCMImageWriter writer3 = vtkGDCMImageWriter.New())
        {
            System.Console.WriteLine( "GetReferenceCount: " + writer3.GetReferenceCount() + "\n");
        }
        // C# destructor will call ->Delete on all C++ object as expected.
        return 0;
    }
}

```

## 12.147 Compute3DSpacing.cxx

```
/*=====
```

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```

=====*/
#include "vtkGDCMImageReader2.h"
#include "vtkImageChangeInformation.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"
#include "gdcmIPPSorter.h"
#ifdef vtkFloatingPointType
#define vtkFloatingPointType double
#endif
/*
 * Simple example to check computation of spacing within vtkGDCMImageReader2
 * This is a direct implementation of:
 *
 *
 *      http://gdcm.sourceforge.net/wiki/index.php/Using_GDCM_API#Automatic_ordering_of_slices_for_vtkGDCMImageReader.SetFileNames
 *
 * For more advanced information on how 3D spacing is being computed see:
 *
 * - http://gdcm.sourceforge.net/html/classgdcm_1_1IPPSorter.html
 *
 * Usage:
 *
 * $ Compute3DSpacing SIEMENS_MAGNETOM-12-MONO2-FileSeq0.dcm \
 *   SIEMENS_MAGNETOM-12-MONO2-FileSeq1.dcm \
 *   SIEMENS_MAGNETOM-12-MONO2-FileSeq2.dcm \
 *   SIEMENS_MAGNETOM-12-MONO2-FileSeq3.dcm
 */
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;
    std::vector<std::string> filenames;
    for( int i = 1; i < argc; ++i )
    {
        filenames.push_back( argv[i] );
    }
    gdcm::IPPSorter s;
    s.SetComputeZSpacing( true );
    s.SetZSpacingTolerance( 1e-3 );
    bool b = s.Sort( filenames );
    if( !b )
    {
        std::cerr << "Failed to sort files" << std::endl;
        return 1;
    }
    std::cout << "Sorting succeeded:" << std::endl;
    //s.Print( std::cout );
    std::cout << "Found z-spacing:" << std::endl;
    std::cout << s.GetZSpacing() << std::endl;
    const double ippszspacing = s.GetZSpacing();
    const std::vector<std::string> & sorted = s.GetFileNames();
    vtkGDCMImageReader2 * reader = vtkGDCMImageReader2::New();
    vtkStringArray *files = vtkStringArray::New();
    std::vector< std::string >::const_iterator it = sorted.begin();
    for( ; it != sorted.end(); ++it )
    {
        const std::string &f = *it;
        files->InsertNextValue( f.c_str() );
    }
    reader->SetFileNames( files );
    reader->Update();
    const vtkFloatingPointType *spacing = reader->GetOutput()->GetSpacing();
    vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
    #if (VTK_MAJOR_VERSION >= 6)
    v16->SetInputConnection( reader->GetOutputPort() );
    #else
    v16->SetInput( reader->GetOutput() );
    #endif
    v16->SetOutputSpacing( spacing[0], spacing[1], ippszspacing );
    v16->Update();
    v16->GetOutput()->Print( std::cout );
    return 0;
}

```

## 12.148 Convert16BitsTo8Bits.cxx

```

/*=====

```

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```

=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageCast.h"
#include "vtkVersion.h"
#include "gdcmTesting.h"
// The following file is 16/16/15 but the scalar range of the image is [0,192]
// it could be safely stored as 8bits instead:
// gdcmData/012345.002.050.dcm
int main(int, char *[])
{
    const char *directory = gdcm::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/012345.002.050.dcm";
    std::cout << file << std::endl;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( file.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );
    vtkImageCast *cast = vtkImageCast::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cast->SetInputConnection( reader->GetOutputPort() );
    #else
        cast->SetInput( reader->GetOutput() );
    #endif
    cast->SetOutputScalarTypeToUnsignedChar();
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( "/tmp/cast.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( cast->GetOutputPort() );
    #else
        writer->SetInput( cast->GetOutput() );
    #endif
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->Write();
    reader->Delete();
    cast->Delete();
    writer->Delete();
    return 0;
}

```

## 12.149 ConvertMultiFrameToSingleFrame.cxx

/\*=====

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```

=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"

```

```

#include "gdcmTesting.h"
#include "gdcmFilenameGenerator.h"
int main(int argc, char *argv[])
{
    std::string filename;
    if( argc <= 1 )
    {
        const char *directory = gdcm::Testing::GetDataRoot();
        if(!directory) return 1;
        std::string file = std::string(directory) + "/US-PAL-8-10x-echo.dcm";
        filename = file;
    }
    else
    {
        filename = argv[1];
    }
    std::cout << "file: " << filename << std::endl;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( filename.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );
    int dims[3];
    reader->GetOutput()->GetDimensions( dims );
    std::ostringstream os;
    os << "singleframe";
    os << "%04d.dcm";
    gdcm::FilenameGenerator fg;
    fg.SetPattern( os.str().c_str() );
    unsigned int nfiles = dims[2];
    fg.SetNumberOfFileNames( nfiles );
    bool b = fg.Generate();
    if( !b )
    {
        std::cerr << "FilenameGenerator::Generate() failed" << std::endl;
        return 1;
    }
    if( !fg.GetNumberOfFileNames() )
    {
        std::cerr << "FilenameGenerator::Generate() failed somehow..." << std::endl;
        return 1;
    }
    // By default write them as Secondary Capture (for portability)
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    vtkStringArray *filenames = vtkStringArray::New();
    for(unsigned int i = 0; i < fg.GetNumberOfFileNames(); ++i)
    {
        filenames->InsertNextValue( fg.GetFilename(i) );
    }
    assert( filenames->GetNumberOfValues() == (int)fg.GetNumberOfFileNames() );
    writer->SetFileNames( filenames );
    filenames->Delete();
    writer->SetFileDimensionality( 2 );
#ifdef VTK_MAJOR_VERSION >= 6
    writer->SetInputConnection( reader->GetOutputPort() );
#else
    writer->SetInput( reader->GetOutput() );
#endif
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->Write();
    reader->Delete();
    writer->Delete();
    return 0;
}

```

## 12.150 ConvertRGBToLuminance.cxx

```

/*=====

```

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```

=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageLuminance.h"
#include "vtkVersion.h"
#include "gdcmTesting.h"
// There is no such thing as MR Image Storage + Photometric Interpretation = RGB
// let's rewrite that into a proper single component image:
int main(int, char *[])
{
    const char *directory = gdcm::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/SIEMENS-MR-RGB-16Bits.dcm";
    std::cout << file << std::endl;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( file.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );
    vtkImageLuminance *luminance = vtkImageLuminance::New();
    #if (VTK_MAJOR_VERSION >= 6)
        luminance->SetInputConnection( reader->GetOutputPort() );
    #else
        luminance->SetInput( reader->GetOutput() );
    #endif
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( "/tmp/bla.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( luminance->GetOutputPort() );
    #else
        writer->SetInput( luminance->GetOutput() );
    #endif
    //writer->SetImageFormat( reader->GetImageFormat() ); // Do NOT pass image format
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->Write();
    // TODO:
    //vtkImageAppendComponents.s
    reader->Delete();
    luminance->Delete();
    writer->Delete();
    return 0;
}

```

## 12.151 ConvertSingleBitTo8Bits.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.
=====*/

```

```

#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageCast.h"
#include "vtkPointData.h"
#include "vtkBitArray.h"
#include "vtkUnsignedCharArray.h"
#include "vtkVersion.h"
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        return 1;
    }
    const char *filename = argv[1];

```

```

const char *outfilename = argv[2];
vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
reader->SetFileName( filename );
reader->Update();
//reader->GetOutput()->Print( std::cout );
vtkDataArray* array = reader->GetOutput()->GetPointData()->GetScalars();
vtkBitArray *barray = vtkBitArray::SafeDownCast( array );
if( !barray ) return false;
vtkIdType nvalues = array->GetNumberOfTuples();
vtkUnsignedCharArray *uarray = vtkUnsignedCharArray::New();
uarray->SetNumberOfTuples( nvalues );
for(vtkIdType i = 0; i < nvalues; ++i)
{
    uarray->SetValue( i, (unsigned char)barray->GetValue(i) );
}
vtkImageData *copy = vtkImageData::New();
// http://www.vtk.org/Wiki/VTK/VTK_6_Migration/Changes_to_Scalars_Manipulation_Functions#AllocateScalars.28.29
copy->SetExtent( reader->GetOutput()->GetExtent() );
#if (VTK_MAJOR_VERSION >= 6)
copy->AllocateScalars(VTK_UNSIGNED_CHAR, 3);
#else
copy->SetScalarType( VTK_UNSIGNED_CHAR );
copy->AllocateScalars();
#endif
//uarray->Print( std::cout );
//copy->GetPointData()->GetScalars()->Print( std::cout );
copy->GetPointData()->SetScalars( uarray );
uarray->Delete();
vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
writer->SetFileName( outfile );
//writer->SetInput( cast->GetOutput() );
#if (VTK_MAJOR_VERSION >= 6)
writer->SetInputData( copy );
#else
writer->SetInput( copy );
#endif
writer->SetImageFormat( reader->GetImageFormat() );
writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
writer->SetDirectionCosines( reader->GetDirectionCosines() );
writer->SetShift( reader->GetShift() );
writer->SetScale( reader->GetScale() );
writer->SetFileDimensionality( reader->GetFileDimensionality() );
writer->Write();
reader->Delete();
copy->Delete();
writer->Delete();
return 0;
}

```

## 12.152 CreateFakePET.cxx

```

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Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageWriter.h"
#include "vtkImageReader.h"
#include "vtkImageCast.h"
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkDataArray.h"
#include "vtkMedicalImageProperties.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"
#include "gdcmTrace.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"

```

```

#include "gdcmFilenameGenerator.h"
/*
 * Minimal example to create a fake RTDOSE file. The data contains a sphere
 * just for testing.
 * The vtkMedicalImageProperties is not properly filled, but only contains a
 * single field which is required to set the proper SOP Class
 */
int main(int, char *[])
{
    gdcm::Trace::DebugOn();
    const vtkIdType xSize = 512;
    const vtkIdType ySize = 512;
    const vtkIdType zSize = 512;
    // Create the filenames in advance to supply to the vtkGDCMImageWriter
    std::ostream os;
    os << "PT";
    os << "%03d.dcm";
    gdcm::FilenameGenerator fg;
    fg.SetPattern( os.str().c_str() );
    unsigned int nfiles = zSize;
    fg.SetNumberOfFilenames( nfiles );
    bool b = fg.Generate();
    if( !b )
    {
        std::cerr << "FilenameGenerator::Generate() failed" << std::endl;
        return 1;
    }
    if( !fg.GetNumberOfFilenames() )
    {
        std::cerr << "FilenameGenerator::Generate() failed somehow..." << std::endl;
        return 1;
    }
    vtkStringArray *filenames = vtkStringArray::New();
    for(unsigned int i = 0; i < fg.GetNumberOfFilenames(); ++i)
    {
        filenames->InsertNextValue( fg.GetFilename(i) );
    }
    vtkImageData *image = vtkImageData::New();
    image->SetDimensions(xSize,ySize,zSize);
    image->SetOrigin(-350.684,350.0,890.76);
    image->SetSpacing(5.4688,-5.4688,-3.27);
    #if VTK_MAJOR_VERSION <= 5
        image->SetNumberOfScalarComponents(1);
        image->SetScalarTypeToDouble();
    #else
        image->AllocateScalars(VTK_DOUBLE,1);
    #endif
    double pt[3];
    for( int z = 0; z < zSize; ++z )
        for( int y = 0; y < ySize; ++y )
            for( int x = 0; x < xSize; ++x )
            {
                pt[0] = x;
                pt[1] = y;
                pt[2] = z;
                pt[0] -= xSize / 2;
                pt[1] -= ySize / 2;
                pt[2] -= zSize / 2;
                pt[0] /= xSize / 2;
                pt[1] /= ySize / 2;
                pt[2] /= zSize / 2;
                const double unit = pt[0] * pt[0] + pt[1] * pt[1] + pt[2] * pt[2];
                const double inval = unit <= 1. ? (3 * unit + 7) : 0.; // just for fun => max == 10.
                double* pixel= static_cast<double*>(image->GetScalarPointer(x,y,z));
                pixel[0] = inval;
            }
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileDimensionality( 2 );
    writer->SetFileNames(filenames);
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputData( image );
    #else
        writer->SetInput( image );
    #endif
    writer->GetMedicalImageProperties()->SetSliceThickness("1.5");
    writer->GetMedicalImageProperties()->SetModality( "PT" );
    writer->SetScale( 0.0042 ); // why not
    writer->Write();
    image->Delete();
    writer->Delete();
    return 0;
}

```

```
}

```

## 12.153 CreateFakeRTDOSE.cxx

```
/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageWriter.h"
#include "vtkImageReader.h"
#include "vtkImageCast.h"
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkDataArray.h"
#include "vtkMedicalImageProperties.h"
#include "vtkVersion.h"
#include "gdcmTrace.h"
#include "gdcmReader.h"
#include "gdcmWriter.h"
#include "gdcmAttribute.h"
/*
 * Minimal example to create a fake RTDOSE file. The data contains a sphere
 * just for testing.
 * The vtkMedicalImageProperties is not properly filled, but only contains a
 * single field which is required to set the proper SOP Class
 */
int main(int, char *[])
{
    //gdcm::Trace::DebugOn();
    const vtkIdType xSize = 512;
    const vtkIdType ySize = 512;
    const vtkIdType zSize = 512;
    vtkImageData *image = vtkImageData::New();
    image->SetDimensions(xSize,ySize,zSize);
    image->SetOrigin(-350.684,350.0,890.76);
    image->SetSpacing(5.4688,-5.4688,-3.27);
    #if VTK_MAJOR_VERSION <= 5
    image->SetNumberOfScalarComponents(1);
    image->SetScalarTypeToDouble();
    #else
    image->AllocateScalars(VTK_DOUBLE,1);
    #endif
    double pt[3];
    for( int z = 0; z < zSize; ++z )
        for( int y = 0; y < ySize; ++y )
            for( int x = 0; x < xSize; ++x )
            {
                pt[0] = x;
                pt[1] = y;
                pt[2] = z;
                pt[0] -= xSize / 2;
                pt[1] -= ySize / 2;
                pt[2] -= zSize / 2;
                pt[0] /= xSize / 2;
                pt[1] /= ySize / 2;
                pt[2] /= zSize / 2;
                const double unit = pt[0] * pt[0] + pt[1] * pt[1] + pt[2] * pt[2];
                const double inval = unit <= 1. ? (3 * unit + 7) : 0.; // just for fun => max == 10.
                double* pixel= static_cast<double*>(image->GetScalarPointer(x,y,z));
                pixel[0] = inval;
            }
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileDimensionality( 3 );
    writer->SetFileName( "rtdose.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
    writer->SetInputData( image );
    #else
    writer->SetInput( image );

```

```

#endif
writer->GetMedicalImageProperties()->SetSliceThickness("1.5");
writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Units", "GY");
writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Summation Type", "PLAN");
writer->GetMedicalImageProperties()->AddUserDefinedValue( "Dose Type", "PHYSICAL");
writer->GetMedicalImageProperties()->AddUserDefinedValue( "Frame of Reference UID",
    "1.3.12.2.1107.5.6.1.68100.30270111041215391275000000001");
writer->GetMedicalImageProperties()->SetModality( "RTDOSE" );
//writer->GetMedicalImageProperties()->SetModality( "PT" ); // debug
writer->SetScale( 0.0042 ); // why not
writer->Write();
image->Delete();
writer->Delete();
// BEGIN HACK
// In GDCM version 2.4.3 and before, the following tag was missing which caused issue with some RTDose
// software:
// Open the DICOM file that was temporarily created. This will allow me to use
// GDCM to append specific tags that allow the RTDOSE to be associated with the
// relevant CT images.
gdcm::Reader reader2;
reader2.SetFileName("rtdose.dcm" );
reader2.Read();
gdcm::File &file = reader2.GetFile();
gdcm::DataSet &ds = file.GetDataSet();
// Required by some software and not automatically added by GDCM in old version
gdcm::Attribute<0x0028,0x0009> framePointer;
framePointer.SetNumberOfValues(1);
framePointer.SetValue( gdcm::Tag(0x3004,0x000C) );
ds.Replace( framePointer.GetAsDataElement() );
gdcm::Writer writer2;
writer2.CheckFileMetaInformationOff();
writer2.SetFileName("rtdose2.dcm");
writer2.SetFile( file );
writer2.Write();
// END HACK
return 0;
}

```

## 12.154 GenerateRTSTRUCT.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMPolyDataWriter.h"
#include "vtkGDCMPolyDataReader.h"
#include "vtkPolyData.h"
#include "vtkPolyDataReader.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRTStructSetProperties.h"
#include "vtkStringArray.h"
#include "vtkAppendPolyData.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkImageData.h"
#include "vtkVersion.h"
#include <algorithm> //for std::find
#include "gdcmDirectoryHelper.h"
using namespace gdcm;

```

```

//view each organ independently of the others, to make sure that
//organ names correspond to actual segmentations.
void ShowOrgan(vtkPolyData* inData)
{
    // Now we'll look at it.
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
#ifdef VTK_MAJOR_VERSION >= 6
    cubeMapper->SetInputData( inData );
#else
    cubeMapper->SetInput( inData );
#endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty *property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();
    vtkRenderer *renderer = vtkRenderer::New();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->AddRenderer(renderer);
    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
    renderer->AddActor(cubeActor);
    renderer->ResetCamera();
    renderer->SetBackground(1,1,1);
    renWin->SetSize(300,300);
    renWin->Render();
    iren->Start();
    cubeMapper->Delete();
    cubeActor->Delete();
    renderer->Delete();
    renWin->Delete();
    iren->Delete();
}
/*
 * Full application which ... RTSTRUCT
 */
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " directory-with-rtstruct-and-ct-images\n";
        return 1;
    }
    std::string theDirName(argv[1]);
    Directory::FileNamesType theRTSeries =
        DirectoryHelper::GetRTStructSeriesUIDs(theDirName);
    gdc::Directory theDir;
    theDir.Load(argv[1]);
    if (theRTSeries.empty())
    {
        std::cerr << "No RTStructs found for the test, ending." << std::endl;
        return 1;
    }
    for (size_t q = 0; q < theRTSeries.size(); q++)
    {
        Directory::FileNamesType theRTNames =
            DirectoryHelper::GetFileNamesFromSeriesUIDs(theDirName, theRTSeries[q]);
        if (theRTNames.empty()){
            std::cerr << "Unable to load RT Series " << theRTSeries[q] << ", continuing. " << std::endl;
            continue;
        }
        vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
        reader->SetFileName( theRTNames[0].c_str() );
        reader->Update();
        //std::cout << reader->GetMedicalImageProperties()->GetStudyDate() << std::endl;
        vtkGDCMPolyDataWriter * writer = vtkGDCMPolyDataWriter::New();
        int numMasks = reader->GetNumberOfOutputPorts() + 1; //add a blank one in
        writer->SetNumberOfInputPorts( numMasks );
        std::string thePotentialName = theDirName + "/" + "GDCMTestRTStruct." + theRTSeries[q] + ".dcm";
        gdc::Directory::FileNamesType theFileNames = theDir.GetFileNames();
        //keep renaming the output until we get something that doesn't overwrite what was there already
        int count = 0;
        while (std::find(theFileNames.begin(), theFileNames.end(), thePotentialName) != theFileNames.end())
        {
            char buff[255];
            snprintf(buff, sizeof(buff), "%d", count);
            thePotentialName = theDirName + "/" + "GDCMTestRTStruct." + buff + "." + theRTSeries[q] + ".dcm";
        }
        writer->SetFileName( thePotentialName.c_str());
        writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
        //this line is cheating, we won't have the same stuff, and may not have a struct
    }
}

```

