BRAINLAB

Technical Publication

DICOM Conformance Statement

Patient Data Manager 1.0.1

Document Revision 2

January 17, 2012

1 Conformance Statement Overview

This is a conformance statement for the Brainlab software Patient Data Manager. One main purpose of this software is to import and visualize DICOM data.

The DICOM import part of the application is

- Browse and display of DICOM files (e.g. removable media)
- Query remote DICOM archives
- Retrieve DICOM data from archives
- Write DICOM data to CD-R's and DVD Media
- Store DICOM data to remote archives

SOP Classes	User Of Service (SCU)	Provider Of Service (SCP)
Transfer		
Enhanced CT Image	Yes	Yes
Enhanced MR Image	Yes	Yes
SC Multi Frame Grayscale Byte	Yes	Yes
SC Multi Frame Grayscale Word	Yes	Yes
SC Multi Frame Single Bit	Yes	Yes
SC Multi Frame True Color	Yes	Yes
Segmentation Storage	Yes	Yes
Standard CR	Yes	Yes
Standard CT	Yes	Yes
Standard Digital X-Ray Image for Image for Presentation	Yes	Yes
Standard Digital X-Ray Image for Image for Processing	Yes	Yes
Standard Grayscale Softcopy Image for Presentation State	Yes	Yes
Standard Hardcopy Color	Yes	Yes
Standard Hardcopy Grayscale	Yes	Yes
Standard Intra-oral X-Ray Image for Presentation	Yes	Yes
Standard Intra-oral X-Ray Image for Processing	Yes	Yes
Standard MG Image for Presentation	Yes	Yes
Standard MG Image for Processing	Yes	Yes
Standard MR	Yes	Yes
Standard NM	Yes	Yes
Standard NM Retired	Yes	Yes
Standard Ophthalmic 16 Bit	Yes	Yes
Standard Ophthalmic 8 Bit	Yes	Yes
Standard PET	Yes	Yes
Standard RT Image	Yes	Yes
Standard Secondary Capture	Yes	Yes
Standard US	Yes	Yes
Standard US Multi Frame	Yes	Yes
Standard US Multi Frame Retired	Yes	Yes

SOP Classes	User Of Service (SCU)	Provider Of Service (SCP)
Standard US Retired	Yes	Yes
Standard Video Endoscopic	Yes	Yes
Standard Video Microscopic	Yes	Yes
Standard Video Photographic	Yes	Yes
Standard VL Endoscopic	Yes	Yes
Standard VL Microscopic	Yes	Yes
Standard VL Photographic	Yes	Yes
Standard VL Slide Microscopic	Yes	Yes
Standard X-Ray Angio	Yes	Yes
Standard X-Ray Angio Biplane	Yes	Yes
Standard X-Ray RF	Yes	Yes

Table 1-1: Services supported by Patient Data Manager

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disc – Recordable		
General Purpose CD–R	Yes	Yes
General Purpose DVD with Compression	Yes	Yes

Table 1-2: Media Services supported by Patient Data Manager

The DICOM Processing Service is embedded into the Brainlab Workflow Services.

Brainlab Workflow Service	User Of Service (SCU)	Provider Of Service (SCP)
Notify	No	Yes
Find Entities	Yes	No
Request Instances	Yes	No

Table 1-3: Brainlab Workflow Services supported by the Processing Service

The Brainlab Workflow services are described in the DICOM Proxy Conformance Statement (see [2]) and are not part of this conformance statement.

2 Table Of Contents

3 Introduction

3.1 Revision History

Document Version	Date of Issue	Author	Description
1	Sep 08, 2011	Kerschbaumer Samuel	Initial version
2	January 17, 2012	Kerschbaumer Samuel	Update for 1.0.1

3.2 Audience

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.3 Remarks

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [1]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different conformance statements is the first step towards assessing interconnectivity between Brainlab and non–Brainlab equipment.
- This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.
- The DICOM standard will evolve to meet the users' future requirements. Brainlab reserves the right to make changes to its products or to discontinue its delivery.

3.4 Abbreviations

There are a variety of terms and abbreviations used in the document that are defined in the DICOM Standard. Abbreviations and terms are as follows:

AE	DICOM Application Entity
AET	Application Entity Title
CD	Compact Disk
CD-R	Compact Disk Recordable
DVD	Digital Versatile Disc
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HD	Hard Disk
IOD	(DICOM) Information Object Definition
ISO	International Standard Organization
MOD	Magneto Optical Disk
PDU	DICOM Protocol Data Unit
Q/R	Query and Retrieve
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair

3.5 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-3.18 – 2006
[2] DICOM Conformance Statement DICOM Proxy 2.1, Brainlab, April 4, 2011

4 Networking

4.1 Implementation Model

The Patient Data Manager is embedded in the Brainlab workflow infrastructure. These infrastructure is provided by the DICOM Proxy. It provides the DICOM Storage, Query/Retrieve and Worklist interfaces to communicate with the world outside. The Patient Data Manager communicates only with the DICOM Proxy.