```

//to start with.
//have to go back to the original data to reconstruct the RTStructureSetProperties
//writer->SetRTStructSetProperties( reader->GetRTStructSetProperties() );
//writer->Write();
//loop through the outputs in order to write them out as if they had been created and appended
vtkStringArray* roiNames = vtkStringArray::New();
vtkStringArray* roiAlgorithms = vtkStringArray::New();
vtkStringArray* roiTypes = vtkStringArray::New();
roiNames->SetNumberOfValues(numMasks);
roiAlgorithms->SetNumberOfValues(numMasks);
roiTypes->SetNumberOfValues(numMasks);
vtkAppendPolyData* append = vtkAppendPolyData::New();
//ok, now we'll add a blank organ
//the blank organ is to test to ensure that blank organs work; there have been crash reports
//this code is added at the beginning to ensure that the blank organs are read
//and preserved as individual organs.
vtkPolyData* blank = vtkPolyData::New();
#if (VTK_MAJOR_VERSION >= 6)
writer->SetInputData(0, blank);
#else
writer->SetInput(0, blank);
#endif
roiNames->InsertValue(0, "blank");
roiAlgorithms->InsertValue(0, "blank");
roiTypes->InsertValue(0, "ORGAN");
//note the offsets used to place the blank rtstruct at the beginning of the newly generated RT.
//the idea is to run the program twice; first to generate an rtstruct with a blank mask (making
//sure that that functionality works), and then a second time to make sure that everything is
//being read properly. Multiple organs with the same name could cause some strangenesses.
for (int i = 1; i < numMasks; ++i)
{
#if (VTK_MAJOR_VERSION >= 6)
writer->SetInputConnection(i, reader->GetOutputPort(i-1));
append->AddInputConnection(reader->GetOutputPort(i-1));
#else
writer->SetInput(i, reader->GetOutput(i-1));
append->AddInput(reader->GetOutput(i-1));
#endif
std::string theString = reader->GetRTStructSetProperties()->GetStructureSetROIName(i-1);
roiNames->InsertValue(i, theString);
theString = reader->GetRTStructSetProperties()->GetStructureSetROIGenerationAlgorithm(i-1);
roiAlgorithms->InsertValue(i, theString);
theString = reader->GetRTStructSetProperties()->GetStructureSetRTROIInterpretedType(i-1);
roiTypes->InsertValue(i, theString);
ShowOrgan(reader->GetOutput(i-1));
}
vtkRTStructSetProperties* theProperties = vtkRTStructSetProperties::New();
writer->SetRTStructSetProperties(theProperties);
writer->InitializeRTStructSet(theDirName,
reader->GetRTStructSetProperties()->GetStructureSetLabel(),
reader->GetRTStructSetProperties()->GetStructureSetName(),
roiNames, roiAlgorithms, roiTypes);
writer->SetRTStructSetProperties(theProperties);
writer->Write();
// print reader output:
reader->Print( std::cout );
// print first output:
reader->GetOutput()->Print( std::cout );
reader->Delete();
append->Delete();
roiNames->Delete();
roiTypes->Delete();
theProperties->Delete();
roiAlgorithms->Delete();
blank->Delete();
writer->Delete();
}
return 0;
}

```

## 12.155 MagnifyFile.cxx

```
/*=====
```

Program: GDCM (Grassroots DICOM). A DICOM library

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```
=====*/
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkImageData.h"
#include "vtkImageMagnify.h"
#include "vtkImageCast.h"
#include "vtkVersion.h"
#include "gdcmTesting.h"
#include "gdcmSystem.h"
// This is a simple test to magnify an image that is known to give excellent
// compression ratio. This will be our test for those large image
int main(int, char *[])
{
    const char *directory = gdcm::Testing::GetDataRoot();
    if(!directory) return 1;
    std::string file = std::string(directory) + "/test.acr";
    std::cout << file << std::endl;
    if( !gdcm::System::FileExists( file.c_str() ) ) return 1;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( file.c_str() );
    reader->Update();
    //reader->GetOutput()->Print( std::cout );
    vtkImageCast *cast = vtkImageCast::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cast->SetInputConnection( reader->GetOutputPort() );
    #else
        cast->SetInput( reader->GetOutput() );
    #endif
    cast->SetOutputScalarTypeToUnsignedShort();
    vtkImageMagnify *magnify = vtkImageMagnify::New();
    #if (VTK_MAJOR_VERSION >= 6)
        magnify->SetInputConnection( cast->GetOutputPort() );
    #else
        magnify->SetInput( cast->GetOutput() );
    #endif
    magnify->SetInterpolate( 1 );
    magnify->SetInterpolate( 0 );
    int factor = 100;
    magnify->SetMagnificationFactors( factor, factor, 1);
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetFileName( "/tmp/bla.dcm" );
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( magnify->GetOutputPort() );
    #else
        writer->SetInput( magnify->GetOutput() );
    #endif
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->Write();
    // TODO:
    //vtkImageAppendComponents.h
    reader->Delete();
    magnify->Delete();
    writer->Delete();
    return 0;
}
```

## 12.156 gdcmorthoplanes.cxx

```
/*=====

Program:  GDCM (Grassroots DICOM). A DICOM library

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```



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```

=====*/
#include "vtkActor.h"
#include "vtkCamera.h"
#include "vtkMatrix4x4.h"
#include "vtkTransform.h"
#include "vtkAssembly.h"
#include "vtkCellPicker.h"
#include "vtkCommand.h"
#include "vtkImageActor.h"
#include "vtkImageMapToColors.h"
#include "vtkImageOrthoPlanes.h"
#include "vtkImagePlaneWidget.h"
#include "vtkImageReader.h"
#include "vtkInteractorEventRecorder.h"
#include "vtkLookupTable.h"
#include "vtkOutlineFilter.h"
#include "vtkPolyDataMapper.h"
#include "vtkProperty.h"
#include "vtkRenderWindow.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkRenderer.h"
#include "vtkVolume16Reader.h"
#include "vtkImageData.h"
#include "vtkImageChangeInformation.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkAxesActor.h"
#include "vtkCaptionActor2D.h"
#include "vtkTextProperty.h"
#include "vtkPropAssembly.h"
#include "vtkGDCMImageReader.h"
#include "vtkGDCMImageWriter.h"
#include "vtkStringArray.h"
#include "vtkVersion.h"
#include "gdcmsystem.h"
#include "gdcmdir.h"
#include "gdcmpp.h"
#ifdef vtkFloatingPointType
#define vtkFloatingPointType double
#endif
//-----
class vtkOrthoPlanesCallback : public vtkCommand
{
public:
    static vtkOrthoPlanesCallback *New()
    { return new vtkOrthoPlanesCallback; }
    void Execute( vtkObject *caller, unsigned long vtkNotUsed( event ),
        void *callData )
    {
        vtkImagePlaneWidget* self =
            reinterpret_cast< vtkImagePlaneWidget* >( caller );
        if(!self) return;
        double* wl = static_cast<double*>( callData );
        if ( self == this->WidgetX )
        {
            this->WidgetY->SetWindowLevel(wl[0],wl[1],1);
            this->WidgetZ->SetWindowLevel(wl[0],wl[1],1);
        }
        else if( self == this->WidgetY )
        {
            this->WidgetX->SetWindowLevel(wl[0],wl[1],1);
            this->WidgetZ->SetWindowLevel(wl[0],wl[1],1);
        }
        else if (self == this->WidgetZ)
        {
            this->WidgetX->SetWindowLevel(wl[0],wl[1],1);
            this->WidgetY->SetWindowLevel(wl[0],wl[1],1);
        }
    }
};

int main( int argc, char *argv[] )
{
    //char* fname = vtkTestUtilities::ExpandDataFileName(argc, argv, "Data/headsq/quarter");

```

```

//vtkVolume16Reader* v16 = vtkVolume16Reader::New();
// v16->SetDataDimensions( 64, 64);
// v16->SetDataByteOrderToLittleEndian();
// v16->SetImageRange( 1, 93);
// v16->SetDataSpacing( 3.2, 3.2, 1.5);
// v16->SetFilePrefix( fname );
// v16->SetDataMask( 0x7fff);
// v16->Update();
std::vector<std::string> filenames;
if( argc < 2 )
{
    std::cerr << argv[0] << " filename1.dcm [filename2.dcm ...]\n";
    return 1;
}
else
{
    // Is it a single directory ? If so loop over all files contained in it:
    const char *filename = argv[1];
    if( argc == 2 && gdcm::System::FileIsDirectory( filename ) )
    {
        std::cout << "Loading directory: " << filename << std::endl;
        bool recursive = false;
        gdcm::Directory d;
        d.Load(filename, recursive);
        gdcm::Directory::FileNamesType const &files = d.GetFilesNames();
        for( gdcm::Directory::FileNamesType::const_iterator it = files.begin(); it != files.end(); ++it )
        {
            filenames.push_back( it->c_str() );
        }
    }
    else // list of files passed directly on the cmd line:
        // discard non-existing or directory
    {
        for(int i=1; i < argc; ++i)
        {
            filename = argv[i];
            if( gdcm::System::FileExists( filename ) )
            {
                if( gdcm::System::FileIsDirectory( filename ) )
                {
                    std::cerr << "Discarding directory: " << filename << std::endl;
                }
                else
                {
                    filenames.push_back( filename );
                }
            }
            else
            {
                std::cerr << "Discarding non existing file: " << filename << std::endl;
            }
        }
    }
    //names->Print( std::cout );
}
vtkGDCMImageReader * reader = vtkGDCMImageReader::New();
double ippzspacing;
if( filenames.size() > 1 )
{
    //gdcm::Trace::DebugOn();
    //gdcm::Trace::WarningOn();
    gdcm::IPPSorter s;
    s.SetComputeZSpacing( true );
    s.SetZSpacingTolerance( 1e-3 );
    bool b = s.Sort( filenames );
    if( !b )
    {
        std::cerr << "Failed to sort files" << std::endl;
        return 1;
    }
    std::cout << "Sorting succeeded:" << std::endl;
    s.Print( std::cout );
    std::cout << "Found z-spacing:" << std::endl;
    std::cout << s.GetZSpacing() << std::endl;
    ippzspacing = s.GetZSpacing();
    const std::vector<std::string> & sorted = s.GetFilesNames();
    vtkStringArray *files = vtkStringArray::New();
    std::vector< std::string >::const_iterator it = sorted.begin();
    for( ; it != sorted.end(); ++it )
    {
        const std::string &f = *it;

```

```

        files->InsertNextValue( f.c_str() );
    }
    reader->SetFileNames( files );
    //reader->SetFileLowerLeft( 1 );
    reader->Update(); // important
    files->Delete();
}
else
{
    reader->SetFileName( argv[1] );
    reader->Update(); // important
    ippzspacing = reader->GetOutput()->GetSpacing()[2];
    ippzspacing = 4;
}
//reader->GetOutput()->Print( std::cout );
//vtkFloatingPointType range[2];
//reader->GetOutput()->GetScalarRange(range);
//std::cout << "Range: " << range[0] << " " << range[1] << std::endl;
const vtkFloatingPointType *spacing = reader->GetOutput()->GetSpacing();
vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
#if (VTK_MAJOR_VERSION >= 6)
    v16->SetInputConnection( reader->GetOutputPort() );
#else
    v16->SetInput( reader->GetOutput() );
#endif
v16->SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
v16->Update();
#if 0
    vtkGDCMImageWriter *writer = vtkGDCMImageWriter::New();
    writer->SetInput( v16->GetOutput() );
    writer->SetFileLowerLeft( reader->GetFileLowerLeft() );
    writer->SetDirectionCosines( reader->GetDirectionCosines() );
    writer->SetImageFormat( reader->GetImageFormat() );
    writer->SetFileDimensionality( 3 ); //reader->GetFileDimensionality() );
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetShift( reader->GetShift() );
    writer->SetScale( reader->GetScale() );
    writer->SetFileName( "out.dcm" );
    writer->Write();
#endif
    vtkOutlineFilter* outline = vtkOutlineFilter::New();
    outline->SetInputConnection(v16->GetOutputPort());
    vtkPolyDataMapper* outlineMapper = vtkPolyDataMapper::New();
    outlineMapper->SetInputConnection(outline->GetOutputPort());
    vtkActor* outlineActor = vtkActor::New();
    outlineActor->SetMapper( outlineMapper );
    vtkRenderer* ren1 = vtkRenderer::New();
    vtkRenderer* ren2 = vtkRenderer::New();
    vtkRenderWindow* renWin = vtkRenderWindow::New();
    renWin->AddRenderer(ren2);
    renWin->AddRenderer(ren1);
    vtkRenderWindowInteractor* iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
    vtkCellPicker* picker = vtkCellPicker::New();
    picker->SetTolerance(0.005);
    vtkProperty* ipwProp = vtkProperty::New();
    //assign default props to the ipw's texture plane actor
    vtkImagePlaneWidget* planeWidgetX = vtkImagePlaneWidget::New();
    planeWidgetX->SetInteractor( iren );
    planeWidgetX->SetKeyPressActivationValue('x');
    planeWidgetX->SetPicker(picker);
    planeWidgetX->RestrictPlaneToVolumeOn();
    planeWidgetX->GetPlaneProperty()->SetColor(1,0,0);
    planeWidgetX->SetTexturePlaneProperty(ipwProp);
    planeWidgetX->TextureInterpolateOff();
    planeWidgetX->SetResliceInterpolateToNearestNeighbour();
    if (VTK_MAJOR_VERSION >= 6)
        planeWidgetX->SetInputConnection(v16->GetOutputPort());
    else
        planeWidgetX->SetInput(v16->GetOutput());
    endif
    planeWidgetX->SetPlaneOrientationToXAxes();
    //planeWidgetX->SetSliceIndex(32);
    planeWidgetX->DisplayTextOn();
    planeWidgetX->On();
    planeWidgetX->InteractionOff();
    planeWidgetX->InteractionOn();
    vtkImagePlaneWidget* planeWidgetY = vtkImagePlaneWidget::New();
    planeWidgetY->SetInteractor( iren );
    planeWidgetY->SetKeyPressActivationValue('y');
    planeWidgetY->SetPicker(picker);

```

```

    planeWidgetY->GetPlaneProperty()->SetColor(1,1,0);
    planeWidgetY->SetTexturePlaneProperty(ipwProp);
    planeWidgetY->TextureInterpolateOn();
    planeWidgetY->SetResliceInterpolateToLinear();
    #if (VTK_MAJOR_VERSION >= 6)
        planeWidgetY->SetInputConnection(v16->GetOutputPort());
    #else
        planeWidgetY->SetInput(v16->GetOutput());
    #endif
    planeWidgetY->SetPlaneOrientationToYAxes();
    //planeWidgetY->SetSlicePosition(102.4);
    planeWidgetY->SetLookupTable( planeWidgetX->GetLookupTable());
    planeWidgetY->DisplayTextOn();
    planeWidgetY->UpdatePlacement();
    planeWidgetY->On();
    vtkImagePlaneWidget* planeWidgetZ = vtkImagePlaneWidget::New();
    planeWidgetZ->SetInteractor( iren);
    planeWidgetZ->SetKeyPressActivationValue('z');
    planeWidgetZ->SetPicker(picker);
    planeWidgetZ->GetPlaneProperty()->SetColor(0,0,1);
    planeWidgetZ->SetTexturePlaneProperty(ipwProp);
    planeWidgetZ->TextureInterpolateOn();
    planeWidgetZ->SetResliceInterpolateToCubic();
    #if (VTK_MAJOR_VERSION >= 6)
        planeWidgetZ->SetInputConnection(v16->GetOutputPort());
    #else
        planeWidgetZ->SetInput(v16->GetOutput());
    #endif
    planeWidgetZ->SetPlaneOrientationToZAxes();
    //planeWidgetZ->SetSliceIndex(25);
    planeWidgetZ->SetLookupTable( planeWidgetX->GetLookupTable());
    planeWidgetZ->DisplayTextOn();
    planeWidgetZ->On();
    vtkImageOrthoPlanes *orthoPlanes = vtkImageOrthoPlanes::New();
    orthoPlanes->SetPlane(0, planeWidgetX);
    orthoPlanes->SetPlane(1, planeWidgetY);
    orthoPlanes->SetPlane(2, planeWidgetZ);
    orthoPlanes->ResetPlanes();
    vtkOrthoPlanesCallback* cbk = vtkOrthoPlanesCallback::New();
    cbk->WidgetX = planeWidgetX;
    cbk->WidgetY = planeWidgetY;
    cbk->WidgetZ = planeWidgetZ;
    planeWidgetX->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
    planeWidgetY->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
    planeWidgetZ->AddObserver( vtkCommand::EndWindowLevelEvent, cbk );
    cbk->Delete();
    double wl[2];
    planeWidgetZ->GetWindowLevel(wl);
    // Add a 2D image to test the GetReslice method
    //
    vtkImageMapToColors* colorMap = vtkImageMapToColors::New();
    colorMap->PassAlphaToOutputOff();
    colorMap->SetActiveComponent(0);
    colorMap->SetOutputFormatToLuminance();
    #if (VTK_MAJOR_VERSION >= 6)
        colorMap->SetInputData(planeWidgetZ->GetResliceOutput());
    #else
        colorMap->SetInput(planeWidgetZ->GetResliceOutput());
    #endif
    colorMap->SetLookupTable(planeWidgetX->GetLookupTable());
    vtkImageActor* imageActor = vtkImageActor::New();
    imageActor->PickableOff();
    #if (VTK_MAJOR_VERSION >= 6)
        imageActor->SetInputData(colorMap->GetOutput());
    #else
        imageActor->SetInput(colorMap->GetOutput());
    #endif
    // Add the actors
    //
    ren1->AddActor( outlineActor);
    ren2->AddActor( imageActor);
    ren1->SetBackground( 0.1, 0.1, 0.2);
    ren2->SetBackground( 0.2, 0.1, 0.2);
    renWin->SetSize( 600, 350);
    ren1->SetViewport(0,0,0.58333,1);
    ren2->SetViewport(0.58333,0,1,1);
    // Set the actors' postions
    //
    renWin->Render();
    //iren->SetEventPosition( 175,175);
    //iren->SetKeyCode('r');

```

```

//iren->InvokeEvent(vtkCommand::CharEvent,NULL);
//iren->SetEventPosition( 475,175);
//iren->SetKeyCode('r');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);
//renWin->Render();
//ren1->GetActiveCamera()->Elevation(110);
//ren1->GetActiveCamera()->SetViewUp(0, 0, -1);
//ren1->GetActiveCamera()->Azimuth(45);
//ren1->GetActiveCamera()->Dolly(1.15);
ren1->ResetCameraClippingRange();
vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
cube->SetXPlusFaceText ( "R" );
cube->SetXMinusFaceText ( "L" );
cube->SetYPlusFaceText ( "A" );
cube->SetYMinusFaceText ( "P" );
cube->SetZPlusFaceText ( "H" );
cube->SetZMinusFaceText ( "F" );
cube->SetFaceTextScale( 0.666667 );
vtkAxesActor* axes2 = vtkAxesActor::New();
vtkMatrix4x4 *invert = vtkMatrix4x4::New();
invert->DeepCopy( reader->GetDirectionCosines() );
invert->Invert();
// simulate a left-handed coordinate system
//
vtkTransform *transform = vtkTransform::New();
transform->Identity();
//transform->RotateY(90);
transform->Concatenate(invert);
axes2->SetShaftTypeToCylinder();
axes2->SetUserTransform( transform );
cube->GetAssembly()->SetUserTransform( transform );
axes2->SetTotalLength( 1.5, 1.5, 1.5 );
axes2->SetCylinderRadius( 0.500 * axes2->GetCylinderRadius() );
axes2->SetConeRadius ( 1.025 * axes2->GetConeRadius() );
axes2->SetSphereRadius ( 1.500 * axes2->GetSphereRadius() );
vtkTextProperty* tprop = axes2->GetXAxisCaptionActor2D()->
    GetCaptionTextProperty();
tprop->ItalicOn();
tprop->ShadowOn();
tprop->SetFontFamilyToTimes();
axes2->GetYAxisCaptionActor2D()->GetCaptionTextProperty()->ShallowCopy( tprop );
axes2->GetZAxisCaptionActor2D()->GetCaptionTextProperty()->ShallowCopy( tprop );
vtkPropAssembly* assembly = vtkPropAssembly::New();
assembly->AddPart( axes2 );
assembly->AddPart( cube );
vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
widget->SetOutlineColor( 0.9300, 0.5700, 0.1300 );
widget->SetOrientationMarker( assembly );
widget->SetInteractor( iren );
widget->SetViewport( 0.0, 0.0, 0.4, 0.4 );
widget->SetEnabled( 1 );
widget->InteractiveOff();
widget->InteractiveOn();
// Playback recorded events
//
//vtkInteractorEventRecorder *recorder = vtkInteractorEventRecorder::New();
//recorder->SetInteractor(iren);
//recorder->ReadFromInputStringOn();
//recorder->SetInputString( IOEventLog );
// Interact with data
// Render the image
//
iren->Initialize();
renWin->Render();
// Test SetKeyPressActivationValue for one of the widgets
//
//iren->SetKeyCode('z');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);
//iren->SetKeyCode('z');
//iren->InvokeEvent(vtkCommand::CharEvent,NULL);
//int retVal = vtkRegressionTestImage( renWin );
//
//if ( retVal == vtkRegressionTester::DO_INTERACTOR)
//{
//    iren->Start();
//}
// Clean up
//
//recorder->Off();
//recorder->Delete();
ipwProp->Delete();

```

```

orthoPlanes->Delete();
planeWidgetX->Delete();
planeWidgetY->Delete();
planeWidgetZ->Delete();
colorMap->Delete();
imageActor->Delete();
picker->Delete();
outlineActor->Delete();
outlineMapper->Delete();
outline->Delete();
iren->Delete();
renWin->Delete();
ren1->Delete();
ren2->Delete();
v16->Delete();
reader->Delete();
return 0;
}

```

## 12.157 gdcmmreslice.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderer.h"
#include "vtkAssembly.h"
#include "vtkImageFlip.h"
#include "vtkImageReslice.h"
#include "vtkRenderWindow.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkTransform.h"
#include "vtkAxesActor.h"
#include "vtkTextProperty.h"
#include "vtkCaptionActor2D.h"
#include "vtkPropAssembly.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkImageData.h"
#include "vtkLookupTable.h"
#include "vtkTexture.h"
#include "vtkPlaneSource.h"
#include "vtkVersion.h"
int main( int argc, char *argv[] )
{
    if( argc < 2 ) return 1;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( argv[1] );
    //reader->FileLowerLeftOn();
    reader->Update();
    vtkImageFlip *flip = vtkImageFlip::New();
    if (VTK_MAJOR_VERSION >= 6)
        flip->SetInputConnection( reader->GetOutputPort() );
    #else
        flip->SetInput( reader->GetOutput() );
    #endif
    flip->SetFilteredAxis(0);
    flip->Update();
    vtkImageReslice *reslice = vtkImageReslice::New();
    //reslice->SetInput( reader->GetOutput() );
    if (VTK_MAJOR_VERSION >= 6)
        reslice->SetInputConnection( flip->GetOutputPort() );
    #else
        reslice->SetInput( flip->GetOutput() );
    #endif
}

```

```

//reslice->SetResliceAxesDirectionCosines()
reader->GetDirectionCosines()->Print(std::cout);
vtkMatrix4x4 *invert = vtkMatrix4x4::New();
invert->DeepCopy( reader->GetDirectionCosines() );
invert->Invert();
//reslice->SetResliceAxes( reader->GetDirectionCosines() );
reslice->SetResliceAxes( invert );
reslice->Update();
vtkImageData* ima = reslice->GetOutput();
vtkLookupTable* table = vtkLookupTable::New();
table->SetNumberOfColors(1000);
table->SetTableRange(0,1000);
table->SetSaturationRange(0,0);
table->SetHueRange(0,1);
table->SetValueRange(0,1);
table->SetAlphaRange(1,1);
table->Build();
// Texture
vtkTexture* texture = vtkTexture::New();
#if (VTK_MAJOR_VERSION >= 6)
    texture->SetInputData(ima);
#else
    texture->SetInput(ima);
#endif
texture->InterpolateOn();
texture->SetLookupTable(table);
// PlaneSource
vtkPlaneSource* plane = vtkPlaneSource::New();
// PolyDataMapper
vtkPolyDataMapper *planeMapper = vtkPolyDataMapper::New();
#if (VTK_MAJOR_VERSION >= 6)
    planeMapper->SetInputConnection(plane->GetOutputPort());
#else
    planeMapper->SetInput(plane->GetOutput());
#endif
// Actor
vtkActor* planeActor = vtkActor::New();
planeActor->SetTexture(texture);
planeActor->SetMapper(planeMapper);
planeActor->PickableOn();
// Final rendering with simple interactor:
vtkRenderer *ren = vtkRenderer::New();
vtkRenderWindow *renwin = vtkRenderWindow::New();
renwin->AddRenderer(ren);
vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
iren->SetRenderWindow(renwin);
ren->AddActor(planeActor);
ren->SetBackground(0,0,0.5);
// DICOM is RAH:
vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
cube->SetXPlusFaceText ( "R" );
cube->SetXMinusFaceText ( "L" );
cube->SetYPlusFaceText ( "A" );
cube->SetYMinusFaceText ( "P" );
cube->SetZPlusFaceText ( "H" );
cube->SetZMinusFaceText ( "F" );
vtkAxesActor* axes2 = vtkAxesActor::New();
vtkTransform *transform = vtkTransform::New();
transform->Identity();
//reader->GetDirectionCosines()->Print(std::cout);
transform->Concatenate(invert);
//axes2->SetShaftTypeToCylinder();
axes2->SetUserTransform( transform );
cube->GetAssembly()->SetUserTransform( transform ); // cant get it to work
vtkPropAssembly* assembly = vtkPropAssembly::New();
assembly->AddPart( axes2 );
assembly->AddPart( cube );
vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
widget->SetOrientationMarker( assembly );
widget->SetInteractor( iren );
widget->SetEnabled( 1 );
widget->InteractiveOff();
widget->InteractiveOn();
renwin->Render();
iren->Start();
// Clean up:
reader->Delete();
table->Delete();
texture->Delete();
plane->Delete();
planeMapper->Delete();

```

```

planeActor->Delete();
ren->Delete();
renwin->Delete();
iren->Delete();
return 0;
}

```

## 12.158 gdcmrtionplan.cxx

```
/*=====
```

Program: GDCM (Grassroots DICOM). A DICOM library

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```
=====*/
```

```

#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkPolyData.h"
#include "vtkProperty.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkRenderer.h"
#include "vtkCellArray.h"
#include "vtkPoints.h"
#include "vtkDoubleArray.h"
#include <vtkXMLImageDataWriter.h>
#include <vtkXMLPolyDataWriter.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageColorViewer.h>
#include "vtkVersion.h"
#include "gdcmReader.h"
#include "gdcmAttribute.h"
/*

```

This example is just for fun. We found a RT Ion Plan Storage and simply extracted the viz stuff for VTK

```
RTIonPlanStorage, // 1.2.840.10008.5.1.4.1.1.481.8
```

```
*/
```

```
int main(int argc, char *argv[])
```

```
{
```

```
    if( argc < 3 )
```

```
    {
        std::cerr << argv[0] << " filename.dcm outfile.vti\n";
        return 1;
    }

```

```
    const char * filename = argv[1];
```

```
    const char * outfilename = argv[2];
```

```
    const char * outfilename2 = argv[3];
```

```
    gdcm::Reader reader;
```

```
    reader.SetFileName( filename );
```

```
    if( !reader.Read() )
```

```
    {
```

```
        return 1;
```

```
    }
```

```
    gdcm::MediaStorage ms;
```

```
    ms.SetFromFile( reader.GetFile() );
```

```
    if( ms != gdcm::MediaStorage::RTIonPlanStorage )
```

```
    {
```

```
        return 1;
```

```
    }
```

```
/*
```

```
(300a,03a2) SQ
```

```
# u/1,1 Ion Beam Sequence
```

```
(fffe,e000) na (Item with undefined length)
```

```
(0008,1040) LO [Test]
```

```
# 4,1 Institutional Department Name
```

```
(300a,00b2) SH (no value)
```

```
# 0,1 Treatment Machine Name
```

```
(300a,00b3) CS [MU]
```

```
# 2,1 Primary Dosimeter Unit
```

```
(300a,00c0) IS [1 ]
```

```
# 2,1 Beam Number
```

```
(300a,00c2) LO [1 ]
```

```
# 2,1 Beam Name
```

```
(300a,00c4) CS [STATIC]
```

```
# 6,1 Beam Type
```

```
(300a,00c6) CS [PROTON]
```

```
# 6,1 Radiation Type
```

```
(300a,00ce) CS [TREATMENT ]
```

```
# 10,1 Treatment Delivery Type
```



```

(300a,00d0) IS [ 0 ] # 2,1 Number of Wedges
(300a,00e0) IS [ 1 ] # 2,1 Number of Compensators
(300a,00ed) IS [ 0 ] # 2,1 Number of Boli
(300a,00f0) IS [ 1 ] # 2,1 Number of Blocks
(300a,0110) IS [ 2 ] # 2,1 Number of Control Points
(300a,02ea) SQ # u/l,1 Ion Range Compensator Sequence
(fffe,e000) na (Item with undefined length)
(300a,00e1) SH [lucite] # 6,1 Material ID
(300a,00e4) IS [ 1 ] # 2,1 Compensator Number
(300a,00e5) SH [75hdhe5 ] # 8,1 Compensator ID
(300a,00e7) IS [35] # 2,1 Compensator Rows
(300a,00e8) IS [37] # 2,1 Compensator Columns
(300a,00e9) DS [3.679991\4.249288 ] # 18,2 Compensator Pixel Spacing
(300a,00ea) DS [-76.00\62.50] # 12,2 Compensator Position
(300a,00ec) DS
    [52.13\52.13\52.13\53.18\54.04\54.04\47.11\40.06\40.06\38.79\34.87\33.28\33.28\33.28\33.28\35.43\35.43\34.54\34.54\34.71\36.
    # 7618,1-n Compensator Thickness Data
(300a,02e0) CS [ABSENT] # 6,1 Compensator Divergence
(300a,02e1) CS [SOURCE_SIDE ] # 12,1 Compensator Mounting Position
(300a,02e4) FL 39.2 # 4,1 Isocenter to Compensator Tray Distance
(300a,02e5) FL 2.12 # 4,1 Compensator Column Offset
(300a,02e8) FL 4.76 # 4,1 Compensator Milling Tool Diameter
(fffe,e00d)
*/
const gdcmm::DataSet& ds = reader.GetFile().GetDataSet();
gdcmm::Tag tbeamsq(0x300a,0x03a2);
if( !ds.FindDataElement( tbeamsq ) )
{
    return 1;
}
const gdcmm::DataElement &tbeamsq = ds.GetDataElement( tbeamsq );
//std::cout << beamsq << std::endl;
gdcmm::SmartPointer<gdcmm::SequenceOfItems> sqi = beamsq.GetValueAsSQ();
if( !sqi || !sqi->GetNumberOfItems() )
{
    return 1;
}
//for(unsigned int pd = 0; pd < sqi->GetNumberOfItems(); ++pd)
// {
//const gdcmm::Item & item = sqi->GetItem(1); // Item start at #1
const gdcmm::Item & item = sqi->GetItem(1); // Item start at #1
const gdcmm::DataSet& nestedds = item.GetNestedDataSet();
//std::cout << nestedds << std::endl;
gdcmm::Tag tcompensatorsq(0x300a,0x02ea);
if( !nestedds.FindDataElement( tcompensatorsq ) )
{
    return 1;
}
const gdcmm::DataElement &tcompensatorsq = nestedds.GetDataElement( tcompensatorsq );
//std::cout << compensatorsq << std::endl;
gdcmm::SmartPointer<gdcmm::SequenceOfItems> ssqi = compensatorsq.GetValueAsSQ();
const gdcmm::Item & item2 = ssqi->GetItem(1); // Item start at #1
const gdcmm::DataSet& nestedds2 = item2.GetNestedDataSet();
//std::cout << nestedds2 << std::endl;
gdcmm::Tag tcompensatorthicknessdata(0x300a,0x00ec);
if( !nestedds2.FindDataElement( tcompensatorthicknessdata ) )
{
    return 1;
}
const gdcmm::DataElement &tcompensatorthicknessdata = nestedds2.GetDataElement( tcompensatorthicknessdata );
// std::cout << compensatorthicknessdata << std::endl;
gdcmm::Attribute<0x300a,0x00ec> at;
at.SetFromDataElement( compensatorthicknessdata );
const double* pts = at.GetValues();
// (300a,00e7) IS [35] # 2,1 Compensator Rows
gdcmm::Attribute<0x300a,0x00e7> at1;
const gdcmm::DataElement &tcompensatorrows = nestedds2.GetDataElement( at1.GetTag() );
at1.SetFromDataElement( compensatorrows );
std::cout << at1.GetValue() << std::endl;
// (300a,00e8) IS [37] # 2,1 Compensator Columns
gdcmm::Attribute<0x300a,0x00e8> at2;
const gdcmm::DataElement &tcompensatorcols = nestedds2.GetDataElement( at2.GetTag() );
at2.SetFromDataElement( compensatorcols );
std::cout << at2.GetValue() << std::endl;
// (300a,00e9) DS [3.679991\4.249288 ] # 18,2 Compensator Pixel Spacing
gdcmm::Attribute<0x300a,0x00e9> at3;
const gdcmm::DataElement &tcompensatorpixelspacing = nestedds2.GetDataElement( at3.GetTag() );
at3.SetFromDataElement( compensatorpixelspacing );
std::cout << at3.GetValue(0) << std::endl;
// (300a,00ea) DS [-76.00\62.50] # 12,2 Compensator Position
gdcmm::Attribute<0x300a,0x00ea> at4;

```

```

const gdcm::DataElement &compensatorposition = nestedds2.GetDataElement( at4.GetTag() );
at4.SetFromDataElement( compensatorposition );
std::cout << at4.GetValue(0) << std::endl;
vtkDoubleArray *d = vtkDoubleArray::New();
d->SetArray( const_cast<double*>(pts) , at1.GetValue() * at2.GetValue() , 0 );
vtkImageData *img = vtkImageData::New();
img->Initialize();
img->SetDimensions( at2.GetValue(), at1.GetValue(), 1 );
//imgb->SetExtent(1, xdim, 1, ydim, 1, zdim);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetScalarTypeToDouble();
#endif
img->SetSpacing( at3.GetValue(1), at3.GetValue(0), 1); // FIXME image is upside down
img->SetOrigin( at4.GetValue(0), at4.GetValue(1), 1);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetNumberOfScalarComponents(1);
#endif
img->GetPointData()->SetScalars(d);
#if (VTK_MAJOR_VERSION >= 6)
#else
    img->Update();
#endif
img->Print(std::cout);
vtkXMLImageDataWriter *writeb= vtkXMLImageDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writeb->SetInputData( img );
#else
    writeb->SetInput( img );
#endif
writeb->SetFileName( outfilename );
writeb->Write();

/*
(300a,03a6) SQ # u/1,1 Ion Block Sequence
(fffe,e000) na (Item with undefined length)
(300a,00e1) SH [brass ] # 6,1 Material ID
(300a,00f7) FL 95.03 # 4,1 Isocenter to Block Tray Distance
(300a,00f8) CS [APERTURE] # 8,1 Block Type
(300a,00fa) CS [ABSENT] # 6,1 Block Divergence
(300a,00fb) CS [SOURCE_SIDE ] # 12,1 Block Mounting Position
(300a,00fc) IS [1 ] # 2,1 Block Number
(300a,0100) DS [50.00 ] # 6,1 Block Thickness
(300a,0104) IS [179 ] # 4,1 Block Number of Points
(300a,0106) DS
[1.7\50.0\14.3\50.0\16.7\49.4\18.7\48.2\19.4\47.7\20.1\47.1\21.0\47.0\22.3\47.0\23.7\46.8\25.7\46.2\27.0\45.6\27.2\45.4\28.2
2\37.4\43.0\37.1\44.7\36] # 1934,2-2n Block Data
(fffe,e00d)
(fffe,e0dd)

*/
gdcm::Tag tblocksq(0x300a,0x03a6);
if( !nestedds.FindDataElement( tblocksq ) )
{
    return 1;
}
const gdcm::DataElement &blocksq = nestedds.GetDataElement( tblocksq );
//std::cout << blocksq << std::endl;
gdcm::SmartPointer<gdcm::SequenceOfItems> sssqi = blocksq.GetValueAssSQ();
const gdcm::Item & item3 = sssqi->GetItem(1); // Item start at #1
const gdcm::DataSet& nestedds3 = item3.GetNestedDataSet();
gdcm::Tag tblockdata(0x300a,0x0106);
if( !nestedds3.FindDataElement( tblockdata ) )
{
    return 1;
}
const gdcm::DataElement &blockdata = nestedds3.GetDataElement( tblockdata );
// std::cout << blockdata << std::endl;
gdcm::Attribute<0x300a,0x0106> at_;
at_.SetFromDataElement( blockdata );
vtkDoubleArray *scalars = vtkDoubleArray::New();
scalars->SetNumberOfComponents(3);
gdcm::Attribute<0x300a,0x0104> bnpts; // IS [179 ] # 4,1 Block Number
of Points
if( !nestedds3.FindDataElement( bnpts.GetTag() ) )
{
    return 1;
}
const gdcm::DataElement &blocknpts = nestedds3.GetDataElement( bnpts.GetTag() );

```

```

bnpts.SetFromDataElement( blocknpts );
//std::cout << bnpts.GetValue() << std::endl;
vtkPolyData *output = vtkPolyData::New();
vtkPoints *newPts = vtkPoints::New();
vtkCellArray *polys = vtkCellArray::New();
const double *ptr = at_.GetValues();
//unsigned int npts = bnpts.GetNumberOfValues() / 2;
unsigned int npts = bnpts.GetValue();
vtkIdType *ptIds = new vtkIdType[npts];
for(unsigned int i = 0; i < npts; ++i)
{
    float x[3] = {};
    x[0] = (float)ptr[2*i+0];
    x[1] = (float)ptr[2*i+1];
    //x[2] = pts[i+2];
    vtkIdType ptId = newPts->InsertNextPoint( x );
    //std::cout << x[0] << "," << x[1] << "," << x[2] << std::endl;
    ptIds[i] = ptId;
}
vtkIdType cellId = polys->InsertNextCell(npts, ptIds);
(void)cellId;
delete[] ptIds;
output->SetPoints(newPts);
newPts->Delete();
output->SetPolys(polys);
polys->Delete();
//output->GetCellData()->SetScalars(scalars);
//scalars->Delete();
#if (VTK_MAJOR_VERSION >= 6)
#else
    output->Update();
#endif
    output->Print( std::cout );
    // }
    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    vtkImageColorViewer *viewer = vtkImageColorViewer::New();
#if (VTK_MAJOR_VERSION >= 6)
    viewer->SetInputData(img);
#else
    viewer->SetInput(img);
#endif
    viewer->SetupInteractor(iren);
    viewer->SetSize(600, 600);
    viewer->GetRenderer()->ResetCameraClippingRange();
    viewer->Render();
    viewer->GetRenderer()->ResetCameraClippingRange();
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
#if (VTK_MAJOR_VERSION >= 6)
    cubeMapper->SetInputData( output );
#else
    cubeMapper->SetInput( output );
#endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    //vtkActor2D* cubeActor = vtkActor2D::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty *property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();
    viewer->GetRenderer()->AddActor( cubeActor );
    vtkXMLPolyDataWriter *writec = vtkXMLPolyDataWriter::New();
    #if (VTK_MAJOR_VERSION >= 6)
    writec->SetInputData( output );
    #else
    writec->SetInput( output );
    #endif
    writec->SetFileName( outfilename2 );
    writec->Write();
    iren->Initialize();
    iren->Start();
    return 0;
}