The Patient Data Manager uses the following activities to interact with the DICOM Proxy:

- *Notify*
  The DICOM Proxy notifies registered applications about received DICOM instances.
- *Find Entities*
  The DICOM Proxy provides the DICOM Query/Retrieve C-FIND service as SCP
- *Request Instances*
  The DICOM Proxy provides the DICOM Query/Retrieve C-GET service as SCP

Please refer to [2] for a detailed description of these activities. This DICOM Conformance Statement concentrates on the Patient Data Manager and how it finds and reads DICOM instances.

The Patient Data Manager then is an implementation of:

- Patient Browser
  - Search for a patient and select it for treatment
  - Export DICOM data of a patient to a remote DICOM Archive
- Image Viewer
  - Query and Retrieve the Studies, Series and Instances of the selected patient and show the received entities.

4.1.1 Application Data Flow Diagram

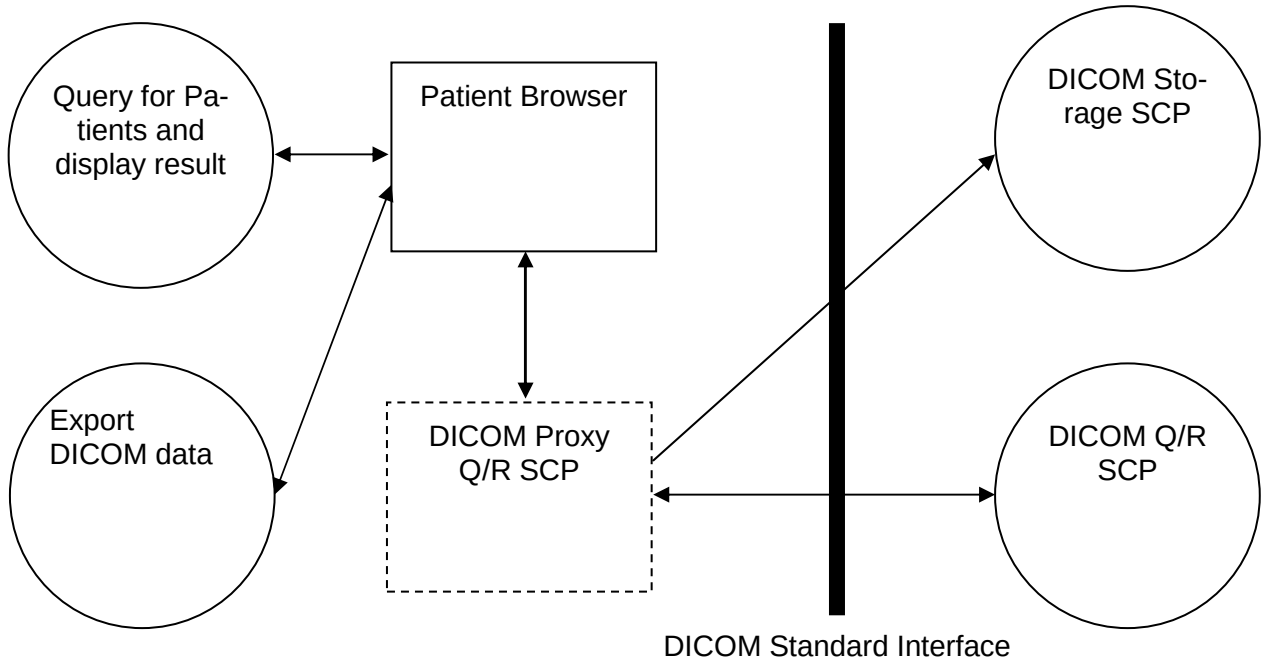


Figure 4-1: Patient Browser Application flow diagram

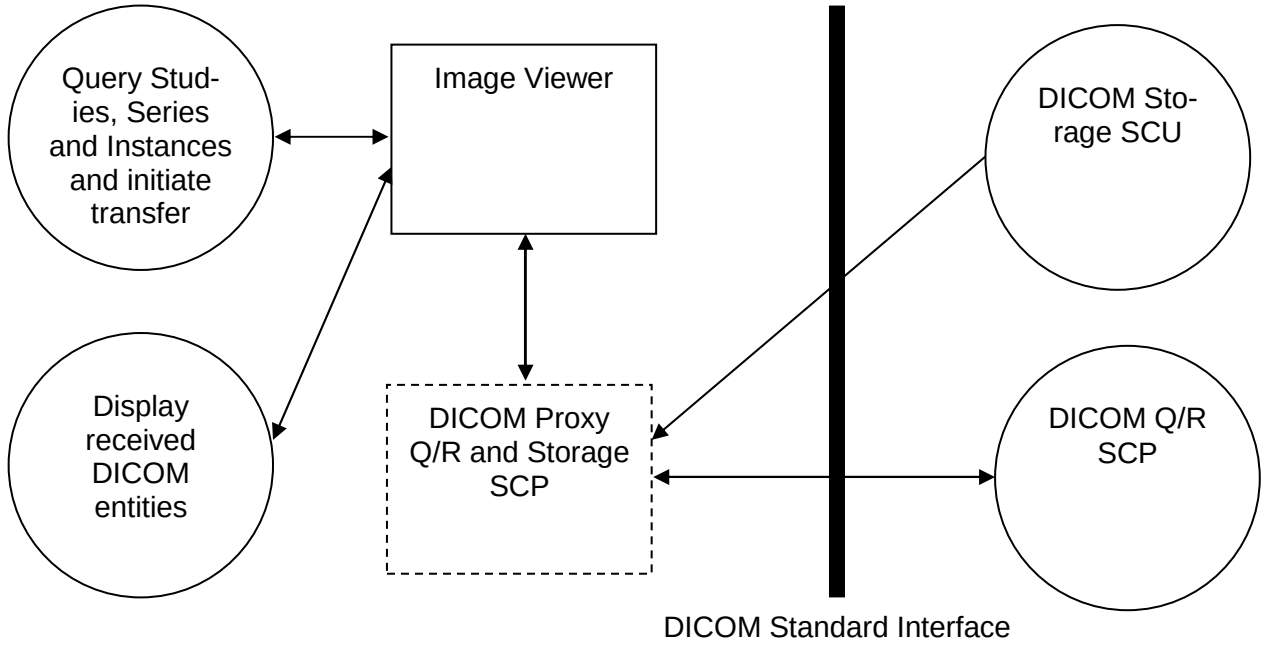


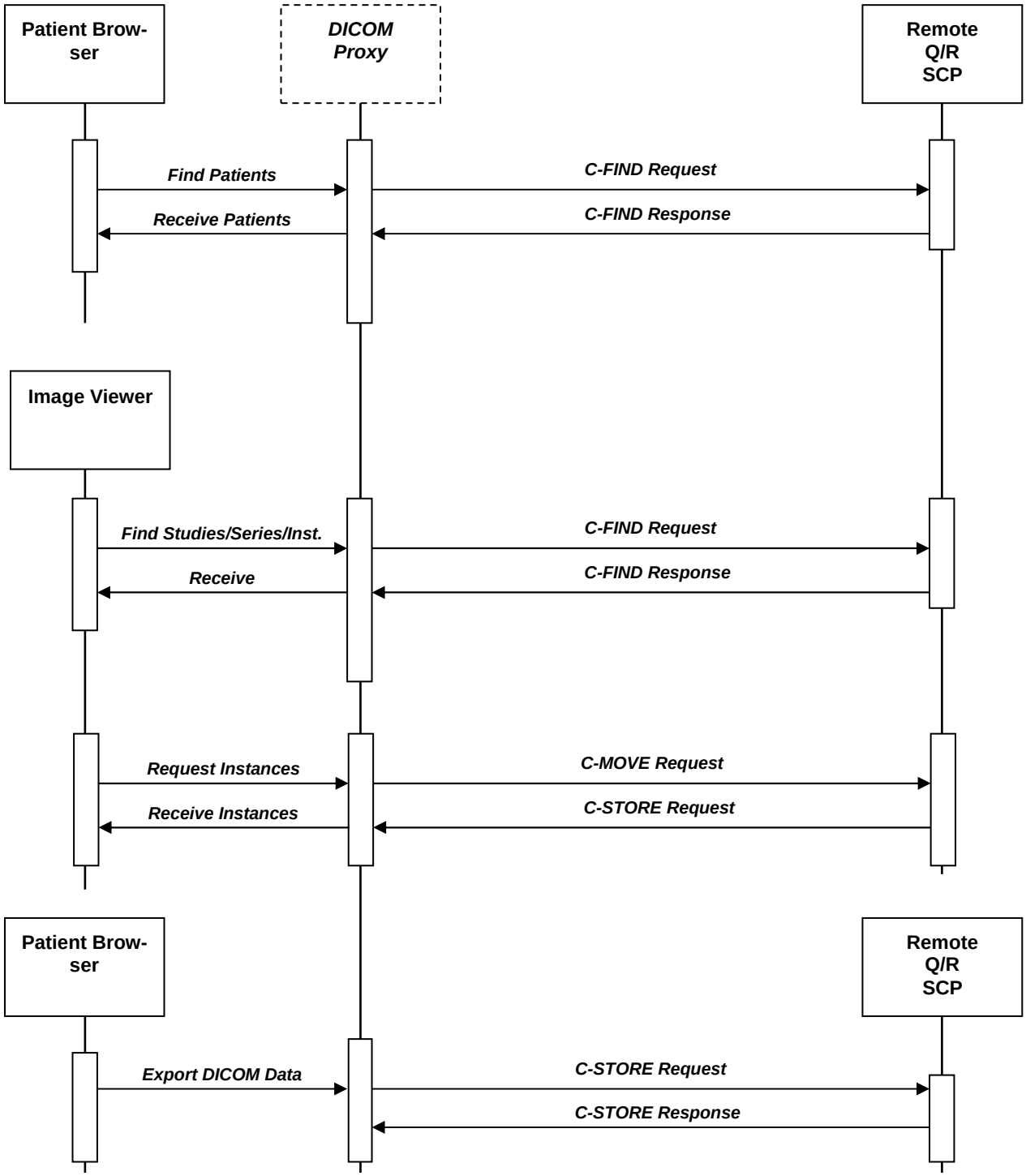
Figure 4-2: Image Viewer Application flow diagram

4.1.2 Functional Definition of Application Entity (AE)

Some communications and data transfer with remote AEs are accomplished utilizing the DICOM protocol over a network using the TCP/IP protocol stack.