```

## 12.159 gdcmrtpplan.cxx

```
/*=====
```

Program: GDCM (Grassroots DICOM). A DICOM library

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```

=====*/
#include "vtkImageData.h"
#include "vtkPointData.h"
#include "vtkPolyData.h"
#include "vtkProperty.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkRenderer.h"
#include "vtkCellArray.h"
#include "vtkPoints.h"
#include "vtkDoubleArray.h"
#include <vtkXMLImageDataWriter.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageColorViewer.h>
#include "vtkVersion.h"
#include "gdcmReader.h"
#include "gdcmAttribute.h"
/*
This example is just for fun. We found a fake RT Ion Plan Storage and simply extracted the viz stuff for VTK
but this is rather a RT Plan storage
*/
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " filename.dcm outfile.vti\n";
        return 1;
    }
    const char * filename = argv[1];
    const char * outfilename = argv[2];
    gdcm::Reader reader;
    reader.SetFileName( filename );
    if( !reader.Read() )
    {
        return 1;
    }
    gdcm::MediaStorage ms;
    ms.SetFromFile( reader.GetFile() );
    if( ms != gdcm::MediaStorage::RTIonPlanStorage )
    {
        return 1;
    }
    /*
(300a,00b0) SQ                                     # u/1,1 Beam Sequence
(fffe,e000) na (Item with undefined length)
(300a,00b2) SH (no value)                         # 0,1 Treatment Machine Name
(300a,00c0) IS [1 ]                               # 2,1 Beam Number
(300a,00c2) LO [1 ]                               # 2,1 Beam Name
(300a,00c4) CS [STATIC]                           # 6,1 Beam Type
(300a,00c6) CS [PROTON]                           # 6,1 Radiation Type
(300a,00ce) CS [TREATMENT ]                       # 10,1 Treatment Delivery Type
(300a,00e0) IS [1 ]                               # 2,1 Number of Compensators
(300a,00e3) SQ                                     # u/1,1 Compensator Sequence
(fffe,e000) na (Item with undefined length)
(300a,00e1) SH [lucite]                            # 6,1 Material ID
(300a,00e4) IS [1 ]                               # 2,1 Compensator Number
(300a,00e5) SH [75hdhe5 ]                         # 8,1 Compensator ID
(300a,00e7) IS [35]                               # 2,1 Compensator Rows
(300a,00e8) IS [37]                               # 2,1 Compensator Columns
(300a,00e9) DS [3.679991\4.249288 ]               # 18,2 Compensator Pixel Spacing
(300a,00ea) DS [-76.00\62.50]                     # 12,2 Compensator Position
(300a,00ec) DS                                     # 6,1 Compensator Divergence
[52.13\52.13\52.13\53.18\54.04\54.04\47.11\40.06\40.06\38.79\34.87\33.28\33.28\33.28\33.28\35.43\35.43\34.54\34.54\34.71\36.
# 7618,1-n Compensator Thickness Data
(300a,02e0) CS [ABSENT]                           # 12,1 Compensator Mounting Position
(300a,02e1) CS [SOURCE_SIDE ]
(fffe,e00d)
(fffe,e000) na (Item with undefined length)
(fffe,e00d)
(fffe,e0dd)
*/

```

```

const gdcm::DataSet& ds = reader.GetFile().GetDataSet();
gdcm::Tag tbeamsq(0x300a,0x00b0);
if( !ds.FindDataElement( tbeamsq ) )
{
    return 1;
}
const gdcm::DataElement &tbeamsq = ds.GetDataElement( tbeamsq );
//std::cout << beamsq << std::endl;
gdcm::SmartPointer<gdcm::SequenceOfItems> sqi = beamsq.GetValueAsSQ();
if( !sqi || !sqi->GetNumberOfItems() )
{
    return 1;
}
//for(unsigned int pd = 0; pd < sqi->GetNumberOfItems(); ++pd)
// {
//const gdcm::Item & item = sqi->GetItem(1); // Item start at #1
const gdcm::Item & item = sqi->GetItem(2); // Item start at #1
const gdcm::DataSet& nestedds = item.GetNestedDataSet();
//std::cout << nestedds << std::endl;
gdcm::Tag tcompensatorsq(0x300a,0x00e3);
if( !nestedds.FindDataElement( tcompensatorsq ) )
{
    return 1;
}
const gdcm::DataElement &tcompensatorsq = nestedds.GetDataElement( tcompensatorsq );
//std::cout << compensatorsq << std::endl;
gdcm::SmartPointer<gdcm::SequenceOfItems> ssqi = compensatorsq.GetValueAsSQ();
const gdcm::Item & item2 = ssqi->GetItem(1); // Item start at #1
const gdcm::DataSet& nestedds2 = item2.GetNestedDataSet();
//std::cout << nestedds2 << std::endl;
gdcm::Tag tcompensatorthicknessdata(0x300a,0x00ec);
if( !nestedds2.FindDataElement( tcompensatorthicknessdata ) )
{
    return 1;
}
const gdcm::DataElement &tcompensatorthicknessdata = nestedds2.GetDataElement( tcompensatorthicknessdata );
// std::cout << compensatorthicknessdata << std::endl;
gdcm::Attribute<0x300a,0x00ec> at;
at.SetFromDataElement( compensatorthicknessdata );
const double* pts = at.GetValues();
// (300a,00e7) IS [35] # 2,1 Compensator Rows
gdcm::Attribute<0x300a,0x00e7> at1;
const gdcm::DataElement &compensatorrows = nestedds2.GetDataElement( at1.GetTag() );
at1.SetFromDataElement( compensatorrows );
std::cout << at1.GetValue() << std::endl;
// (300a,00e8) IS [37] # 2,1 Compensator Columns
gdcm::Attribute<0x300a,0x00e8> at2;
const gdcm::DataElement &compensatorcols = nestedds2.GetDataElement( at2.GetTag() );
at2.SetFromDataElement( compensatorcols );
std::cout << at2.GetValue() << std::endl;
// (300a,00e9) DS [3.679991\4.249288 ] # 18,2 Compensator Pixel Spacing
gdcm::Attribute<0x300a,0x00e9> at3;
const gdcm::DataElement &compensatorpixelspacing = nestedds2.GetDataElement( at3.GetTag() );
at3.SetFromDataElement( compensatorpixelspacing );
std::cout << at3.GetValue(0) << std::endl;
// (300a,00ea) DS [-76.00\62.50] # 12,2 Compensator Position
gdcm::Attribute<0x300a,0x00ea> at4;
const gdcm::DataElement &compensatorposition = nestedds2.GetDataElement( at4.GetTag() );
at4.SetFromDataElement( compensatorposition );
std::cout << at4.GetValue(0) << std::endl;
vtkDoubleArray *d = vtkDoubleArray::New();
d->SetArray( const_cast<double*>(pts) , at1.GetValue() * at2.GetValue() , 0 );
vtkImageData *img = vtkImageData::New();
img->Initialize();
img->SetDimensions( at2.GetValue(), at1.GetValue(), 1 );
//imgb->SetExtent(1, xdim, 1, ydim, 1, zdim);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetScalarTypeToDouble();
#endif
img->SetSpacing( at3.GetValue(1), at3.GetValue(0), 1); // FIXME image is upside down
img->SetOrigin( at4.GetValue(0), at4.GetValue(1), 1);
#if (VTK_MAJOR_VERSION >= 6)
    assert(0);
#else
    img->SetNumberOfScalarComponents(1);
#endif
img->GetPointData()->SetScalars(d);
vtkXMLImageDataWriter *writeb= vtkXMLImageDataWriter::New();
#if (VTK_MAJOR_VERSION >= 6)

```

```

        writeb->SetInputData( img );
    #else
        writeb->SetInput( img );
    #endif
        writeb->SetFileName( outfilename );
        writeb->Write( );
    /*
    (300a,00f4) SQ                                     # u/1,1 Block Sequence
    (fffe,e000) na (Item with undefined length)
    (300a,00e1) SH [brass ]                             # 6,1 Material ID
    (300a,00f8) CS [APERTURE]                           # 8,1 Block Type
    (300a,00fa) CS [ABSENT]                             # 6,1 Block Divergence
    (300a,00fb) CS [SOURCE_SIDE ]                       # 12,1 Block Mounting Position
    (300a,00fc) IS [1 ]                                 # 2,1 Block Number
    (300a,0100) DS [50.00 ]                             # 6,1 Block Thickness
    (300a,0104) IS [179 ]                               # 4,1 Block Number of Points
    (300a,0106) DS
        [1.7\50.0\14.3\50.0\16.7\49.4\18.7\48.2\19.4\47.7\20.1\47.1\21.0\47.0\22.3\47.0\23.7\46.8\25.7\46.2\27.0\45.6\27.2\45.4\28.2]
        # 1934,2-2n Block Data
    (fffe,e00d)
    (fffe,e000) na (Item with undefined length)
    (fffe,e00d)
    (fffe,e0dd)
    */
    gdcm::Tag tblocksq(0x300a,0x00f4);
    if( !nestedds.FindDataElement( tblocksq ) )
    {
        return 1;
    }
    const gdcm::DataElement &blocksq = nestedds.GetDataElement( tblocksq );
    //std::cout << blocksq << std::endl;
    gdcm::SmartPointer<gdcm::SequenceOfItems> sssqi = blocksq.GetValueAsSQ();
    const gdcm::Item & item3 = sssqi->GetItem(1); // Item start at #1
    const gdcm::DataSet& nestedds3 = item3.GetNestedDataSet();
    gdcm::Tag tblockdata(0x300a,0x0106);
    if( !nestedds3.FindDataElement( tblockdata ) )
    {
        return 1;
    }
    const gdcm::DataElement &tblockdata = nestedds3.GetDataElement( tblockdata );
    // std::cout << tblockdata << std::endl;
    gdcm::Attribute<0x300a,0x0106> at_;
    at_.SetFromDataElement( tblockdata );
    vtkDoubleArray *scalars = vtkDoubleArray::New();
    scalars->SetNumberOfComponents(3);
    gdcm::Attribute<0x300a,0x0104> bnpts; // IS [179 ] # 4,1 Block Number of Points
    if( !nestedds3.FindDataElement( bnpts.GetTag() ) )
    {
        return 1;
    }
    const gdcm::DataElement &tbnpts = nestedds3.GetDataElement( bnpts.GetTag() );
    bnpts.SetFromDataElement( tbnpts );
    std::cout << bnpts.GetValue() << std::endl;
    vtkPolyData *output = vtkPolyData::New();
    vtkPoints *newPts = vtkPoints::New();
    vtkCellArray *polys = vtkCellArray::New();
    const double *ptr = at_.GetValues();
    //unsigned int npts = bnpts.GetNumberOfValues() / 2;
    unsigned int npts = bnpts.GetValue();
    vtkIdType *ptIds = new vtkIdType[npts];
    for(unsigned int i = 0; i < npts; ++i)
    {
        float x[3] = {};
        x[0] = (float)ptr[2*i+0];
        x[1] = (float)ptr[2*i+1];
        //x[2] = ptr[i+2];
        vtkIdType ptId = newPts->InsertNextPoint( x );
        //std::cout << x[0] << " " << x[1] << " " << x[2] << std::endl;
        ptIds[i] = ptId;
    }
    vtkIdType cellId = polys->InsertNextCell(npts , ptIds);
    (void)cellId;
    delete[] ptIds;
    output->SetPoints(newPts);
    newPts->Delete();
    output->SetPolys(polys);
    polys->Delete();
    //output->GetCellData()->SetScalars(scalars);
    //scalars->Delete();
    #if VTK_MAJOR_VERSION >= 6
    #else

```

```

        output->Update();
#endif
        output->Print( std::cout );
        // }
        vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
        vtkImageColorViewer *viewer = vtkImageColorViewer::New();
#if (VTK_MAJOR_VERSION >= 6)
        viewer->SetInputData(img);
#else
        viewer->SetInput(img);
#endif
        viewer->SetupInteractor(iren);
        viewer->SetSize(600, 600);
        viewer->Render();
        vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
        //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
#if (VTK_MAJOR_VERSION >= 6)
        cubeMapper->SetInputData( output );
#else
        cubeMapper->SetInput( output );
#endif
        cubeMapper->SetScalarRange(0,7);
        vtkActor *cubeActor = vtkActor::New();
        //vtkActor2D* cubeActor = vtkActor2D::New();
        cubeActor->SetMapper(cubeMapper);
        vtkProperty * property = cubeActor->GetProperty();
        property->SetRepresentationToWireframe();
        viewer->GetRenderer()->AddActor( cubeActor );
        iren->Initialize();
        iren->Start();
        return 0;
}

```

## 12.160 gdcmscene.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkGDCMPolyDataReader.h"
// #include "vtkGDCMPolyDataWriter.h"
#include "vtkAppendPolyData.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkVersion.h"
// gdcmDataExtra/gdcmNonImageData/exRT_Structure_Set_Storage.dcm
// gdcmDataExtra/gdcmNonImageData/RTSTRUCT_1.3.6.1.4.1.22213.1.1396.2.dcm
// gdcmDataExtra/gdcmNonImageData/RT/RTStruct.dcm
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " filename1.dcm\n";
        return 1;
    }
    const char * filename = argv[1];
    vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
    reader->SetFileName( filename );
    reader->Update();
    // vtkGDCMPolyDataWriter * writer2 = vtkGDCMPolyDataWriter::New();

```

```

// for(int num = 0; num < reader->GetNumberOfOutputPorts(); ++num )
//     writer2->SetInput( num, reader->GetOutput(num) );
// writer2->SetFileName( "rtstruct.dcm" );
// writer2->Write();
// print reader output:
reader->Print( std::cout );
// print first output:
reader->GetOutput()->Print( std::cout );
vtkAppendPolyData *append = vtkAppendPolyData::New();
int n = reader->GetNumberOfOutputPorts();
for(int i = 0; i < n; ++i)
{
#ifdef (VTK_MAJOR_VERSION >= 6)
    append->AddInputConnection( reader->GetOutputPort(i) );
#else
    append->AddInput( reader->GetOutput(i) );
#endif
    vtkPolyDataWriter * writer = vtkPolyDataWriter::New();
#ifdef (VTK_MAJOR_VERSION >= 6)
    writer->SetInputConnection( reader->GetOutputPort() );
#else
    writer->SetInput( reader->GetOutput() );
#endif
    writer->SetFileName( "rtstruct.vtk" );
    //writer->Write();
    // Now we'll look at it.
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    //vtkPolyDataMapper2D* cubeMapper = vtkPolyDataMapper2D::New();
    //cubeMapper->SetInput( reader->GetOutput() );
#ifdef (VTK_MAJOR_VERSION >= 6)
    cubeMapper->SetInputConnection( append->GetOutputPort() );
#else
    cubeMapper->SetInput( append->GetOutput() );
#endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    //vtkActor2D* cubeActor = vtkActor2D::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty * property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();
    //cubeActor->GetProperty()->SetColor(1, 0, 0);
    // The usual rendering stuff.
    // vtkCamera *camera = vtkCamera::New();
    //     camera->SetPosition(1,1,1);
    //     camera->SetFocalPoint(0,0,0);
    vtkRenderer *renderer = vtkRenderer::New();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->AddRenderer(renderer);
    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
    renderer->AddActor(cubeActor);
    //renderer->AddActor2D(cubeActor);
    //renderer->SetActiveCamera(camera);
    renderer->ResetCamera();
    renderer->SetBackground(1,1,1);
    renWin->SetSize(300,300);
    // interact with data
    renWin->Render();
    iren->Start();
    reader->Delete();
    append->Delete();
    cubeMapper->Delete();
    cubeActor->Delete();
    // camera->Delete();
    renderer->Delete();
    renWin->Delete();
    iren->Delete();
    writer->Delete();
    return 0;
}

```

## 12.161 gdcmttexture.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

```



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```

=====*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderer.h"
#include "vtkAssembly.h"
#include "vtkRenderWindow.h"
#include "vtkAnnotatedCubeActor.h"
#include "vtkTransform.h"
#include "vtkAxesActor.h"
#include "vtkTextProperty.h"
#include "vtkCaptionActor2D.h"
#include "vtkPropAssembly.h"
#include "vtkOrientationMarkerWidget.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkPolyDataMapper.h"
#include "vtkActor.h"
#include "vtkImageData.h"
#include "vtkLookupTable.h"
#include "vtkTexture.h"
#include "vtkPlaneSource.h"
#include "vtkVersion.h"
int main( int argc, char *argv[] )
{
    if( argc < 2 ) return 1;
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( argv[1] );
    reader->Update();
    vtkImageData* ima = reader->GetOutput();
    vtkLookupTable* table = vtkLookupTable::New();
    table->SetNumberOfColors(1000);
    table->SetTableRange(0,1000);
    table->SetSaturationRange(0,0);
    table->SetHueRange(0,1);
    table->SetValueRange(0,1);
    table->SetAlphaRange(1,1);
    table->Build();
    // Texture
    vtkTexture* texture = vtkTexture::New();
    #if (VTK_MAJOR_VERSION >= 6)
        texture->SetInputData(ima);
    #else
        texture->SetInput(ima);
    #endif
    texture->InterpolateOn();
    texture->SetLookupTable(table);
    // PlaneSource
    vtkPlaneSource* plane = vtkPlaneSource::New();
    plane->SetOrigin( -0.5, -0.5, 0.0);
    plane->SetPoint1( 0.5, -0.5, 0.0);
    plane->SetPoint2( -0.5, 0.5, 0.0);
    // PolyDataMapper
    vtkPolyDataMapper *planeMapper = vtkPolyDataMapper::New();
    #if (VTK_MAJOR_VERSION >= 6)
        planeMapper->SetInputConnection(plane->GetOutputPort());
    #else
        planeMapper->SetInput(plane->GetOutput());
    #endif
    // Actor
    vtkActor* planeActor = vtkActor::New();
    planeActor->SetTexture(texture);
    planeActor->SetMapper(planeMapper);
    planeActor->PickableOn();
    // Final rendering with simple interactor:
    vtkRenderer *ren = vtkRenderer::New();
    vtkRenderWindow *renwin = vtkRenderWindow::New();
    renwin->AddRenderer(ren);
    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renwin);
    ren->AddActor(planeActor);
    ren->SetBackground(0,0,0.5);
    vtkAnnotatedCubeActor* cube = vtkAnnotatedCubeActor::New();
    cube->SetXPlusFaceText( "L" );
    cube->SetXMinusFaceText( "R" );

```

```

cube->SetYPlusFaceText ( "A" );
cube->SetYMinusFaceText ( "P" );
cube->SetZPlusFaceText ( "H" );
cube->SetZMinusFaceText ( "F" );
vtkAxesActor* axes2 = vtkAxesActor::New();
// simulate a left-handed coordinate system
//
vtkTransform *transform = vtkTransform::New();
transform->Identity();
//transform->RotateY(180);
reader->GetDirectionCosines()->Print(std::cout);
transform->Concatenate(reader->GetDirectionCosines());
//axes2->SetShaftTypeToCylinder();
axes2->SetUserTransform( transform );
//cube->SetUserTransform( transform ); // cant get it to work
cube->GetAssembly()->SetUserTransform( transform ); // cant get it to work
vtkPropAssembly* assembly = vtkPropAssembly::New();
assembly->AddPart( axes2 );
assembly->AddPart( cube );
vtkOrientationMarkerWidget* widget = vtkOrientationMarkerWidget::New();
//widget->SetOutlineColor( 0.9300, 0.5700, 0.1300 );
widget->SetOrientationMarker( assembly );
widget->SetInteractor( iren );
//widget->SetViewport( 0.0, 0.0, 0.4, 0.4 );
widget->SetEnabled( 1 );
widget->InteractiveOff();
widget->InteractiveOn();
renwin->Render();
iren->Start();
// Clean up:
reader->Delete();
table->Delete();
texture->Delete();
plane->Delete();
planeMapper->Delete();
planeActor->Delete();
ren->Delete();
renwin->Delete();
iren->Delete();
return 0;
}

```

## 12.162 gdcmvolume.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
#include "vtkVersion.h"
#include "vtkGDCMImageReader.h"
#include "vtkPiecewiseFunction.h"
#include "vtkColorTransferFunction.h"
#include "vtkVolume.h"
#include "vtkVolumeProperty.h"
#if VTK_MAJOR_VERSION < 7
#include "vtkVolumeTextureMapper3D.h"
#endif
#include "vtkFixedPointVolumeRayCastMapper.h"
#include "vtkInteractorStyleTrackballCamera.h"
#include "vtkRenderer.h"
#include "vtkRenderWindow.h"
#include "vtkImageClip.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkVersion.h"
// gdcmvolume gdcmData/GE_DLX-8-MONO2-Multiframe-Jpeg_Lossless.dcm
int main(int argc, char *argv[])
{
    if( argc < 2 ) return 1;

```

```

vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
reader->SetFileName( argv[1] );
reader->Update();
// Create the renderers, render window, and interactor
vtkRenderWindow *renWin = vtkRenderWindow::New();
vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
iren->SetRenderWindow(renWin);
vtkRenderer *ren = vtkRenderer::New();
renWin->AddRenderer(ren);
// Create a transfer function mapping scalar value to opacity
vtkPiecewiseFunction *oTFun = vtkPiecewiseFunction::New();
//oTFun->AddSegment(0, 1.0, 256, 0.1);
oTFun->AddSegment(0, 1.0, 240, 0.1);
vtkColorTransferFunction *cTFun = vtkColorTransferFunction::New();
cTFun->AddRGBPoint( 0, 1.0, 1.0, 1.0 );
//cTFun->AddRGBPoint( 255, 1.0, 1.0, 1.0 );
cTFun->AddRGBPoint( 240, 1.0, 1.0, 1.0 );
// Need to crop to actually see minimum intensity
vtkImageClip *clip = vtkImageClip::New();
clip->SetInputConnection( reader->GetOutputPort() );
clip->SetOutputWholeExtent(0,66,0,66,30,37);
clip->ClipDataOn();
vtkVolumeProperty *property = vtkVolumeProperty::New();
property->SetScalarOpacity(oTFun);
property->SetColor(cTFun);
property->SetInterpolationTypeToLinear();
vtkFixedPointVolumeRayCastMapper *mapper = vtkFixedPointVolumeRayCastMapper::New();
mapper->SetBlendModeToMinimumIntensity();
mapper->SetInputConnection( reader->GetOutputPort() );
vtkVolume *volume = vtkVolume::New();
volume->SetMapper(mapper);
volume->SetProperty(property);
ren->AddViewProp(volume);
renWin->Render();
{
    iren->Start();
}
volume->Delete();
mapper->Delete();
property->Delete();
clip->Delete();
cTFun->Delete();
oTFun->Delete();
reader->Delete();
renWin->Delete();
iren->Delete();
ren->Delete();
return 0;
}

```

## 12.163 offscreenimage.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
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=====*/
#include "vtkGDCMImageReader.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkImageMapToWindowLevelColors.h"
#include "vtkImageActor.h"
#include "vtkPNGWriter.h"
#include "vtkWindowToImageFilter.h"
#include "vtkMedicalImageProperties.h"
#include "vtkVersion.h"
int main(int argc, char *argv[])
{
    if( argc < 2 )

```

```

    {
        return 1;
    }
    const char *filename = argv[1];
    vtkGDCMImageReader *reader = vtkGDCMImageReader::New();
    reader->SetFileName( filename );
    reader->Update(); // important to read the window/level info
    vtkMedicalImageProperties *prop = reader->GetMedicalImageProperties();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->OffScreenRenderingOn();
    vtkRenderer *renderer = vtkRenderer::New();
    renWin->AddRenderer(renderer);
    vtkImageMapToWindowLevelColors *windowlevel = vtkImageMapToWindowLevelColors::New();
    #if (VTK_MAJOR_VERSION >= 6)
        windowlevel->SetInputConnection( reader->GetOutputPort() );
    #else
        windowlevel->SetInput( reader->GetOutput() );
    #endif
    unsigned int n = prop->GetNumberOfWindowLevelPresets();
    if( n )
    {
        // Take the first one by default:
        const double *wl = prop->GetNthWindowLevelPreset(0);
        windowlevel->SetWindow( wl[0] );
        windowlevel->SetLevel( wl[1] );
    }
    vtkImageActor *actor = vtkImageActor::New();
    #if (VTK_MAJOR_VERSION >= 6)
        actor->SetInputData( windowlevel->GetOutput() );
    #else
        actor->SetInput( windowlevel->GetOutput() );
    #endif
    renderer->AddActor( actor );
    renWin->Render();
    vtkWindowToImageFilter *w2if = vtkWindowToImageFilter::New();
    w2if->SetInput ( renWin );
    vtkPNGWriter *wr = vtkPNGWriter::New();
    #if (VTK_MAJOR_VERSION >= 6)
        wr->SetInputConnection( w2if->GetOutputPort() );
    #else
        wr->SetInput( w2if->GetOutput() );
    #endif
    wr->SetFileName ( "offscreenimage.png" );
    wr->Write();
    reader->Delete();
    renWin->Delete();
    renderer->Delete();
    windowlevel->Delete();
    actor->Delete();
    w2if->Delete();
    wr->Delete();
    return 0;
}

```

## 12.164 reslicesphere.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
//
// Load a DICOM series.
// Position a sphere within the volume.
// Allow the user to change between Axial, Sagittal, Coronal, and
// Oblique view of the images and move through the slices.
// The display should show the resliced image and the cross section
// of the sphere intersecting that plane.
//

```

```

/*
from Scott Johnson /Scott Johnson neuwave com/
to VTK /vtkusers vtk.org/
date Tue, May 11, 2010 at 7:01 PM
*/
#include <string>
#include <vtkDICOMImageReader.h>
#include <vtkStringArray.h>
#include <vtkDirectory.h>
#include <vtkImageThreshold.h>
#include <vtkImageShiftScale.h>
#include <vtkImageReslice.h>
#include <vtkRenderWindowInteractor.h>
#include <vtkImageViewer2.h>
#include <vtkSphereSource.h>
#include <vtkPolyDataMapper.h>
#include <vtkPlane.h>
#include <vtkCutter.h>
#include <vtkActor.h>
#include <vtkCommand.h>
#include <vtkSmartPointer.h>
#include <vtkMatrix4x4.h>
#include <vtkInteractorObserver.h>
#include <vtkProperty.h>
#include <vtkRenderer.h>
#include <vtkImageData.h>
#include <vtkImageActor.h>
#include "vtkTransformPolyDataFilter.h"
#include <vtkCamera.h>
#include <vtkMath.h>
#include <vtkTransform.h>
#include <vtkTextActor.h>
#include <vtkActor2D.h>
#include <vtkPolyDataMapper2D.h>
#include <vtkProperty2D.h>
#include <vtkGDCMImageReader.h>
#include <vtkImageChangeInformation.h>
#include <vtkVersion.h>
#include "gdcmDirectory.h"
#include "gdcmTesting.h"
#include "gdcmIPPSorter.h"
// Change to match the path to find Raw_0.vti or provide
// the parameter when starting ResliceSphere.
const double sphereCenter[3]={74, 219, 70};
// Angles (0, 0, 0)
const double AxialMatrix[] = { 1.0, 0.0, 0.0, 0.0,
                              0.0, 1.0, 0.0, 0.0,
                              0.0, 0.0, 1.0, 0.0,
                              0.0, 0.0, 0.0, 1.0 };

// Angles (0, 90, 0)
const double SagittalMatrix[] = { 0.0, 0.0, 1.0, 0.0,
                                  0.0, 1.0, 0.0, 0.0,
                                  -1.0, 0.0, 0.0, 0.0,
                                  0.0, 0.0, 0.0, 1.0 };

// Angles (-90, 0, 0)
const double CoronalMatrix[] = { 1.0, 0.0, 0.0, 0.0,
                                 0.0, 0.0, 1.0, 0.0,
                                 0.0, -1.0, 0.0, 0.0,
                                 0.0, 0.0, 0.0, 1.0 };

// Angles (0, 90, 31)
const double ObliqueMatrix[] = { 0.0, -0.515038, 0.857167, 0.0,
                                  0.0, 0.857167, 0.515038, 0.0,
                                  -1.0, 0.0, 0.0, 0.0,
                                  0.0, 0.0, 0.0, 1.0 };

class ResliceRender;
// Class to handle key press events.
class KeyCallback : public vtkCommand
{
public:
    static KeyCallback* New()
    {
        return new KeyCallback();
    }
    void Execute(vtkObject* caller, unsigned long eventId, void *calldata);
    void SetCallbackData(ResliceRender* reslice);
protected:
    ResliceRender* _reslice;
};

class ResliceRender
{
public:

```

```

typedef enum _ORIENTATION
{
    AXIAL = 0,
    SAGITTAL = 1,
    CORONAL = 2,
    OBLIQUE = 3
} ORIENTATION;
ResliceRender()
{
    _orientation=AXIAL;
}
~ResliceRender()
{
    _transform->Delete();
    _reader->Delete();
    _reslice->Delete();
    _interactor->Delete();
    _imageView->Delete();
    _sphere->Delete();
    _sphereMapper->Delete();
    _sphereActor->Delete();
    _plane->Delete();
    _cutter->Delete();
    _polyTransform->Delete();
    _ROIMapper->Delete();
    _ROIActor->Delete();
    _annotation->Delete();
}
void CreatePipeline(const char* fileName)
{
    vtkProperty2D* props;
    //_reader=vtkXMLImageDataReader::New();
    //_reader->SetFileName(fileName);
    //_reader->Update();
    //_reader=qzDICOMImageReader::New();
    _reader=vtkGDCMImageReader::New();
    //vtkDirectory *d = vtkDirectory::New();
    //d->Open(fileName);
    //d->Print( std::cout );
    gdcmm::Directory d;
    d.Load(fileName);
    gdcmm::Directory::FileNamesType const &files = d.GetFilesNames();
    gdcmm::IPPSorter s;
    s.SetComputeZSpacing( true );
    s.SetZSpacingTolerance( 1e-3 );
    bool b = s.Sort( files );
    if( !b )
    {
        std::cerr << "Failed to sort:" << fileName << std::endl;
        //return ;
    }
    //std::cout << "Sorting succeeded:" << std::endl;
    //s.Print( std::cout );
    //std::cout << "Found z-spacing:" << std::endl;
    //std::cout << s.GetZSpacing() << std::endl;
    double ippszspacing = s.GetZSpacing();
    const std::vector<std::string> &sorted = s.GetFilesNames();
    vtkStringArray *vtkfiles = vtkStringArray::New();
    std::vector< std::string >::const_iterator it = sorted.begin();
    for( ; it != sorted.end(); ++it)
    {
        const std::string &f = *it;
        vtkfiles->InsertNextValue( f.c_str() );
    }
    //_reader->SetDirectoryName(fileName);
    //_reader->SetFileNames( d->GetFiles() );
    _reader->SetFileNames( vtkfiles );
    _reader->Update();
#ifdef vtkFloatingPointType
#define vtkFloatingPointType double
#endif
    const vtkFloatingPointType *spacing = _reader->GetOutput()->GetSpacing();
    vtkImageChangeInformation *v16 = vtkImageChangeInformation::New();
    #if (VTK_MAJOR_VERSION >= 6)
    v16->SetInputConnection( _reader->GetOutputPort() );
    #else
    v16->SetInput( _reader->GetOutput() );
    #endif
    v16->SetOutputSpacing( spacing[0], spacing[1], ippszspacing );
    v16->Update();
    _threshold=vtkImageThreshold::New();

```

```

    _threshold->ThresholdByUpper(-3024.0);
    _threshold->ReplaceOutOn();
    _threshold->SetOutValue(0.0);
    _threshold->SetInputConnection(v16->GetOutputPort());
    _shift=vtkImageShiftScale::New();
    _shift->SetShift(0);
    _shift->SetScale(1);
    _shift->SetInputConnection(_threshold->GetOutputPort());
    // Initialize the reslice with an axial orientation.
    vtkSmartPointer<vtkMatrix4x4> matrix =
        vtkSmartPointer<vtkMatrix4x4>::New();
    matrix->Identity();
    _transform = vtkTransform::New();
    _transform->SetMatrix(matrix);
    _reslice = vtkImageReslice::New();
    _reslice->SetOutputDimensionality(3);
    // PROBLEM:
    // The original intent was to connect the same transform
    // to the vtkImageReslice and vtkTransformPolyDataFilter,
    // but the resulting reslices appear different using the
    // vtkTransform as opposed to explicitly setting the
    // reslice axes via SetResliceAxes. Also, if the vtkTransform
    // is connected and orientated other than axial, the extents
    // don't seem to update resulting in VTK believing the slice
    // is out of range.
    //_reslice->SetResliceTransform(_transform);
    _reslice->SetResliceAxes(matrix);
    //_reslice->SetInputConnection(_reader->GetOutputPort());
    _reslice->SetInputConnection(_shift->GetOutputPort());
    // Create the sphere target shape.
    _sphere=vtkSphereSource::New();
    _sphere->SetRadius(7.0);
    _sphere->SetThetaResolution(16);
    _sphere->SetPhiResolution(16);
    _sphere->SetCenter(sphereCenter[0], sphereCenter[1], sphereCenter[2]);
    _sphereMapper=vtkPolyDataMapper::New();
    _sphereMapper->SetInputConnection(_sphere->GetOutputPort());
    _sphereActor=vtkActor::New();
    _sphereActor->SetMapper(_sphereMapper);
    _sphereActor->PickableOff();
    _sphereActor->GetProperty()->SetColor(1.0, 0.0, 0.0);
    _sphereActor->GetProperty()->SetEdgeColor(1.0, 0.0, 0.0);
    _sphereActor->GetProperty()->SetDiffuseColor(1.0, 0.0, 0.0);
    _sphereActor->SetVisibility(true);
    // Create the cutting pipeline.
    // This plane will be positioned in the original image coordinate system.
    _plane = vtkPlane::New();
    _plane->SetNormal(0.0, 0.0, 1.0);
    _cutter = vtkCutter::New();
    _cutter->SetInputConnection(_sphere->GetOutputPort());
    _cutter->SetCutFunction(_plane);
    _cutter->GenerateCutScalarsOn();
    _cutter->SetValue(0, 0.5);
    // The transform attached to _polyTransform should move the cut
    // ROI into the resliced coordinate system, which should be the
    // same as the coordinate system of the resliced images.
    // PROBLEM: It doesn't.
    _polyTransform = vtkTransformPolyDataFilter::New();
    _polyTransform->SetTransform(_transform);
    _polyTransform->SetInputConnection(_cutter->GetOutputPort());
    _ROIMapper = vtkPolyDataMapper2D::New();
    _ROIMapper->SetInputConnection(_polyTransform->GetOutputPort());
    vtkCoordinate* coordinate = vtkCoordinate::New();
    coordinate->SetCoordinateSystemToWorld();
    _ROIMapper->SetTransformCoordinate(coordinate);
    _ROIActor = vtkActor2D::New();
    _ROIActor->SetMapper(_ROIMapper);
    // Make sure the cut can be seen, especially the edges.
    props=_ROIActor->GetProperty();
    props->SetLineWidth(2);
    props->SetOpacity(1.0);
    // props->EdgeVisibilityOn();
    // props->SetDiffuse(0.8);
    // props->SetSpecular(0.3);
    // props->SetSpecularPower(20);
    // props->SetRepresentationToSurface();
    // props->SetDiffuseColor(1.0, 0.0, 0.0);
    // props->SetEdgeColor(1.0, 0.0, 0.0);
    props->SetColor(1.0, 0.0, 0.0);
    _interactor = vtkRenderWindowInteractor::New();
    // Create the image viewer and add the actor with the cut ROI.

```

```

    _imageView = vtkImageViewer2::New();
    _imageView->SetupInteractor(_interactor);
    _imageView->SetSize(400, 400);
    _imageView->SetColorWindow(1024);
    _imageView->SetColorLevel(800);
    _imageView->SetInputConnection(_reslice->GetOutputPort());
    _imageView->GetImageActor()->SetOpacity(0.5);
    _annotation = vtkTextActor::New();
    _annotation->SetTextScaleModeToViewport();
    _imageView->GetRenderer()->AddActor(_annotation);
    // Add the cut shape actor to the renderer.
    _imageView->GetRenderer()->AddActor(_ROIActor);
    // Set up the key handler.
    vtkSmartPointer<KeyCallback> callback = vtkSmartPointer<KeyCallback>::New();
    callback->SetCallbackData(this);
    _interactor->AddObserver(vtkCommand::KeyPressEvent, callback);
    _interactor->Initialize();
}

void Start()
{
    _interactor->Start();
}

void ResetOrientation()
{
    vtkSmartPointer<vtkMatrix4x4> matrix =
        vtkSmartPointer<vtkMatrix4x4>::New();
    matrix->Identity();
    SetOrientation(matrix);
}

// Make sure the orientation of the vtkImageReslice and
// vtkTransform are in sync.
void SetOrientation(vtkMatrix4x4* matrix)
{
    _reslice->SetResliceAxes(matrix);
    _reslice->Update();
    vtkMatrix4x4* inverse = vtkMatrix4x4::New();
    vtkMatrix4x4::Invert(matrix, inverse);
    _transform->SetMatrix(inverse);
    _transform->Update();
}

// Set the current slice of the current view.
void SetSlice(int slice)
{
    std::stringstream posString;
    double center[3];
    double spacing[3];
    double origin[3];
    double point[4];
    double newPoint[4];
    vtkImageData* imageData;
    int newSlice;
    // Try to make sure the extents of the reslice are updated.
    // PROBLEM: It doesn't seem to work when changing the orientation.
    imageData=vtkImageData::SafeDownCast(_reslice->GetOutput());
#ifdef VTK_MAJOR_VERSION >= 6
    assert(0);
#else
    imageData->UpdateInformation();
#endif

    // Let vtkImageViewer2 handle the slice limits.
    _imageView->SetSlice(slice);
    newSlice=GetSlice();
    imageData->GetCenter(center);
    imageData->GetSpacing(spacing);
    imageData->GetOrigin(origin);
    // Compute the position of the center of the slice based on the
    // spacing of the slices. The resliced axis will always
    // be the "Z" axis.
    point[0]=center[0];
    point[1]=center[1];
    point[2]=(newSlice * spacing[2]) + origin[2];
    point[3]=1.0;
    // Convert the coordinate from the reslice coordinate system to the
    // original image coordinate system.
    // PROBLEM: Logically this seems like it should have been multiplied
    // by the inverse to translate from the resliced coordinate system to
    // the original coordinate system. However, multiplying by the inverse
    // sticks the plane in the wrong place completely. Using the original
    // matrix at least gets the Z coordinate right.
    vtkMatrix4x4* matrix=_reslice->GetResliceAxes();
    vtkSmartPointer<vtkMatrix4x4> inverse =

```



```

        vtkSmartPointer<vtkMatrix4x4>::New();
        vtkMatrix4x4::Invert(matrix, inverse);
        matrix->MultiplyPoint(point, newPoint);
        _plane->SetOrigin(newPoint[0], newPoint[1], newPoint[2]);
        // Annotate the image.
        posString << "Position: (" << newPoint[0] << ", " << newPoint[1]
            << ", " << newPoint[2] << ") Slice: " << newSlice;
        _annotation->SetInput(posString.str().c_str());
        _imageView->Render();
    }
    int GetSlice()
    {
        return _imageView->GetSlice();
    }
    // Set the orientation of the view.
    void SetOrientation(ResliceRender::ORIENTATION orientation)
    {
        vtkCamera* camera=_imageView->GetRenderer()->GetActiveCamera();
        double spacing[3];
        double origin[3];
        double point[4];
        double newPoint[4];
        double initialPosition;
        double xDirCosine[3];
        double yDirCosine[3];
        double zDirCosine[3];
        double normal[3];
        vtkImageData* imageData;
        vtkSmartPointer<vtkMatrix4x4> matrix =
            vtkSmartPointer<vtkMatrix4x4>::New();
        _orientation=orientation;
        // Reset ViewUp
        camera->SetViewUp(0.0, 1.0, 0.0);
        // Compute the cut plane position to the input coordinate system.
        imageData=vtkImageData::SafeDownCast(_reslice->GetInput());
#ifdef (VTK_MAJOR_VERSION >= 6)
        assert(0);
#else
        imageData->UpdateInformation();
#endif
        imageData->GetSpacing(spacing);
        imageData->GetOrigin(origin);
        point[0]=origin[0];
        point[1]=origin[1];
        point[2]=origin[2];
        point[3]=1.0;
        switch (_orientation)
        {
            case AXIAL:
                matrix->DeepCopy(AxialMatrix);
                initialPosition=sphereCenter[2];
                break;
            case CORONAL:
                matrix->DeepCopy(CoronalMatrix);
                initialPosition=sphereCenter[1];
                break;
            case SAGITTAL:
                matrix->DeepCopy(SagittalMatrix);
                initialPosition=sphereCenter[0];
                break;
            case OBLIQUE:
                matrix->DeepCopy(ObliqueMatrix);
                initialPosition=sphereCenter[2];
                break;
        }
        // Move the origin from the original image coordinate system to the
        // resliced image coordinate system.
        matrix->MultiplyPoint(point, newPoint);
        matrix->SetElement(0, 3, newPoint[0]);
        matrix->SetElement(1, 3, newPoint[1]);
        matrix->SetElement(2, 3, newPoint[2]);
        ResetOrientation();
        SetOrientation(matrix);
        // Compute the cutting plane normal and set it.
        // PROBLEM: If the transformation is connected rather than
        // using SetResliceAxes, the Direction Cosines do not reflect
        // the orientation of the vtkImageReslice.
        _reslice->GetResliceAxesDirectionCosines(xDirCosine, yDirCosine,
                                                    zDirCosine);
        vtkMath::Cross(xDirCosine, yDirCosine, normal);
        _plane->SetNormal(normal);
    }

```