- If the Image Viewer requests instances it accepts an association from the DICOM Proxy accepting any kind of DICOM objects which contain an image module or Segmentation instances.

4.1.3 Sequencing Of Real World Activities



Patient Data Manager is embedded in a sequencing of real world activities as follows:

1. *User queries for Patients via Patient Browser*
   a. DICOM Proxy uses C-FIND requests to find the patients
   b. Results are transferred to the Patient Browser
2. *ImageViewer is opened*
   a. ImageViewer queries for studies, series and instances
   b. Series are transferred upon user request or according to prefetching rules.
      i. DICOM Proxy uses C-MOVE requests to transfer the series.
      ii. DICOM Proxy receives C-STORE requests and forwards data to the Image Viewer
3. User exports DICOM data via Patient Browser
   a. An export request is sent to the DICOM Proxy
   b. The DICOM Proxy stores the data to a remote DICOM archive using C-STORE requests

4.2 Application Entity Specifications

4.2.1 Patient Browser

4.2.1.1 SOP Classes and Transfer Syntaxes

The Patient Browser queries the Proxy using the Brainlab Workflow Services.
The Proxy forwards the queries using the following standard DICOM Service Class:

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	No

4.2.1.2 Association Policies

4.2.1.2.1 Implementation Identifying Information

The implementation information for this Application Entity is:

Implementation Class UID	1.2.276.0.20.1.1.33.3.0.1
Implementation Version Name	PatientSelect3.0

4.2.1.3 Association Initiation Policy

The Patient Browser initiates an association in these cases:

1. Search for a Patient: The user searches for a patient for further treatment.
2. Export DICOM Data: The user exports DICOM data to a remote DICOM Archive

4.2.1.3.1 Activity – Search for a Patient

4.2.1.3.1.1 Associated Real-World Activity

The user want to select a patient for further treatment. The Patient Browser contacts the DICOM Proxy to give it a list of patients which match the specified filter criteria. The Proxy forwards the request to an associated Q/R server. Please refer to the DICOM Proxy's conformance statement for the Proposed Presentation Contexts and SOP Specific Conformance.

4.2.1.4 Association Acceptance Policy

The Patient Browser accepts no associations.

4.2.2 Image Viewer Specification

4.2.2.1 SOP Classes and Transfer Syntaxes

The Image Viewer queries and retrieves instances from the Proxy using the Brainlab Workflow Services.

The Image Viewer imports DICOM image data. It provides Standard Conformance to the following DICOM V3.0 SOP Classes:

SOP Class Name	SOP Class UID	SCU	SCP	Transfer Syntax
Enhanced CT Image	1.2.840.10008.5.1.4.1.1.2.1	No	Yes	COMP
Enhanced MR Image	1.2.840.10008.5.1.4.1.1.4.1	No	Yes	COMP
SC Multi Frame Grayscale Byte	1.2.840.10008.5.1.4.1.1.7.2	No	Yes	COMP
SC Multi Frame Grayscale Word	1.2.840.10008.5.1.4.1.1.7.3	No	Yes	COMP
SC Multi Frame Single Bit	1.2.840.10008.5.1.4.1.1.7.1	No	Yes	COMP
SC Multi Frame True Color	1.2.840.10008.5.1.4.1.1.7.4	No	Yes	LOSSY
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	No	Yes	RLE
Standard CR	1.2.840.10008.5.1.4.1.1.1	No	Yes	COMP
Standard CT	1.2.840.10008.5.1.4.1.1.2	No	Yes	COMP
Standard Digital X-Ray Image for Image for Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes	COMP
Standard Digital X-Ray Image for Image for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	No	Yes	COMP
Standard Grayscale Softcopy Image for Presentation State	1.2.840.10008.5.1.4.1.1.11.1	No	Yes	COMP
Standard Hardcopy Color	1.2.840.10008.5.1.1.30	No	Yes	COMP
Standard Hardcopy Grayscale	1.2.840.10008.5.1.1.29	No	Yes	COMP
Standard Intra-oral X-Ray Image for Presentation	1.2.840.10008.5.1.4.1.1.1.3	No	Yes	UNCOMP
Standard Intra-oral X-Ray Image for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes	UNCOMP
Standard MG Image for Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes	COMP
Standard MG Image for Processing	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes	COMP
Standard MR	1.2.840.10008.5.1.4.1.1.4	No	Yes	COMP