```

        // Set the extents and spacing of the reslice to account for
        // all of the data.
        _reslice->SetOutputExtentToDefault();
        _reslice->SetOutputSpacing(spacing[0], spacing[0], spacing[0]);
        // Force the vtkImageViewer2 to update.
        // PROBLEM: The whole extent does not seem to be set in time
        // for the first render. This results in an error because the
        // slice is positioned outside the old bounds.
#if (VTK_MAJOR_VERSION >= 6)
        _imageView->SetInputData(NULL);
#else
        _imageView->SetInput(NULL);
#endif
        _imageView->SetInputConnection(_reslice->GetOutputPort());
        _imageView->GetRenderer()->ResetCameraClippingRange();
        _imageView->GetRenderer()->ResetCamera();
        // Set the initial slice to be at the center of the sphere.
        // Divide by the spacing because this will be undone in SetSlice.
        SetSlice( (int)(initialPosition / spacing[0]));
    }
    vtkRenderWindowInteractor* GetInteractor()
    {
        return _interactor;
    }
protected:
    ORIENTATION                _orientation;
    //qzDICOMImageReader*      _reader;
    vtkGDCMImageReader*        _reader;
    vtkImageThreshold*         _threshold;
    vtkImageShiftScale*        _shift;
    vtkImageReslice*           _reslice;
    vtkRenderWindowInteractor* _interactor;
    vtkImageViewer2*           _imageView;
    vtkSphereSource*           _sphere;
    vtkPolyDataMapper*         _sphereMapper;
    vtkActor*                  _sphereActor;
    vtkPlane*                  _plane;
    vtkCutter*                 _cutter;
    vtkTransform*              _transform;
    vtkTransformPolyDataFilter* _polyTransform;
    vtkPolyDataMapper2D*        _ROIMapper;
    vtkActor2D*                _ROIActor;
    vtkTextActor*              _annotation;
};
// Catch KeyPress events.
// Up Arrow - increases the slice
// Down Arrow - decreases the slice
// 'A' - sets the view to Axial
// 'S' - sets the view to Sagittal
// 'C' - sets the view to Coronal
// 'O' - set the view to Oblique
void KeyCallback::Execute(vtkObject* caller, unsigned long eventId, void *calldata)
{
    (void)caller;
    (void)eventId;
    (void)calldata;
    std::string sym=_reslice->GetInteractor()->GetKeySym();
    if (!sym.compare("Up"))
    {
        _reslice->SetSlice(_reslice->GetSlice() + 1);
    }
    else if (!sym.compare("Down"))
    {
        _reslice->SetSlice(_reslice->GetSlice() - 1);
    }
    else if ((!sym.compare("A")) || (!sym.compare("a")))
    {
        _reslice->SetOrientation(ResliceRender::AXIAL);
    }
    else if ((!sym.compare("C")) || (!sym.compare("c")))
    {
        _reslice->SetOrientation(ResliceRender::CORONAL);
    }
    else if ((!sym.compare("S")) || (!sym.compare("s")))
    {
        _reslice->SetOrientation(ResliceRender::SAGITTAL);
    }
    else if ((!sym.compare("O")) || (!sym.compare("o")))
    {
        _reslice->SetOrientation(ResliceRender::OBLIQUE);
    }
}

```

```

}
void KeyCallback::SetCallbackData(ResliceRender* reslice)
{
    _reslice=reslice;
}
// Usage:    ResliceSphere [fileName]
int main(int argc, char *argv[])
{
    ResliceRender render;
    if (argc == 1)
    {
        const char *root = gdcm::Testing::GetDataExtraRoot();
        std::string dir3 = root;
        dir3 += "/gdcmSampleData/ForSeriesTesting/Dentist/images/";
        render.CreatePipeline(dir3.c_str());
    }
    else
    {
        render.CreatePipeline(argv[1]);
    }
    render.SetOrientation(ResliceRender::AXIAL);
    render.Start();
    return EXIT_SUCCESS;
}

```

## 12.165 rtstructapp.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "vtkGDCMPolyDataReader.h"
#include "vtkGDCMPolyDataWriter.h"
#include "vtkPolyDataWriter.h"
#include "vtkPolyDataMapper.h"
#include "vtkPolyDataMapper2D.h"
#include "vtkActor2D.h"
#include "vtkRenderWindowInteractor.h"
#include "vtkMedicalImageProperties.h"
#include "vtkRenderWindow.h"
#include "vtkRenderer.h"
#include "vtkCamera.h"
#include "vtkProperty.h"
#include "vtkProperty2D.h"
#include "vtkAppendPolyData.h"
#include "vtkImageData.h"
#include "vtkVersion.h"
/*
 * Small example to read in a RTSTRUCT and write it out (displays it too).
 */
// gdcmDataExtra/gdcmNonImageData/exRT_Structure_Set_Storage.dcm
// gdcmDataExtra/gdcmNonImageData/RTSTRUCT_1.3.6.1.4.1.22213.1.1396.2.dcm
// gdcmDataExtra/gdcmNonImageData/RT/RTStruct.dcm
int main(int argc, char *argv[])
{
    if( argc < 3 )
    {
        std::cerr << argv[0] << " input.dcm output.dcm\n";
        return 1;
    }
    const char * filename = argv[1];
    const char * outfilename = argv[2];
    vtkGDCMPolyDataReader * reader = vtkGDCMPolyDataReader::New();
    reader->SetFileName( filename );
    reader->Update();
    //std::cout << reader->GetMedicalImageProperties()->GetStudyDate() << std::endl;
    vtkGDCMPolyDataWriter * writer = vtkGDCMPolyDataWriter::New();
    writer->SetNumberOfInputPorts( reader->GetNumberOfOutputPorts() );

```

```

    writer->SetFileName( outfilename );
    for(int num = 0; num < reader->GetNumberOfOutputPorts(); ++num )
    #if (VTK_MAJOR_VERSION >= 6)
        writer->SetInputConnection( num, reader->GetOutputPort(num) );
    #else
        writer->SetInput( num, reader->GetOutput(num) );
    #endif
    //doesn't look like the medical properties are actually written out
    writer->SetMedicalImageProperties( reader->GetMedicalImageProperties() );
    writer->SetRTStructSetProperties( reader->GetRTStructSetProperties() );
    writer->Write();
    // print reader output:
    reader->Print( std::cout );
    // print first output:
    reader->GetOutput()->Print( std::cout );
    vtkAppendPolyData *append = vtkAppendPolyData::New();
    int n = reader->GetNumberOfOutputPorts();
    for(int i = 0; i < n; ++i)
    {
    #if (VTK_MAJOR_VERSION >= 6)
        append->AddInputConnection( reader->GetOutputPort(i) );
    #else
        append->AddInput( reader->GetOutput(i) );
    #endif
    }
    // Now we'll look at it.
    vtkPolyDataMapper *cubeMapper = vtkPolyDataMapper::New();
    #if (VTK_MAJOR_VERSION >= 6)
        cubeMapper->SetInputConnection( append->GetOutputPort() );
    #else
        cubeMapper->SetInput( append->GetOutput() );
    #endif
    cubeMapper->SetScalarRange(0,7);
    vtkActor *cubeActor = vtkActor::New();
    cubeActor->SetMapper(cubeMapper);
    vtkProperty *property = cubeActor->GetProperty();
    property->SetRepresentationToWireframe();
    vtkRenderer *renderer = vtkRenderer::New();
    vtkRenderWindow *renWin = vtkRenderWindow::New();
    renWin->AddRenderer(renderer);
    vtkRenderWindowInteractor *iren = vtkRenderWindowInteractor::New();
    iren->SetRenderWindow(renWin);
    renderer->AddActor(cubeActor);
    renderer->ResetCamera();
    renderer->SetBackground(1,1,1);
    renWin->SetSize(300,300);
    renWin->Render();
    iren->Start();
    reader->Delete();
    append->Delete();
    cubeMapper->Delete();
    cubeActor->Delete();
    renderer->Delete();
    renWin->Delete();
    iren->Delete();
    writer->Delete();
    return 0;
}

```

## 12.166 threadgdcm.cxx

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
#include "gdcmReader.h"
#include "gdcmImageReader.h"
#include "gdcmDirectory.h"

```

```

#include "gdcmmSystem.h"
#include "vtkImageData.h"
#include "vtkStructuredPointsWriter.h"
#include "vtkVersion.h"
#include <pthread.h>
struct threadparams
{
    const char **filenames;
    size_t nfiles;
    char *scalarpointer;
// TODO I should also pass in the dim of the reference image just in case
};
void *ReadFilesThread(void *voidparams)
{
    const threadparams *params = static_cast<const threadparams *> (voidparams);
    const size_t nfiles = params->nfiles;
    for(unsigned int file = 0; file < nfiles; ++file)
    {
        /*
// TODO: update progress
pthread_mutex_lock(&params->lock);
//section critique
ReadingProgress+=params->stepProgress;
pthread_mutex_unlock(&params->lock);
*/
        const char *filename = params->filenames[file];
        //std::cerr << filename << std::endl;
        gdcmm::ImageReader reader;
        reader.SetFileName( filename );
        try
        {
            if( !reader.Read() )
            {
                std::cerr << "Failed to read: " << filename << std::endl;
                break;
            }
        }
        catch( ... )
        {
            std::cerr << "Failed to read: " << filename << std::endl;
            break;
        }
        const gdcmm::Image &image = reader.GetImage();
        unsigned long len = image.GetBufferLength();
        char * pointer = params->scalarpointer;
    #if 0
        char *tempimage = new char[len];
        image.GetBuffer(tempimage);
        memcpy(pointer + file*len, tempimage, len);
        delete[] tempimage;
    #else
        char *tempimage = pointer + file * len;
        image.GetBuffer(tempimage);
    #endif
        return voidparams;
    }
}
void ShowFileNames(const threadparams &params)
{
    std::cout << "start" << std::endl;
    for(unsigned int i = 0; i < params.nfiles; ++i)
    {
        const char *filename = params.filenames[i];
        std::cout << filename << std::endl;
    }
    std::cout << "end" << std::endl;
}
void ReadFiles(size_t nfiles, const char *filenames[])
{
    // \precondition: nfiles > 0
    assert( nfiles > 0 );
    const char *reference= filenames[0]; // take the first image as reference
    gdcmm::ImageReader reader;
    reader.SetFileName( reference );
    if( !reader.Read() )
    {
        // That would be very bad...
        assert(0);
    }
    const gdcmm::Image &image = reader.GetImage();
    gdcmm::PixelFormat pixeltype = image.GetPixelFormat();

```

```

unsigned long len = image.GetBufferLength();
const unsigned int *dims = image.GetDimensions();
unsigned short pixelsize = pixeltype.GetPixelSize();
(void)pixelsize;
assert( image.GetNumberOfDimensions() == 2 );
vtkImageData *output = vtkImageData::New();
output->SetDimensions(dims[0], dims[1], (int)nfiles);
#if (VTK_MAJOR_VERSION >= 6)
int numscal = pixeltype.GetSamplesPerPixel();
switch( pixeltype )
{
case gdcm::PixelFormat::INT8:
output->AllocateScalars( VTK_SIGNED_CHAR, numscal );
break;
case gdcm::PixelFormat::UINT8:
output->AllocateScalars( VTK_UNSIGNED_CHAR, numscal );
break;
case gdcm::PixelFormat::INT16:
output->AllocateScalars( VTK_SHORT, numscal );
break;
case gdcm::PixelFormat::UINT16:
output->AllocateScalars( VTK_UNSIGNED_SHORT, numscal );
break;
case gdcm::PixelFormat::INT32:
output->AllocateScalars( VTK_INT, numscal );
break;
case gdcm::PixelFormat::UINT32:
output->AllocateScalars( VTK_UNSIGNED_INT, numscal );
break;
default:
assert(0);
}
#else
switch( pixeltype )
{
case gdcm::PixelFormat::INT8:
#if (VTK_MAJOR_VERSION >= 5) || ( VTK_MAJOR_VERSION == 4 && VTK_MINOR_VERSION > 5 )
output->SetScalarType ( VTK_SIGNED_CHAR );
#else
output->SetScalarType ( VTK_CHAR );
#endif
break;
case gdcm::PixelFormat::UINT8:
output->SetScalarType ( VTK_UNSIGNED_CHAR );
break;
case gdcm::PixelFormat::INT16:
output->SetScalarType ( VTK_SHORT );
break;
case gdcm::PixelFormat::UINT16:
output->SetScalarType ( VTK_UNSIGNED_SHORT );
break;
case gdcm::PixelFormat::INT32:
output->SetScalarType ( VTK_INT );
break;
case gdcm::PixelFormat::UINT32:
output->SetScalarType ( VTK_UNSIGNED_INT );
break;
default:
assert(0);
}
output->SetNumberOfScalarComponents ( pixeltype.GetSamplesPerPixel() );
output->AllocateScalars();
#endif
char * scalarpointer = static_cast<char*>(output->GetScalarPointer());
const unsigned int nthreads = 4;
threadparams params[nthreads];
//pthread_mutex_t lock;
//pthread_mutex_init(&lock, NULL);
pthread_t *pthread = new pthread_t[nthreads];
// There is nfiles, and nThreads
assert( nfiles > nthreads );
const size_t partition = nfiles / nthreads;
for (unsigned int thread=0; thread < nthreads; ++thread)
{
params[thread].filenames = filenames + thread * partition;
params[thread].nfiles = partition;
if( thread == nthreads - 1 )
{
// There is slightly more files to process in this thread:
params[thread].nfiles += nfiles % nthreads;
}
}

```

```

    assert( thread * partition < nfiles );
    params[thread].scalarpointer = scalarpointer + thread * partition * len;
    //assert( params[thread].scalarpointer < scalarpointer + 2 * dims[0] * dims[1] * dims[2] );
    // start thread:
    int res = pthread_create( &pthread[thread], NULL, ReadFilesThread, &params[thread]);
    if( res )
    {
        std::cerr << "Unable to start a new thread, pthread returned: " << res << std::endl;
        assert(0);
    }
    //ShowFileNames(params[thread]);
}
// DEBUG
size_t total = 0;
for (unsigned int thread=0; thread < nthreads; ++thread)
{
    total += params[thread].nfiles;
}
assert( total == nfiles );
// END DEBUG
for (unsigned int thread=0;thread<nthreads;thread++)
{
    pthread_join( pthread[thread], NULL);
}
delete[] pthread;
//pthread_mutex_destroy(&lock);
// For some reason writing down the file is painfully slow...
vtkStructuredPointsWriter *writer = vtkStructuredPointsWriter::New();
#if (VTK_MAJOR_VERSION >= 6)
    writer->SetInputData( output );
#else
    writer->SetInput( output );
#endif
writer->SetFileName( "/tmp/threadgdcmm.vtk" );
writer->SetFileTypeToBinary();
//writer->Write();
writer->Delete();
//output->Print( std::cout );
output->Delete();
}
int main(int argc, char *argv[])
{
    if( argc < 2 )
    {
        std::cerr << argv[0] << " [directory|list of filenames]\n";
        return 1;
    }
    // Check if user pass in a single directory
    if( argc == 2 && gdcmm::System::FileIsDirectory( argv[1] ) )
    {
        gdcmm::Directory d;
        d.Load( argv[1] );
        gdcmm::Directory::FileNamesType l = d.GetFilesNames();
        const size_t nfiles = l.size();
        const char **filenames = new const char* [ nfiles ];
        for(unsigned int i = 0; i < nfiles; ++i)
        {
            filenames[i] = l[i].c_str();
        }
        ReadFiles(nfiles, filenames);
        delete[] filenames;
    }
    else
    {
        // Simply copy all filenames into the vector:
        const char **filenames = const_cast<const char**>(argv+1);
        const size_t nfiles = argc - 1;
        ReadFiles(nfiles, filenames);
    }
    return 0;
}

```

## 12.167 AWTMedical3.java

```

/*=====

```

Program: GDCM (Grassroots DICOM). A DICOM library

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```

=====*/
package examples;
import vtk.*;
//import gdcm.*;
import vtk.util.VtkPanelContainer;
import vtk.util.VtkPanelUtil;
import vtk.util.VtkUtil;
import java.util.ArrayList;
import javax.swing.*;
import java.awt.*;
import java.io.File;
public class AWTMedical3 extends JComponent implements VtkPanelContainer {
    private vtkPanel renWin;
    vtkImageData ReadDataFile(File inSelectedFile){
        vtkImageData outImageData = null;
        Directory theDir = new Directory();
        String theInputDirectory = inSelectedFile.getPath();
        theDir.Load(theInputDirectory);
        Scanner theScanner = new Scanner();
        Tag theStudyTag = new Tag(0x0020,0x000d);
        Tag theSeriesTag = new Tag(0x0020,0x000e);
        theScanner.AddTag(theStudyTag); //get studies,
        theScanner.AddTag(theSeriesTag); //get studies,
        theScanner.Scan(theDir.GetFilesNames());
        FilenamesType theStudyValues = theScanner.GetOrderedValues(theStudyTag);
        long theNumStudies = theStudyValues.size();
        //for now, take the first study, and nothing else.
        //and the return is actually not FilenamesType, just a
        //vector of strings
        if (theNumStudies != 1)
            return outImageData;
        String theStudyVal = theStudyValues.get(0);
        //now, get all the values from the scanner that are in that
        //study, then from that get their different series
        FilenamesType theFilenames =
            theScanner.GetAllFilenamesFromTagToValue(theStudyTag, theStudyVal);
        //from that set of filenames, isolate individual series
        //conclude that singleton series = RT struct (can do further
        //checking for things like MIPs and the like)
        //and multiple series entries = volumetric data
        theScanner.Scan(theFilenames);
        FilenamesType theSeriesValues = theScanner.GetOrderedValues(theSeriesTag);
        String studyUID = theScanner.GetValue(theScanner.GetFilesNames().get(0), theStudyTag);
        long theNumSeries = theSeriesValues.size();
        for (int i = 0; i < theNumSeries; i++) {
            FilenamesType theSeriesFiles =
                theScanner.GetAllFilenamesFromTagToValue(theSeriesTag, theSeriesValues.get(i));
            long theNumFilesInSeries = theSeriesFiles.size();
            if (theNumFilesInSeries > 1) { //assume it's CT or volumetric data
                //for now, assume a single volume
                //could have multiples, like PET and CT
                IPPSorter sorter = new IPPSorter();
                sorter.SetComputeZSpacing(true);
                sorter.SetZSpacingTolerance(0.001);
                Boolean sorted = sorter.Sort(theSeriesFiles);
                if (!sorted){
                    //need some better way to handle failures here
                    return outImageData;
                }
                FilenamesType sortedFT = sorter.GetFilesNames();
                long theSize = sortedFT.size();
                vtkStringArray sa = new vtkStringArray();
                ArrayList<String> theStrings = new ArrayList<String>();
                vtkGDCMImageReader gdcmReader = new vtkGDCMImageReader();
                for (int j = 0; j < theSize; j++) {
                    String theFileName = sortedFT.get(j);
                    if (gdcmReader.CanReadFile(theFileName) > 0){
                        theStrings.add(theFileName);
                        sa.InsertNextValue(theFileName);
                    } else {
                        //this is a busted series
                        //need some more appropriate error here