SOP Class Name	SOP Class UID	SCU	SCP	Transfer Syntax
Standard NM	1.2.840.10008.5.1.4.1.1.20	No	Yes	COMP
Standard NM Retired	1.2.840.10008.5.1.4.1.1.5	No	Yes	COMP
Standard Ophthalmic 16 Bit	1.2.840.10008.5.1.4.1.1.77.1.5.2	No	Yes	COMP
Standard Ophthalmic 8 Bit	1.2.840.10008.5.1.4.1.1.77.1.5.1	No	Yes	COMP
Standard PET	1.2.840.10008.5.1.4.1.1.128	No	Yes	COMP
Standard RT Image	1.2.840.10008.5.1.4.1.1.481.1	No	Yes	COMP
Standard Secondary Capture	1.2.840.10008.5.1.4.1.1.7	No	Yes	COMP
Standard US	1.2.840.10008.5.1.4.1.1.6.1	No	Yes	COMP
Standard US Multi Frame	1.2.840.10008.5.1.4.1.1.3.1	No	Yes	COMP
Standard US Multi Frame Retired	1.2.840.10008.5.1.4.1.1.3	No	Yes	COMP
Standard US Retired	1.2.840.10008.5.1.4.1.1.6	No	Yes	UNCOMP
Standard Video Endoscopic	1.2.840.10008.5.1.4.1.1.77.1.1.1	No	Yes	COMP
Standard Video Microscopic	1.2.840.10008.5.1.4.1.1.77.1.2.1	No	Yes	COMP
Standard Video Photographic	1.2.840.10008.5.1.4.1.1.77.1.4.1	No	Yes	COMP
Standard VL Endoscopic	1.2.840.10008.5.1.4.1.1.77.1.1	No	Yes	COMP
Standard VL Microscopic	1.2.840.10008.5.1.4.1.1.77.1.2	No	Yes	COMP
Standard VL Photographic	1.2.840.10008.5.1.4.1.1.77.1.4	No	Yes	COMP
Standard VL Slide Microscopic	1.2.840.10008.5.1.4.1.1.77.1.3	No	Yes	UNCOMP
Standard X-Ray Angio	1.2.840.10008.5.1.4.1.1.12.1	No	Yes	COMP
Standard X-Ray Angio Biplane	1.2.840.10008.5.1.4.1.1.12.3	No	Yes	COMP
Standard X-Ray RF	1.2.840.10008.5.1.4.1.1.12.2	No	Yes	COMP

Table 4-1: Supported Storage SOP Classes

Patient Data Manager supports the following transfer syntax lists. In an association negotiation the syntaxes are proposed in the order of appearance in the list.

Transfer Syntax Name	Transfer Syntax UID	SCU	SCP	Extended Negotiation
Uncompressed Transfer Syntax List (UNCOMP)				
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes	None
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	Yes	Yes	None
DICOM Implicit VR Little Endian	1.2.840.10008.1.2	Yes	Yes	None
Compressed Transfer Syntax List (COMP)				
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes	None
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	Yes	Yes	None
DICOM Implicit VR Little Endian	1.2.840.10008.1.2	Yes	Yes	None
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14)	1.2.840.10008.1.2.4.70	Yes	Yes	None
RLE Lossless	1.2.840.10008.1.2.5	Yes	Yes	None
RLE Transfer Syntax List (RLE)				
RLE Lossless	1.2.840.10008.1.2.5	Yes	Yes	None

DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes	None
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	Yes	Yes	None
DICOM Implicit VR Little Endian	1.2.840.10008.1.2	Yes	Yes	None
Only Implicit Transfer Syntax List (IMPL)				
DICOM Implicit VR Little Endian	1.2.840.10008.1.2	Yes	Yes	None
JPEG Lossy Transfer Syntax List (LOSSY)				
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes	None
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	Yes	Yes	None
DICOM Implicit VR Little Endian	1.2.840.10008.1.2	Yes	Yes	None
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	Yes	Yes	None

Table 4-2: Supported Transfer Syntaxes

4.2.2.2 Association Policies

4.2.2.2.1 Implementation Identifying Information

The implementation information for this Application Entity is:

Implementation Class UID	1.2.276.0.20.1.1.31.1.0.1
Implementation Version Name	ImageViewer1.0

4.2.2.3 Association Initiation Policy

The Image Viewer initiates an association in these cases:

1. Find studies, series and instances: Gives the user an overview of the available DICOM data for the selected patient.
2. Retrieve Instances: Transfers the Instances to the ImageViewer for viewing and further treatment.

4.2.2.3.1 Activity – Find studies, series and instances

4.2.2.3.1.1 Associated Real-World Activity

The ImageViewer queries the list of studies of the selected immediately after the start. If a study is not older than a specified date or the study is selected manually by the user, the series and instance information are also queried. Please refer to the DICOM Proxy's conformance statement for the Proposed Presentation Contexts and SOP Specific Conformance.

4.2.2.3.2 Activity – Retrieve Instances

4.2.2.3.2.1 Associated Real-World Activity

The ImageViewer retrieves a number of ImageSeries automatically if they match the configured prefetch rules. Further image series are retrieved on users request. Please refer to the DICOM Proxy's conformance statement for the Proposed Presentation Contexts and SOP Specific Conformance.

4.2.2.4 Association Acceptance Policy

The ImageViewer accepts no associations.

5 Media Interchange

Patient Data Manager supports DICOM media interchange for import and export of DICOM data:

- For import Patient Data Manager supports media interchange application profiles. To reflect this, the support for the Standard General Purpose CD-R Interchange and the General Purpose DVD with Compression Interchange is added to provide the supported SOP Classes. Nevertheless Patient Data Manager is able to import DICOM files even without the existence of any DICOMDIR by scanning a given file system located on any media (e.g. HD, MOD, CD, DVD, Tapes, USB Drive) for any kind of DICOM files.
- For export Patient Data Manager supports the Standard General Purpose CD-R Interchange and the General Purpose DVD with Compression Interchange Profile.

5.1 Implementation Model

5.1.1 Application Data Flow Diagram

With Patient Data Manager the user may browse DICOM file sets and import selected entities.

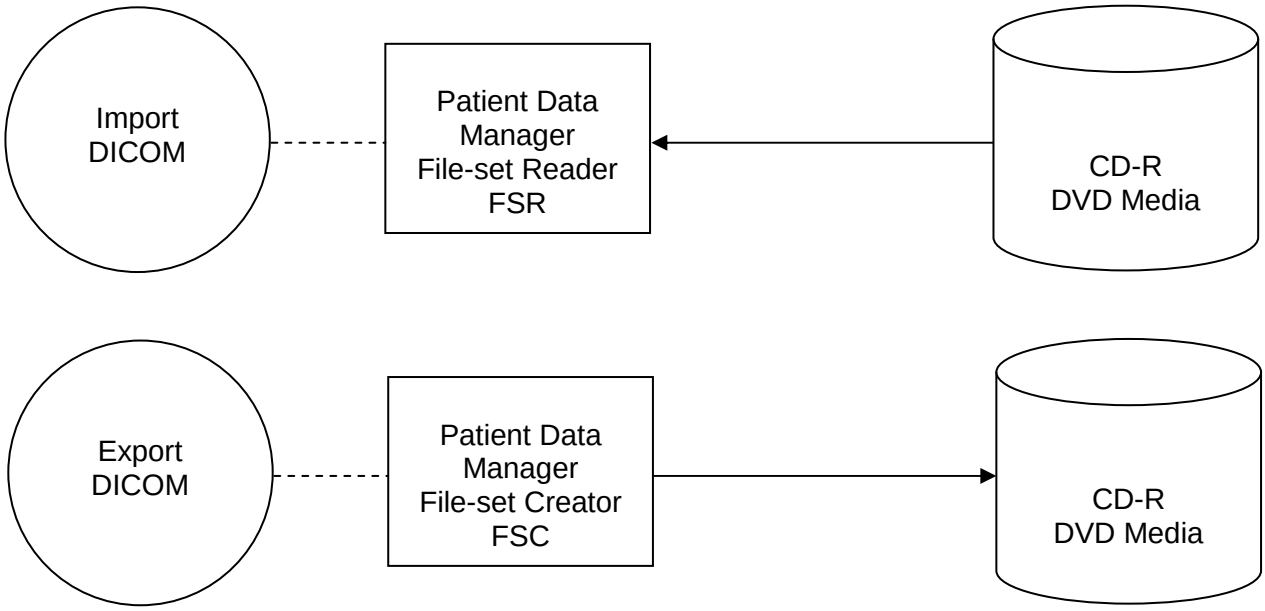


Figure 5-1: The media interchange application flow diagram

5.1.2 Functional Definition of Application Entity (AE)

Some communications and data transfer with remote AEs are accomplished utilizing the file system provided by the operating system upon which Patient Data Manager executes.

- File Set Reader:
  Patient Data Manager loads DICOM data from the file. The reader supports the same SOP classes as the Storage SCP (see Table 4-1).

- File Set Creator:
  Upon request, the Patient Data Manager can export DICOM data to CD-R or to a DVD Media.

5.1.3 Sequencing Of Real World Activities

Not necessary.

5.1.4 File Meta Implementation Identifying Information

Patient Data Manager provides the same information as in chapter 4.2.1.2.1.

5.2 Application Entity Specifications

Patient Data Manager supports the following Media Interchange Profiles:

AE Related Application Profiles, Real-World Activities, and Roles			
Supported APs	**Real World Activity**	**Roles**	**SC Option**
STD-GEN-CD	Import/Export DICOM	FSR/FSC	Interchange
STD-GEN-DVD-JPEG	Import/Export DICOM	FSR/FSC	Interchange

Table 5-1: Supported Media Interchange Profiles.