```



```

        return outImageData;
    }
}
gdcmlReader.SetFileNames(sa);
gdcmlReader.Update();
outImageData = gdcmlReader.GetOutput(); //the zeroth output should be the image
}
}
String theImageInfo = "";
if (outImageData != null){
    theImageInfo = outImageData.Print();
}
return outImageData;
}
//this function is a rewrite of Medical3 to see if data can
//be loaded via gdcml easily
public AWTMedical3(File inFile) {
    // Create the buttons.
    renWin = new vtkPanel();
    vtkImageData theImageData = ReadDataFile(inFile);
    // An isosurface, or contour value of 500 is known to correspond to the
    // skin of the patient. Once generated, a vtkPolyDataNormals filter is
    // is used to create normals for smooth surface shading during rendering.
    // The triangle stripper is used to create triangle strips from the
    // isosurface these render much faster on some systems.
    vtkContourFilter skinExtractor = new vtkContourFilter();
    skinExtractor.SetInput(theImageData);
    skinExtractor.SetValue(0, 500);
    vtkPolyDataNormals skinNormals = new vtkPolyDataNormals();
    skinNormals.SetInput(skinExtractor.GetOutput());
    skinNormals.SetFeatureAngle(60.0);
    // vtkStripper skinStripper = new vtkStripper();
    // skinStripper.SetInput(skinNormals.GetOutput());
    vtkPolyDataMapper skinMapper = new vtkPolyDataMapper();
    skinMapper.SetInput(skinNormals.GetOutput());
    skinMapper.ScalarVisibilityOff();
    vtkActor skin = new vtkActor();
    skin.SetMapper(skinMapper);
    skin.GetProperty().SetDiffuseColor(1, .49, .25);
    skin.GetProperty().SetSpecular(.3);
    skin.GetProperty().SetSpecularPower(20);
    // An isosurface, or contour value of 1150 is known to correspond to the
    // skin of the patient. Once generated, a vtkPolyDataNormals filter is
    // is used to create normals for smooth surface shading during rendering.
    // The triangle stripper is used to create triangle strips from the
    // isosurface these render much faster on some systems.
    vtkContourFilter boneExtractor = new vtkContourFilter();
    boneExtractor.SetInput(theImageData);
    boneExtractor.SetValue(0, 1150);
    vtkPolyDataNormals boneNormals = new vtkPolyDataNormals();
    boneNormals.SetInput(boneExtractor.GetOutput());
    boneNormals.SetFeatureAngle(60.0);
    vtkStripper boneStripper = new vtkStripper();
    boneStripper.SetInput(boneNormals.GetOutput());
    vtkPolyDataMapper boneMapper = new vtkPolyDataMapper();
    boneMapper.SetInput(boneStripper.GetOutput());
    boneMapper.ScalarVisibilityOff();
    vtkActor bone = new vtkActor();
    bone.SetMapper(boneMapper);
    bone.GetProperty().SetDiffuseColor(1, 1, .9412);
    // An outline provides context around the data.
    vtkOutlineFilter outlineData = new vtkOutlineFilter();
    outlineData.SetInput(theImageData);
    vtkPolyDataMapper mapOutline = new vtkPolyDataMapper();
    mapOutline.SetInput(outlineData.GetOutput());
    vtkActor outline = new vtkActor();
    outline.SetMapper(mapOutline);
    outline.GetProperty().SetColor(0, 0, 0);
    // Now we are creating three orthogonal planes passing through the
    // volume. Each plane uses a different texture map and therefore has
    // different coloration.
    // Start by creating a black/white lookup table.
    vtkLookupTable bwLut = new vtkLookupTable();
    bwLut.SetTableRange(0, 2000);
    bwLut.SetSaturationRange(0, 0);
    bwLut.SetHueRange(0, 0);
    bwLut.SetValueRange(0, 1);
    bwLut.Build();
    // Now create a lookup table that consists of the full hue circle (from
    // HSV);.
    vtkLookupTable hueLut = new vtkLookupTable();

```

```

hueLut.SetTableRange(0, 2000);
hueLut.SetHueRange(0, 1);
hueLut.SetSaturationRange(1, 1);
hueLut.SetValueRange(1, 1);
hueLut.Build();
// Finally, create a lookup table with a single hue but having a range
// in the saturation of the hue.
vtkLookupTable satLut = new vtkLookupTable();
satLut.SetTableRange(0, 2000);
satLut.SetHueRange(.6, .6);
satLut.SetSaturationRange(0, 1);
satLut.SetValueRange(1, 1);
satLut.Build();
// Create the first of the three planes. The filter vtkImageMapToColors
// maps the data through the corresponding lookup table created above.
// The vtkImageActor is a type of vtkProp and conveniently displays an
// image on a single quadrilateral plane. It does this using texture
// mapping and as a result is quite fast. (Note: the input image has to
// be unsigned char values, which the vtkImageMapToColors produces.);
// Note also that by specifying the DisplayExtent, the pipeline
// requests data of this extent and the vtkImageMapToColors only
// processes a slice of data.
vtkImageMapToColors sagittalColors = new vtkImageMapToColors();
sagittalColors.SetInput(theImageData);
sagittalColors.SetLookupTable(bwLut);
vtkImageActor sagittal = new vtkImageActor();
sagittal.SetInput(sagittalColors.GetOutput());
sagittal.SetDisplayExtent(32, 32, 0, 63, 0, 92);
// Create the second (axial); plane of the three planes. We use the same
// approach as before except that the extent differs.
vtkImageMapToColors axialColors = new vtkImageMapToColors();
axialColors.SetInput(theImageData);
axialColors.SetLookupTable(hueLut);
vtkImageActor axial = new vtkImageActor();
axial.SetInput(axialColors.GetOutput());
axial.SetDisplayExtent(0, 63, 0, 63, 46, 46);
// Create the third (coronal); plane of the three planes. We use the same
// approach as before except that the extent differs.
vtkImageMapToColors coronalColors = new vtkImageMapToColors();
coronalColors.SetInput(theImageData);
coronalColors.SetLookupTable(satLut);
vtkImageActor coronal = new vtkImageActor();
coronal.SetInput(coronalColors.GetOutput());
coronal.SetDisplayExtent(0, 63, 32, 32, 0, 92);
// It is convenient to create an initial view of the data. The FocalPoint
// and Position form a vector direction. Later on (ResetCamera() method)
// this vector is used to position the camera to look at the data in
// this direction.
vtkCamera aCamera = new vtkCamera();
aCamera.SetViewUp(0, 0, -1);
aCamera.SetPosition(0, 1, 0);
aCamera.SetFocalPoint(0, 0, 0);
aCamera.ComputeViewPlaneNormal();
// Actors are added to the renderer. An initial camera view is created.
// The Dolly() method moves the camera towards the FocalPoint,
// thereby enlarging the image.
renWin.GetRenderer().AddActor(sagittal);
renWin.GetRenderer().AddActor(axial);
renWin.GetRenderer().AddActor(coronal);
renWin.GetRenderer().AddActor(outline);
renWin.GetRenderer().AddActor(skin);
renWin.GetRenderer().AddActor(bone);
// Turn off bone for this example.
bone.VisibilityOff();
// Set skin to semi-transparent.
skin.GetProperty().SetOpacity(0.5);
// An initial camera view is created. The Dolly() method moves
// the camera towards the FocalPoint, thereby enlarging the image.
renWin.GetRenderer().SetActiveCamera(aCamera);
renWin.GetRenderer().ResetCamera();
aCamera.Dolly(1.5);
// Set a background color for the renderer and set the size of the
// render window (expressed in pixels).
renWin.GetRenderer().SetBackground(1, 1, 1);
VtkPanelUtil.setSize(renWin, 640, 480);
// Note that when camera movement occurs (as it does in the Dolly()
// method), the clipping planes often need adjusting. Clipping planes
// consist of two planes: near and far along the view direction. The
// near plane clips out objects in front of the plane the far plane
// clips out objects behind the plane. This way only what is drawn
// between the planes is actually rendered.

```

```

        renWin.GetRenderer().ResetCameraClippingRange();
        // Setup panel
        setLayout(new BorderLayout());
        add(renWin, BorderLayout.CENTER);
    }
    public vtkPanel getRenWin() {
        return renWin;
    }
    public static void main(String s[]) {
        if (s.length == 0){
            return; //need a filename here
        }
        File theFile = new File(s[0]);
        //File theFile = new
            File("/Users/mmroden/Documents/MVSDownloadDirectory/Documents/1.2.840.113704.1.111.3384.1271766367.5/");
        AWTMedical3 panel = new AWTMedical3(theFile);
        JFrame frame = new JFrame("AWTMedical3");
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
        frame.getContentPane().add("Center", panel);
        frame.pack();
        frame.setVisible(true);
    }
}

```

## 12.168 HelloVTKWorld.java

/\*=====

Program: GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR  
PURPOSE. See the above copyright notice for more information.

=====\*/

// We are required to call the package 'vtk' eventhough I (MM) would have preferred  
// an import statement along the line of:

// import vtkgdcm.\*;

import vtk.\*;

/\*

\* Compilation:

\* CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac HelloVTKWorld.java

\*

\* Usage:

\* LD\_LIBRARY\_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.

CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java HelloVTKWorld gdcmData/012345.002.050.dcm  
bla.dcm

\*

\*/

public class HelloVTKWorld

{

static {

System.loadLibrary("vtkCommonJava");

System.loadLibrary("vtkFilteringJava");

System.loadLibrary("vtkIOJava");

System.loadLibrary("vtkImagingJava");

System.loadLibrary("vtkGraphicsJava");

System.loadLibrary("vtkgdcmJava");

try {

System.loadLibrary("vtkRenderingJava");

} catch (Throwable e) {

System.out.println("cannot load vtkHybrid, skipping...");

}

try {

System.loadLibrary("vtkHybridJava");

} catch (Throwable e) {

System.out.println("cannot load vtkHybrid, skipping...");

}

try {

System.loadLibrary("vtkVolumeRenderingJava");

} catch (Throwable e) {

System.out.println("cannot load vtkVolumeRendering, skipping...");

}

```

    }
    public static void main(String[] args)
    {
        String filename = args[0];
        vtkGDCMImageReader reader = new vtkGDCMImageReader();
        reader.SetFileName( filename );
        reader.Update();
        vtkMedicalImageProperties prop = reader.GetMedicalImageProperties();
        System.out.println( prop.GetPatientName() ); //
        // if( reader.GetImageFormat() == vtkgdcml.vtkgdcml.VTK_LUMINANCE ) // MONOCHROME2
        // {
        //     System.out.println( "Image is MONOCHROME2" ); //
        // }
        // Just for fun, invert the direction cosines, output should reflect that:
        vtkMatrix4x4 dircos = reader.GetDirectionCosines();
        dircos.Invert();
        // We need to maintain in sync information stored in vtkMedicalImageProperties:
        double[] cosines = new double[6];
        cosines[0] = dircos.GetElement(0,0);
        cosines[1] = dircos.GetElement(1,0);
        cosines[2] = dircos.GetElement(2,0);
        cosines[3] = dircos.GetElement(0,1);
        cosines[4] = dircos.GetElement(1,1);
        cosines[5] = dircos.GetElement(2,1);
        reader.GetMedicalImageProperties().SetDirectionCosine( cosines );
        String outfilename = args[1];
        vtkGDCMImageWriter writer = new vtkGDCMImageWriter();
        writer.SetMedicalImageProperties( reader.GetMedicalImageProperties() );
        writer.SetDirectionCosines( dircos );
        writer.SetShift( reader.GetShift() );
        writer.SetScale( reader.GetScale() );
        writer.SetImageFormat( reader.GetImageFormat() );
        writer.SetFileName( outfilename );
        writer.SetInputConnection( reader.GetOutputPort() ); // new
        //writer.SetInput( reader.GetOutput() ); // old
        writer.Write();
        System.out.println("Success reading: " + filename );
    }
}

```

## 12.169 MIPViewer.java

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR
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=====*/
import vtk.*;
import gdcml.*;
import java.io.File;
import java.awt.Canvas;
/*
 * Compilation:
 * CLASSPATH=vtkgdcml.jar:/usr/share/java/vtk.jar javac MIPViewer.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdcml.jar:gdcml.jar:. java MIPViewer BRAINX
 *
 */
public class MIPViewer extends Canvas
{
    static {
        // VTK
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
    }
}

```

```

    System.loadLibrary("vtkRenderingJava");
    System.loadLibrary("vtkVolumeRenderingJava"); // vtkSmartVolumeMapper
    System.loadLibrary("vtkWidgetsJava"); // vtkBoxWidget
    // VTK-GDCM
    System.loadLibrary("vtkgdcmJava");
}
static FilenamesType fns = new FilenamesType();
protected native int Lock();
protected native int UnLock();
public static void process(String path)
{
    fns.add( path );
}
// Process only files under dir
public static void visitAllFiles(File dir)
{
    if (dir.isDirectory())
    {
        String[] children = dir.list();
        for (int i=0; i<children.length; i++)
        {
            visitAllFiles(new File(dir, children[i]));
        }
    }
    else
    {
        process(dir.getPath());
    }
}
public static void main(String[] args) throws Exception
{
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
    {
        return;
    }
    File dir = new File(dirname);
    visitAllFiles(dir);
    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
    {
        throw new Exception("Could not scan");
    }
    double ippzspacing = ipp.GetZSpacing();
    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
        String f = sorted.get(i);
        files.InsertNextValue( f );
    }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
    reader.Update(); // get spacing value
    double[] spacing = reader.GetOutput().GetSpacing();
    vtkImageChangeInformation change = new vtkImageChangeInformation();
    change.SetInputConnection( reader.GetOutputPort() );
    change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
    // Create our volume and mapper
    vtkVolume volume = new vtkVolume();
    vtkSmartVolumeMapper mapper = new vtkSmartVolumeMapper();
    vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
    // Add a box widget if the clip option was selected
    vtkBoxWidget box = new vtkBoxWidget();
    box.SetInteractor(iren);
    box.SetPlaceFactor(1.01);
    box.SetInputConnection(change.GetOutputPort());
    //box.SetDefaultRenderer(renderer);
    box.InsideOutOn();
    box.PlaceWidget();
    //vtkBoxWidgetCallback callback = vtkBoxWidgetCallback::New();
    //callback.SetMapper(mapper);
    //box.AddObserver(vtkCommand::InteractionEvent, callback);
    //callback.Delete();
    // Lock();
    // box.EnabledOn();
    // UnLock();

```

```

box.GetSelectedFaceProperty().SetOpacity(0.0);
mapper.SetInputConnection( change.GetOutputPort() );
// Create our transfer function
vtkColorTransferFunction colorFun = new vtkColorTransferFunction();
vtkPiecewiseFunction opacityFun = new vtkPiecewiseFunction();
// Create the property and attach the transfer functions
vtkVolumeProperty property = new vtkVolumeProperty();
property.IndependentComponentsOn();
property.SetColor( colorFun );
property.SetScalarOpacity( opacityFun );
property.SetInterpolationTypeToLinear();
// connect up the volume to the property and the mapper
volume.SetProperty( property );
volume.SetMapper( mapper );
vtkMedicalImageProperties medprop = reader.GetMedicalImageProperties();
int n = medprop.GetNumberOfWindowLevelPresets();
double opacityWindow = 4096;
double opacityLevel = 2048;
// Override default with value from DICOM files:
for( int i = 0; i < n; ++i )
{
    double wl[] = medprop.GetNthWindowLevelPreset(i);
    //System.out.println( "W/L: " + wl[0] + " " + wl[1] );
    opacityWindow = wl[0];
    opacityLevel = wl[1];
}
colorFun.AddRGBSegment(0.0, 1.0, 1.0, 1.0, 255.0, 1.0, 1.0, 1.0 );
opacityFun.AddSegment( opacityLevel - 0.5*opacityWindow, 0.0,
    opacityLevel + 0.5*opacityWindow, 1.0 );
mapper.SetBlendModeToMaximumIntensity();
// Create the RenderWindow, Renderer
vtkRenderer ren1 = new vtkRenderer();
vtkRenderWindow renWin = new vtkRenderWindow();
renWin.AddRenderer(ren1);
// Set the default window size
renWin.SetSize(600,600);
// Add the volume to the scene
ren1.AddVolume( volume );
ren1.ResetCamera();
iren.SetRenderWindow( renWin );
// interact with data
renWin.Render();
iren.Start();
}
}

```

## 12.170 MPRViewer.java

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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=====*/
import vtk.*;
import gdcm.*;
import java.io.File;
/*
 * Compilation:
 * CLASSPATH=vtkgdc.jar:/usr/share/java/vtk.jar javac MPRViewer.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdc.jar:gdcm.jar:. java MPRViewer BRAINX
 *
 */
public class MPRViewer
{
    static {
        // VTK

```

```

    System.loadLibrary("vtkCommonJava");
    System.loadLibrary("vtkFilteringJava");
    System.loadLibrary("vtkIOJava");
    System.loadLibrary("vtkImagingJava");
    System.loadLibrary("vtkGraphicsJava");
    System.loadLibrary("vtkRenderingJava");
    // VTK-GDCM
    System.loadLibrary("vtkgdcmJava");
}
static FilenamesType fns = new FilenamesType();
public static void process(String path)
{
    fns.add( path );
}
// Process only files under dir
public static void visitAllFiles(File dir)
{
    if (dir.isDirectory())
    {
        String[] children = dir.list();
        for (int i=0; i<children.length; i++)
        {
            visitAllFiles(new File(dir, children[i]));
        }
    }
    else
    {
        process(dir.getPath());
    }
}
public static void main(String[] args) throws Exception
{
    String dirname = args[0];
    if( !PosixEmulation.FileIsDirectory( dirname ) )
    {
        return;
    }
    File dir = new File(dirname);
    visitAllFiles(dir);
    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
    {
        throw new Exception("Could not scan");
    }
    double ippzspacing = ipp.GetZSpacing();
    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
        String f = sorted.get(i);
        files.InsertNextValue( f );
    }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
    reader.Update(); // get spacing value
    double[] spacing = reader.GetOutput().GetSpacing();
    vtkImageChangeInformation change = new vtkImageChangeInformation();
    change.SetInputConnection( reader.GetOutputPort() );
    change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
    // A simple vtkInteractorStyleImage example for
    // 3D image viewing with the vtkImageResliceMapper.
    //
    // Drag Left mouse button to window/level
    // Shift-Left drag to rotate (oblique slice)
    // Shift-Middle drag to slice through image
    // OR Ctrl-Right drag to slice through image
    // Create the RenderWindow, Renderer
    vtkRenderer ren1 = new vtkRenderer();
    vtkRenderWindow renWin = new vtkRenderWindow();
    renWin.AddRenderer(ren1);
    vtkImageResliceMapper im = new vtkImageResliceMapper();
    im.SetInputConnection(change.GetOutputPort());
    im.SliceFacesCameraOn();
    im.SliceAtFocalPointOn();
    im.BorderOff();
    vtkImageProperty ip = new vtkImageProperty();
    ip.SetColorWindow(2000);

```

```

        ip.SetColorLevel(1000);
        ip.SetAmbient(0.0);
        ip.SetDiffuse(1.0);
        ip.SetOpacity(1.0);
        ip.SetInterpolationTypeToLinear();
        vtkImageSlice ia = new vtkImageSlice();
        ia.SetMapper(im);
        ia.SetProperty(ip);
        ren1.AddViewProp(ia);
        ren1.SetBackground(0.1,0.2,0.4);
        renWin.SetSize(300,300);
        vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
        vtkInteractorStyleImage style = new vtkInteractorStyleImage();
        style.SetInteractionModeToImage3D();
        iren.SetInteractorStyle(style);
        renWin.SetInteractor(iren);
        // render the image
        renWin.Render();
        vtkCamera cam1 = ren1.GetActiveCamera();
        cam1.ParallelProjectionOn();
        ren1.ResetCameraClippingRange();
        renWin.Render();
        iren.Start();
    }
}

```

## 12.171 MPRViewer2.java

```
/*=====
```

Program: GDCM (Grassroots DICOM). A DICOM library

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```

=====*/
import vtk.*;
import gdcm.*;
import java.io.File;
/*
 * Compilation:
 * CLASSPATH=vtkgdcm.jar:/usr/share/java/vtk.jar javac MPRViewer2.java
 *
 * Usage:
 * LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:/usr/lib/jni:.
 * CLASSPATH=/usr/share/java/vtk.jar:vtkgdcm.jar:gdcm.jar:. java MPRViewer2 BRAINX
 *
 */
public class MPRViewer2
{
    static {
        // VTK
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkRenderingJava");
        System.loadLibrary("vtkHybridJava");
        System.loadLibrary("vtkWidgetsJava");
        // VTK-GDCM
        System.loadLibrary("vtkgdcmJava");
    }
    static FilenamesType fns = new FilenamesType();
    public static void process(String path)
    {
        fns.add( path );
    }
    // Process only files under dir
    public static void visitAllFiles(File dir)
    {
        if (dir.isDirectory())

```