5.2.1.1 File Meta Information for the Application Entity

The Source Application Entity Title included in the File Meta Header is configurable. It is the same as the local AET of the network configuration (see section **Error! Reference source not found.**)

5.2.1.2 Real-World Activities

5.2.1.2.1 Activity – Import DICOM

Patient Data Manager acts as an FSR using the Interchange option

- When requested to provide a directory listing it will read the File-set and display the DICOMDIR directory entries for all SOP Instances in the File-set.
- When requested to import the selected entries from directory listing, only those SOP Instances are loaded that correspond to the Application Profile STD-GEN-CD.
- For the list of Application Profiles invoking this AE see Table 5-1. The supported SOP Classes see Table 4-1.

5.2.1.2.1.1 Media Storage Application Profiles

Patient Data Manager supports the STD-GEN-CD Application Profile.

5.2.1.2.1.2 Options

Supported transfer syntaxes for the media profiles:

Transfer Syntax Name	Transfer Syntax UID
DICOM Implicit VR Little Endian	1.2.840.10008.1.2
DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2
JPEG Baseline (Process 1): Default Transfer Syntax for Lossy JPEG 8 Bit Image Compression	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4): Default Transfer Syntax for Lossy JPEG 12 Bit Image Compression (Process 4 only)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1]): Default Transfer Syntax for Lossless JPEG Image Compression	1.2.840.10008.1.2.4.70
RLE Lossless	1.2.840.10008.1.2.5

Table 5-2: Supported Media Profile Transfer Syntaxes

The Patient Data Manager supports the SOP Classes and Transfer Syntaxes listed in the Table below:

SOP Classes	Transfer Syntaxes
All SCP SOP Classes listed in Table 4-1	All SCP Transfer Syntaxes listed in Table 5-2

For further information see section 8.1.2 on acceptance of SOP Instances (i.e. whether Patient Data Manager is able to import and convert the DICOM data).

5.2.1.2.2 Activity – Export DICOM

The user selects DICOM series or entire studies for export. The contents will be written together with a corresponding DICOMDIR to a single session media. Writing in multi session is not supported.

5.2.1.2.2.1 Media Storage Application Profiles

The Patient Data Manager supports the STD-GEN-CD and the STD-GEN-DVD-JPEG application profile. Even though the STD-GEN-CD profile specifies all instances to be stored in an uncompressed transfer syntax, the instances are written in the same transfer syntax as they are stored on the DICOM Proxy. This means that a STD-GEN-CD can contain all transfer syntaxes specified in Table 5-2.

5.2.1.2.2.2 Options

Supported transfer syntaxes for the media profiles: see Table 5-2.
The Patient Data Manager supports the SOP Classes and Transfer Syntaxes listed in the Table below:

SOP Classes	Transfer Syntaxes
All SCP SOP Classes listed in Table 4-1	All SCP Transfer Syntaxes listed in Table 5-2

5.3 Augmented And Private Application Profiles

Patient Data Manager does not support any augmented or private application profiles.

6 Support Of Extended Character Sets

Patient Data Manager supports the

- ISO_IR 100 (ISO 8859-1:1987 Latin Alphabet No. 1 supplementary set)

7 Security Profiles

No security profiles are supported.

8 Annexes

8.1 IOD Contents

8.1.1 Created SOP Instances

The following tables use a number of abbreviations. The abbreviations used in the “Presence of Module” column are:

MNAP	Module not always present
ALWAYS	Module always present
NEVER	Module never present

8.1.1.1 Multiframe True Color Secondary Capture Image

IE	Module	Reference	Presence of Module
Patient	Patient	8.1.1.2.1	ALWAYS
	Clinical Trial Subject		NEVER
Study	General Study	8.1.1.2.2	ALWAYS
	Patient Study		NEVER
	Clinical Trial Study		NEVER
Series	General Series	8.1.1.2.3	ALWAYS
	Clinical Trial Series		NEVER
Frame of Reference	Frame of Reference		NEVER
	Synchronization		NEVER
Equipment	General Equipment	8.1.1.2.4	ALWAYS
	SC Equipment	8.1.1.2.5	ALWAYS
Image	General Image	8.1.1.2.6	ALWAYS
	Image Pixel	8.1.1.2.7	ALWAYS
	Cine		NEVER
	Multi-frame	8.1.1.2.8	ALWAYS
	Frame Pointers		NEVER
	Device		NEVER
	Multi-frame Functional Groups		NEVER
	Multi-frame Dimension		NEVER
	Specimen		NEVER
	SC Image		NEVER
	SC Multi-frame Image	8.1.1.2.9	ALWAYS
	SC Multi-frame Vector		NEVER
	ICC Profile		NEVER
	SOP Common	8.1.1.2.10	ALWAYS
	Frame Extraction		NEVER

8.1.1.2 Created Modules

The following tables use a number of abbreviations. The abbreviations used in the “Presence” column are:

VNAP	Value not always present (attribute set to zero length if no value is present)

ANAP	Attribute not always present
ALWAYS	Attribute is always present
EMPTY	Attribute is set to zero length

The abbreviations used in the “Source” column:

USER	The attribute value source is from user input
AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter

8.1.1.2.1 Patient

Attribute Name	Tag	VR	Value	Presence	Source
Patient's Name	(0010,0010)	PN	From loaded data or entered by the user	VNAP	AUTO/USER
Patient ID	(0010,0020)	LO	From loaded data or entered by the user	VNAP	AUTO/USER
Patient's Birth Date	(0010,0030)	DA	From loaded data or entered by the user	VNAP	AUTO/USER
Patient's Sex	(0010,0040)	CS	From loaded data or entered by the user	VNAP	AUTO/USER

Table 8-1: Patient Module

8.1.1.2.2 General Study

Attribute Name	Tag	VR	Value	Presence	Source
Study Instance UID	(0020,000D)	UI	Generated	ALWAYS	AUTO
Study Date	(0008,0020)	DA	Generated: <CurrentDate>	ANAP	AUTO
Referring Physician's Name	(0008,0090)	PN	Unknown^Unknown	ALWAYS	AUTO
Study ID	(0020,0010)	SH	Generated: <PatientID>-<GeneratedId>	ALWAYS	AUTO
Accession Number	(0008,0050)	SH	ACC-<Study ID>	ALWAYS	AUTO
Study Description	(0008,1030)	LO	"Screenshots and Documenta-tion"	ANAP	AUTO

Table 8-2: General Study Module

8.1.1.2.3 General Series

Attribute Name	Tag	VR	Value	Presence	Source
Series Instance UID	(0020,000E)	UI	Generated	ALWAYS	AUTO
Series Date	(0008,0021)	DA	Generated: <CurrentDate>	ALWAYS	AUTO
Series Time	(0008,0031)	TM	Generated: <CurrentTime>	ALWAYS	AUTO
Series Description	(0008,103E)	LO	"Screenshots"	ALWAYS	AUTO
Patient Position	(0018,5100)	CS		EMPTY	AUTO

Table 8-3: General Series Module

8.1.1.2.4 General Equipment

Attribute Name	Tag	VR	Value	Presence	Source
Manufacturer	(0008,0070)	LO		EMPTY	AUTO

Table 8-4: (Enhanced) General Equipment Module

8.1.1.2.5 SC Equipment

Attribute Name	Tag	VR	Value	Presence	Source
Conversion Type	(0008,0064)	CS	"WSD"	ALWAYS	AUTO
Modality	(00008,0060)	CS	"OT"	ALWAYS	AUTO

Table 8-5: SC Equipment Module

8.1.1.2.6 General Image

Attribute Name	Tag	VR	Value	Presence	Source
Instance Number	(0020,0013)	IS	Generated	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Generated: <Current Date>	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Generated: <Current Time>	ALWAYS	AUTO

Table 8-6: General Image Module

8.1.1.2.7 Image Pixel

Attribute Name	Tag	VR	Value	Presence	Source
Samples per Pixel	(0028,0002)	US	"3"	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	"YBR_FULL_422" for compressed images, "RGB" otherwise	ALWAYS	AUTO
Rows	(0028,0010)	IS	Generated	ALWAYS	AUTO
Columns	(0028,0011)	DA	Generated	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	"8"	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	"8"	ALWAYS	AUTO
High Bit	(0028,0102)	US	"7"	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	"0"	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	"0"	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB	Generated	ALWAYS	AUTO

Table 8-7: Image Pixel Module

8.1.1.2.8 Multi-frame

Attribute Name	Tag	VR	Value	Presence	Source
Number of Frames	(0028,0008)	US	"1"	ALWAYS	AUTO

Table 8-8: Multi-frame Module

8.1.1.2.9 SC Multi-frame Image

Attribute Name	Tag	VR	Value	Presence	Source
Burned In Annotations	(0028,0301)	CS	"NO"	ALWAYS	AUTO

Table 8-9: SC Multi-frame Image Module

8.1.1.2.10 SOP Common

Attribute Name	Tag	VR	Value	Presence	Source
SOP Class UID	(0008,0016)	DS	IOD specific	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	DS	Generated	ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA	Generated: <CurrentDate>	ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM	Generated: <CurrentTime>	ALWAYS	AUTO

Table 8-10: SOP Common Module

8.1.2 Usage Of Attributes From Received IODs

This section describes the requirements on the DICOM data, which can be displayed.

8.1.2.1 Images

Patient Data Manager accepts all images of the SOP Classes in Table 4-1. Though, there are some restrictions and special conversions:

- Images with an attribute (0028,0030) Pixel Spacing containing different values for x and y distance[1] will be ignored.

8.1.2.2 Segmentation Storage

Patient Data Manager accepts the Segmentation Storage SOP Class. Though, there are some restrictions:

- Segmentation Storage objects with Segmentation Type (0060,3020) "BINARY" are not supported if the value of the Columns attribute (0028, 0011) is not a multiple of 8.

8.2 Data Dictionary Of Private Attributes

None supported.

8.3 Coded Terminology And Templates

None supported.

8.4 Grayscale Image Consistency

Not supported.

8.5 Standard Extended/Specialized/Private Sop Classes

None supported.

8.6 Private Transfer Syntaxes

None supported.

[1] To be more precise: If the difference between both values is greater than 0.001 mm.

9 Indexes

9.1 Index Of Tables

9.2 Index Of Figures