```

        {
            String[] children = dir.list();
            for (int i=0; i<children.length; i++)
            {
                visitAllFiles(new File(dir, children[i]));
            }
        }
    else
    {
        process(dir.getPath());
    }
}

public void dointer(vtkImagePlaneWidget current_widget)
{
    int cstat = current_widget.GetCursorDataStatus();
    double[] v = current_widget.GetCurrentCursorPosition();
    //System.out.println( cstat );
    //System.out.println( v[0] );
    //System.out.println( v[1] );
    //System.out.println( v[2] );
    planeWidgetX.SetSliceIndex( (int)v[0] );
    planeWidgetY.SetSliceIndex( (int)v[1] );
    planeWidgetZ.SetSliceIndex( (int)v[2] );
    planeWidgetX.GetCurrentRenderer().ResetCameraClippingRange();
    planeWidgetY.GetCurrentRenderer().ResetCameraClippingRange();
    planeWidgetZ.GetCurrentRenderer().ResetCameraClippingRange();
}

public void startinterX()
{
    dointer( planeWidgetX );
}

public void interX()
{
    dointer( planeWidgetX );
}

public void endinterX()
{
}

public void startinterY()
{
    dointer( planeWidgetY );
}

public void interY()
{
    dointer( planeWidgetY );
}

public void endinterY()
{
}

public void startinterZ()
{
    dointer( planeWidgetZ );
}

public void interZ()
{
    dointer( planeWidgetZ );
}

public void endinterZ()
{
    //System.out.println( "endinter" );
}

public static void AlignCamera(int slice_number, vtkImagePlaneWidget current_widget)
{
    vtkImageData image = (vtkImageData)current_widget.GetInput();
    vtkRenderer ren = current_widget.GetCurrentRenderer();
    double[] origin = image.GetOrigin();
    double ox = origin[0];
    double oy = origin[1];
    double oz = origin[2];
    int dims[] = image.GetDimensions();
    int xmin = 0;
    int xmax = 1;
    int ymin = 2;
    int ymax = dims[0]-1;
    int zmin = dims[1]-1;
    int zmax = dims[2]-1;
    double[] spacing = image.GetSpacing();
    double sx = spacing[0];
    double sy = spacing[1];
    double sz = spacing[2];
    double cx = ox+(0.5*(xmax-xmin))*sx;

```

```

double cy = oy+(0.5*(yMax-yMin))*sy;
double cz = oy+(0.5*(zMax-zMin))*sz;
double vx = 0, vy = 0, vz = 0;
double nx = 0, ny = 0, nz = 0;
int iaxis = current_widget.GetPlaneOrientation();
if ( iaxis == 0 ) {
    vz = -1;
    nx = ox + xMax*sx;
    cx = ox + slice_number*sx;
}
else if ( iaxis == 1 ) {
    vz = -1;
    ny = oy+yMax*sy;
    cy = oy+slice_number*sy;
}
else {
    vy = 1;
    nz = oz+zMax*sz;
    cz = oz+slice_number*sz;
}
double px = cx+nx*2;
double py = cy+ny*2;
double pz = cz+nz*3;
vtkCamera camera = ren.GetActiveCamera();
camera.SetViewUp(vx, vy, vz);
camera.SetFocalPoint(cx, cy, cz);
camera.SetPosition(px, py, pz);
camera.OrthogonalizeViewUp();
ren.ResetCameraClippingRange();
}
private vtkImagePlaneWidget planeWidgetX = new vtkImagePlaneWidget();
private vtkImagePlaneWidget planeWidgetY = new vtkImagePlaneWidget();
private vtkImagePlaneWidget planeWidgetZ = new vtkImagePlaneWidget();
public void config()
{
    //System.out.println( "config" );
    planeWidgetX.GetCurrentRenderer().ResetCamera();
    planeWidgetY.GetCurrentRenderer().ResetCamera();
    planeWidgetZ.GetCurrentRenderer().ResetCamera();
}
public void Run(String dirname)
{
    File dir = new File(dirname);
    visitAllFiles(dir);
    IPPSorter ipp = new IPPSorter();
    ipp.SetComputeZSpacing( true );
    ipp.SetZSpacingTolerance( 1e-3 );
    boolean b = ipp.Sort( fns );
    if(!b)
    {
        //throw new Exception("Could not scan");
    }
    double ippzspacing = ipp.GetZSpacing();
    FilenamesType sorted = ipp.GetFilenames();
    vtkStringArray files = new vtkStringArray();
    long nfiles = sorted.size();
    //for( String f : sorted )
    for (int i = 0; i < nfiles; i++) {
        String f = sorted.get(i);
        files.InsertNextValue( f );
    }
    vtkGDCMImageReader reader = new vtkGDCMImageReader();
    reader.SetFileNames( files );
    reader.Update(); // get spacing value
    double[] spacing = reader.GetOutput().GetSpacing();
    vtkImageChangeInformation change = new vtkImageChangeInformation();
    change.SetInputConnection( reader.GetOutputPort() );
    change.SetOutputSpacing( spacing[0], spacing[1], ippzspacing );
    change.Update();
    System.out.println( change.GetOutput().toString() );
    vtkRenderer ren1 = new vtkRenderer();
    ren1.SetViewport(0., 0., 0.333, 1);
    ren1.SetBackground(0.1,0.2,0.4);
    vtkRenderer ren2 = new vtkRenderer();
    ren2.SetViewport(0.333, 0., 0.667, 1);
    ren2.SetBackground(0.1,0.2,0.4);
    vtkRenderer ren3 = new vtkRenderer();
    ren3.SetViewport(0.667, 0., 1., 1.);
    ren3.SetBackground(0.1,0.2,0.4);
    vtkRenderWindow renWin = new vtkRenderWindow();
    renWin.AddRenderer(ren1);

```

```

renWin.AddRenderer(ren2);
renWin.AddRenderer(ren3);
vtkRenderWindowInteractor iren = new vtkRenderWindowInteractor();
iren.SetRenderWindow(renWin);
vtkInteractorStyleImage style = new vtkInteractorStyleImage();
iren.SetInteractorStyle( style );
vtkCellPicker picker = new vtkCellPicker();
picker.SetTolerance(0.005);
vtkProperty ipwProp = new vtkProperty();
//vtkImagePlaneWidget planeWidgetX = new vtkImagePlaneWidget();
planeWidgetX.SetInteractor(iren);
planeWidgetX.SetCurrentRenderer(ren1);
planeWidgetX.SetDefaultRenderer(ren1);
planeWidgetX.RestrictPlaneToVolumeOn();
planeWidgetX.SetTexturePlaneProperty(ipwProp);
//planeWidgetX.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetX.TextureInterpolateOff();
//planeWidgetX.SetResliceInterpolateToNearestNeighbour();
planeWidgetX.SetInputConnection(change.GetOutputPort());
planeWidgetX.SetPlaneOrientationToXAxes();
planeWidgetX.SetSliceIndex(62);
planeWidgetX.SetPicker(picker);
planeWidgetX.SetKeyPressActivationValue('x');
planeWidgetX.On();
planeWidgetX.InteractionOn();
//vtkImagePlaneWidget planeWidgetY = new vtkImagePlaneWidget();
planeWidgetY.SetInteractor(iren);
planeWidgetY.SetCurrentRenderer(ren2);
planeWidgetY.SetDefaultRenderer(ren2);
planeWidgetY.RestrictPlaneToVolumeOn();
planeWidgetY.SetTexturePlaneProperty(ipwProp);
//planeWidgetY.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetY.TextureInterpolateOff();
//planeWidgetY.SetResliceInterpolateToNearestNeighbour();
planeWidgetY.SetInputConnection(change.GetOutputPort());
planeWidgetY.SetLookupTable( planeWidgetX.GetLookupTable() );
planeWidgetY.SetPlaneOrientationToYAxes();
planeWidgetY.SetSliceIndex(32);
planeWidgetY.SetPicker(picker);
planeWidgetY.SetKeyPressActivationValue('y');
planeWidgetY.On();
//vtkImagePlaneWidget planeWidgetZ = new vtkImagePlaneWidget();
planeWidgetZ.SetInteractor(iren);
planeWidgetZ.SetCurrentRenderer(ren3);
planeWidgetZ.SetDefaultRenderer(ren3);
planeWidgetZ.RestrictPlaneToVolumeOn();
planeWidgetZ.SetTexturePlaneProperty(ipwProp);
//planeWidgetZ.GetPlaneProperty().SetColor(1,0,0);
//planeWidgetZ.TextureInterpolateOff();
//planeWidgetZ.SetResliceInterpolateToNearestNeighbour();
planeWidgetZ.SetInputConnection(change.GetOutputPort());
planeWidgetZ.SetLookupTable( planeWidgetX.GetLookupTable() );
planeWidgetZ.SetPlaneOrientationToZAxes();
planeWidgetZ.SetSliceIndex(32);
planeWidgetZ.SetPicker(picker);
planeWidgetZ.SetKeyPressActivationValue('z');
planeWidgetZ.On();
iren.Initialize();
renWin.Render();
AlignCamera(52, planeWidgetX);
AlignCamera(32, planeWidgetY);
AlignCamera(32, planeWidgetZ);
planeWidgetX.GetCurrentRenderer().ResetCamera();
planeWidgetY.GetCurrentRenderer().ResetCamera();
planeWidgetZ.GetCurrentRenderer().ResetCamera();
renWin.Render();
planeWidgetX.AddObserver("StartInteractionEvent", this,"startinterX");
planeWidgetX.AddObserver("InteractionEvent", this,"interX");
planeWidgetX.AddObserver("EndInteractionEvent", this,"endinterX");
planeWidgetY.AddObserver("StartInteractionEvent", this,"startinterY");
planeWidgetY.AddObserver("InteractionEvent", this,"interY");
planeWidgetY.AddObserver("EndInteractionEvent", this,"endinterY");
planeWidgetZ.AddObserver("StartInteractionEvent", this,"startinterZ");
planeWidgetZ.AddObserver("InteractionEvent", this,"interZ");
planeWidgetZ.AddObserver("EndInteractionEvent", this,"endinterZ");
iren.AddObserver("ConfigureEvent", this,"config");
iren.Start();
}
public static void main(String[] args) throws Exception
{
    String dirname = args[0];

```

```

    if( !PosixEmulation.FileIsDirectory( dirname ) )
    {
        return;
    }
    MPRViewer2 me = new MPRViewer2();
    me.Run( dirname );
}
}

```

## 12.172 ReadSeriesIntoVTK.java

```

/*=====
Program:  GDCM (Grassroots DICOM). A DICOM library

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PURPOSE. See the above copyright notice for more information.

=====*/
// We are required to call the package 'vtk' eventhough I (MM) would have preferred
// an import statement along the line of:
// import vtkgdcmm.*;
import vtk.*;
/*
 * Usage:
 * export LD_LIBRARY_PATH=/usr/lib/jvm/java-6-openjdk/jre/lib/amd64/xawt:.
 * java -classpath 'pwd'/vtkgdcmm.jar:/usr/share/java/vtk.jar:. ReadSeriesIntoVTK
 */
public class ReadSeriesIntoVTK
{
    static {
        System.loadLibrary("vtkCommonJava");
        System.loadLibrary("vtkFilteringJava");
        System.loadLibrary("vtkIOJava");
        System.loadLibrary("vtkImagingJava");
        System.loadLibrary("vtkGraphicsJava");
        System.loadLibrary("vtkgdcmmJava");
        try {
            System.loadLibrary("vtkRenderingJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkHybrid, skipping...");
        }
        try {
            System.loadLibrary("vtkHybridJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkHybrid, skipping...");
        }
        try {
            System.loadLibrary("vtkVolumeRenderingJava");
        } catch (Throwable e) {
            System.out.println("cannot load vtkVolumeRendering, skipping...");
        }
    }
    public static void main(String[] args)
    {
        vtkFileOutputWindow outWin = new vtkFileOutputWindow();
        outWin.SetInstance(outWin);
        outWin.SetFileName("MVSVTKViewer.log");
        // See: http://review.source.kitware.com/#change,888
        // vtkWrapJava does not handle static keyword
        // String directory = vtkGDCMTesting.GetGDCMDataRoot();
        vtkGDCMTesting t = new vtkGDCMTesting();
        String directory = t.GetGDCMDataRoot();
        String file0 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq0.dcm";
        String file1 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq1.dcm";
        String file2 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq2.dcm";
        String file3 = directory + "/SIEMENS_MAGNETOM-12-MONO2-FileSeq3.dcm";
        vtkStringArray s = new vtkStringArray();
        System.out.println("adding : " + file0 );
        s.InsertNextValue( file0 );
        s.InsertNextValue( file1 );
        s.InsertNextValue( file2 );
    }
}

```

```

s.InsertNextValue( file3 );
vtkGDCMImageReader reader = new vtkGDCMImageReader();
reader.SetFileNames( s );
reader.Update();
System.out.println("Success reading: " + file0 );
vtkMetaImageWriter writer = new vtkMetaImageWriter();
writer.DebugOn();
writer.SetCompression( false );
writer.SetInputConnection( reader.GetOutputPort() );
writer.SetFileName( "ReadSeriesIntoVTK.mhd" );
writer.Write();
System.out.println("Success writing: " + writer.GetFileName() );
}
}

```

## 12.173 CastConvertPhilips.py

```

1
14
15 """
16 Usage:
17
18 python --public /path/to/directory/
19 or
20 python --private /path/to/directory/
21
22 python --public --extension bak /path/to/directory/
23
24 rename -f 's/\.bak$//' *.bak
25
26 TODO:
27 http://docs.python.org/library/optparse.html#module-optparse
28 """
29
30 import vtkgdcml
31 import vtk
32 import sys
33 import gdcml
34
35 def ProcessOneFilePublic(filename, outfilename, tmpfile):
36     gdcml.ImageHelper.SetForceRescaleInterceptSlope(True)
37     vtkreader = vtkgdcml.vtkGDCMImageReader()
38     vtkreader.SetFileName( filename )
39     vtkreader.Update()
40
41     cast = vtk.vtkImageCast()
42     cast.SetInput( vtkreader.GetOutput() )
43     cast.SetOutputScalarTypeToUnsignedShort()
44
45     # vtkGDCMImageWriter does not support Sequence, so let's write a tmp file first:
46     # Some operation will actually be discarded (we simply need a temp storage)
47     vtkwriter = vtkgdcml.vtkGDCMImageWriter()
48     vtkwriter.SetFileName( tmpfile )
49     vtkwriter.SetMedicalImageProperties( vtkreader.GetMedicalImageProperties() )
50     vtkwriter.SetDirectionCosines( vtkreader.GetDirectionCosines() )
51     print "Format:", vtkreader.GetImageFormat()
52     vtkwriter.SetImageFormat( vtkreader.GetImageFormat() )
53     vtkwriter.SetInput( cast.GetOutput() )
54     #vtkwriter.Update()
55     vtkwriter.Write()
56
57     # ok now rewrite the exact same file as the original (keep all info)
58     # but use the Pixel Data Element from the written file
59     tmpreader = gdcml.ImageReader()
60     tmpreader.SetFileName( tmpfile )
61     if not tmpreader.Read():
62         sys.exit(1)
63
64     reader = gdcml.Reader()
65     reader.SetFileName( filename )
66     if not reader.Read():
67         sys.exit(1)
68
69     # Make sure to remove Slope/Rescale to avoid re-execution
70     ds = reader.GetFile().GetDataSet()
71     tags = [
72         gdcml.Tag(0x0028,0x1052),

```

```

73     gdc.Tag(0x0028,0x1053),
74     gdc.Tag(0x0028,0x1053),
75 ]
76 for tag in tags:
77     ds.Remove( tag )
78
79 writer = gdc.ImageWriter()
80 writer.SetFileName( outfilename )
81 # Pass image from vtk written file
82 writer.SetImage( tmpreader.GetImage() )
83 # pass dataset from initial 'reader'
84 writer.SetFile( reader.GetFile() )
85 if not writer.Write():
86     sys.exit(1)
87
88 def ProcessOneFilePrivate(filename, outfilename, tmpfile):
89     vtkreader = vtkgdc.vtkGDCMImageReader()
90     vtkreader.SetFileName( filename )
91     vtkreader.Update()
92
93
94     # (2005,1409)      DS      4      0.0
95     # (2005,140a)      DS     16     1.52283272283272
96
97     # (2005,0014)      LO     26     Philips MR Imaging DD 005
98     tag1 = gdc.PrivateTag(0x2005,0x09,"Philips MR Imaging DD 005")
99     tag2 = gdc.PrivateTag(0x2005,0x0a,"Philips MR Imaging DD 005")
100
101
102
103     # Need to access some private tags, reread the file (for now):
104     reader = gdc.Reader()
105     reader.SetFileName( filename )
106     if not reader.Read():
107         sys.exit(1)
108
109     ds = reader.GetFile().GetDataSet()
110
111     e11 = ds.GetDataElement( tag1 )
112     e12 = ds.GetDataElement( tag2 )
113
114
115     #pf = gdc.PythonFilter()
116     #pf.SetFile( reader.GetFile() )
117     #print e11.GetTag()
118
119     print e11.GetByteValue()
120     v1 = eval(e11.GetByteValue().GetBuffer())
121     print e12.GetByteValue()
122     v2 = eval(e12.GetByteValue().GetBuffer())
123
124     print v1
125     shift = v1
126     print v2
127     scale = v2
128
129     ss = vtk.vtkImageShiftScale()
130     ss.SetInput( vtkreader.GetOutput() )
131     # because VTK image shift / scale convention is inverted from DICOM make sure shift is 0
132     assert shift == 0
133     ss.SetShift( shift )
134     ss.SetScale( scale )
135     ss.SetOutputScalarTypeToUnsignedShort ()
136     ss.Update()
137
138     # vtkGDCMImageWriter does not support Sequence, so let's write a tmp file first:
139     # Some operation will actually be discarded (we simply need a temp storage)
140     vtkwriter = vtkgdc.vtkGDCMImageWriter()
141     vtkwriter.SetFileName( tmpfile )
142     vtkwriter.SetMedicalImageProperties( vtkreader.GetMedicalImageProperties() )
143     vtkwriter.SetDirectionCosines( vtkreader.GetDirectionCosines() )
144     vtkwriter.SetImageFormat( reader.GetImageFormat() )
145     # do not pass shift/scale again
146     vtkwriter.SetInput( ss.GetOutput() )
147     #vtkwriter.Update()
148     vtkwriter.Write()
149
150     # ok now rewrite the exact same file as the original (keep all info)
151     # but use the Pixel Data Element from the written file
152     tmpreader = gdc.ImageReader()
153     tmpreader.SetFileName( tmpfile )

```

```

154     if not tmpreader.Read():
155         sys.exit(1)
156
157     writer = gdcm.ImageWriter()
158     writer.SetFileName( outfilename )
159     # Pass image from vtk written file
160     writer.SetImage( tmpreader.GetImage() )
161     # pass dataset from initial 'reader'
162     writer.SetFile( reader.GetFile() )
163     if not writer.Write():
164         sys.exit(1)
165
166 if __name__ == "__main__":
167
168     gdcm.Trace.DebugOff()
169     gdcm.Trace.WarningOff()
170     #filename = sys.argv[1]
171     #outfilename = sys.argv[2]
172     tmpfile = "/tmp/philips_rescaled.dcm"
173     #ProcessOneFile( filename, outfilename, tmpfile )
174     rescaletype = sys.argv[1]
175     assert rescaletype == "--public" or rescaletype == "--private"
176     dirname = sys.argv[2]
177     d = gdcm.Directory()
178     d.Load( dirname )
179
180     for f in d.GetFileNames():
181         #print f
182         ProcessOneFilePublic( f, f + ".bak", tmpfile )
183
184
185 print "success"

```

## 12.174 headsq2dcm.py

```

1
14
15 """
16 Usage:
17 python headsq2dcm.py -D /path/to/VTKData
18 """
19
20 import vtk
21 import vtkgdcm
22 from vtk.util.misc import vtkGetDataRoot
23 VTK_DATA_ROOT = vtkGetDataRoot()
24
25 reader = vtk.vtkVolumetricReader()
26 reader.SetDataDimensions(64, 64)
27 reader.SetDataByteOrderToLittleEndian()
28 reader.SetFilePrefix(VTK_DATA_ROOT + "/Data/headsq/quarter")
29 reader.SetImageRange(1, 93)
30 reader.SetDataSpacing(3.2, 3.2, 1.5)
31
32 cast = vtk.vtkImageCast()
33 cast.SetInput( reader.GetOutput() )
34 cast.SetOutputScalarTypeToUnsignedChar()
35
36 # By default this is creating a Multiframe Grayscale Word Secondary Capture Image Storage
37 writer = vtkgdcm.vtkGDCMImageWriter()
38 writer.SetFileName( "headsq.dcm" )
39 writer.SetInput( reader.GetOutput() )
40 # cast -> Multiframe Grayscale Byte Secondary Capture Image Storage
41 #writer.SetInput( cast.GetOutput() )
42 writer.SetFileDimensionality( 3 )
43 writer.Write()

```





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