DICOM Conformance Statement

Interventional Tools 9.0

For products :
Interventional Work Spot 1.2.0
Allura 3DRA 6.4.0
Allura 3DCA 3.0.5
XperGuide 1.1.0
XperCT 3.2.0
StentBoost 4.2.0
CT TrueView 2.0.5
HeartNavigator 2.0.0
2D Perfusion 1.1.0
3D Roadmap 1.1.1
MR-CT Roadmap 1.1.1
Embo Guide 1.0.0

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1. DICOM Conformance Statement Overview

This conformance statement describes the 'Interventional Workstation', which is a combination of one or more of the following products:

- Interventional Work Spot 1.2.0
- Allura 3DRA 6.4.0
- Allura 3DCA 3.0.5
- XperGuide 1.1.0
- XperCT 3.2.0
- StentBoost 4.2.0
- CT TrueView 2.0.5
- HeartNavigator 2.0.0
- 2D Perfusion 1.1.0
- 3D Roadmap 1.1.1
- MR-CT Roadmap 1.1.1
- Embo Guide 1.0.0

These products are dedicated, high performance applications, which extend the functionality of compatible X-Ray equipment. Collectively, they are called the ‘Interventional Tools’. Since this document is workstation-centric (rather than tool-centric), we use the term ‘Interventional Workstation’ in this document.
Interventional Workstation is interoperable with systems providing a DICOM interface. Clinical users can select patient image data for basic viewing; post processing, data transfer or print. Interventional Workstation stores medical data in its local storage. The local storage has a limited capacity and is not intended for long term archiving purposes.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	**UID**			
Other				
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes	N/A
Print Management				
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No	N/A
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No	N/A
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No	N/A
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No	N/A
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No	N/A
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No	N/A
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No	N/A
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No	N/A
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No	N/A
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No	N/A
Query/Retrieve				
Patient Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes	N/A
Patient Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes	N/A
Study Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes	N/A
Study Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes	N/A
PatientStudy Only QR Info. Model – FIND SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.1	Yes	No	N/A
PatientStudy Only QR Info. Model – MOVE SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.2	Yes	No	N/A
Transfer				
Philips Private Grayscale Softcopy Presentation State Storage	1.3.46.670589.2.2.1.1	Yes	Yes	N/A
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	Yes	Yes	N/A
Philips Private Xray MF Image	1.3.46.670589.7.8.1618510091	Yes	Yes	N/A

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	**UID**			
Philips Private Stent Boost WorkItem	1.3.46.670589.7.8.16185100912	Yes	Yes	N/A
Philips Private Live Run WorkItems	1.3.46.670589.7.8.1618510092	Yes	Yes	N/A
Philips Private Run WorkItems	1.3.46.670589.7.8.16185100129	Yes	Yes	N/A
Philips Private Reco WorkItems	1.3.46.670589.7.8.16185100130	Yes	Yes	N/A
Philips Private Three DCA WorkItem	1.3.46.670589.7.8.16185100913	Yes	Yes	N/A
Embedded Document	1.3.46.670589.2.8.1.1	Yes	Yes	N/A
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes	N/A
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Yes	Yes	N/A
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes	N/A
Digital X-Ray Image Storage – For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes	N/A
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	Yes	N/A
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes	N/A
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	N/A
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes	N/A
Digital Mammography X-Ray Image Storage – Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes	N/A
Digital X-Ray Image Storage – For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes	N/A
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes	N/A
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes	N/A
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes	N/A
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes	N/A
Digital Mammography X-Ray Image Storage – Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes	N/A
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes	N/A
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes	N/A
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes	N/A
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes	N/A
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes	N/A
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes	N/A
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes	N/A
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes	N/A
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes	N/A
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes	N/A
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes	N/A
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes	N/A
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes	N/A
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes	N/A
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes	N/A
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes	N/A
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes	N/A
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes	N/A
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes	N/A
Enhanced SR SOP Class	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes	N/A
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes	N/A
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes	N/A
Hemodynamic Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes	N/A
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes	N/A
Ambulatory ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes	N/A
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes	N/A

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	**UID**			
Workflow Management				
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No	N/A

A table of Supported Media Storage Application Profiles (with roles) is provided.

Table 2: Media Services

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)
Compact Disk-Recordable			
General Purpose CD-R Interchange	Yes	No	Yes
DVD			
General Purpose DVD Interchange with JPEG	Yes	No	Yes
General Purpose DVD Interchange with JPEG 2000	Yes	No	Yes

2. Table of Contents

3. Introduction

3.1. Revision History

The revision history provides dates and differences of the different releases.

Table 3: Revision History

Document Version	Date of Issue	Status	Description
00	05-December-2013	Approved	

3.2. Audience

This Conformance Statement is intended for:

- (Potential) customers
- System integrators of medical equipment
- Marketing staff interested in system functionality
- Software designers implementing DICOM interfaces

It is assumed that the reader is familiar with the DICOM standard.

3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.
This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**
  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.
  It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**
  Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery. The user should ensure that any non-Philips provider linking to Philips equipment also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

3.4. Definitions, Terms and Abbreviations

Table 4: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
ANSI	American National Standard Institute
AP	Application Profile
BOT	Basic Offset Table
CD	Compact Disc
CD-R	CD-Recordable
CD-M	CD-Medical
CR	Computed Radiography
CT	Computed Tomography
DCR	Dynamic Cardio Review
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DX	Digital X-Ray
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
GUI	Graphic User Interface
HIS	Hospital Information System
HL7	Health Level Seven
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
ISIS	Information System – Imaging System
MOD	Magneto-Optical Disk
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDU	Protocol Data Unit
RF	X-Ray Radiofluoroscopic
RIS	Radiology Information System
RT	Radiotherapy
RWA	Real-World Activity
SC	Secondary Capture
SCM	Study Component Management
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
USMF	Ultrasound Multi-frame
WLM	Worklist Management
XA	X-Ray Angiographic

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 – 20 (NEMA PS 3.1- PS 3.20),
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1752 Rosslyn, Virginia. 22209, United States of America
Internet: http://medical.nema.org/

Note that at any point in time the official standard consists of the most recent yearly edition of the base standard (currently 2011) plus all the supplements and correction items that have been approved as Final Text.

4. Networking

This section contains the networking related services (vs. the media related ones).

4.1. Implementation model

The implementation model consists of three sections:

- The application data flow diagram, specifying the relationship between the Application Entities and the “external world” or Real-World Activities,
- A functional description of each Application Entity, and
- The sequencing constraints among them.

4.1.1. Application Data Flow

The Interventional Workstation implements one network application entity: the Interventional workstation Network AE.
The following figure shows the networking application data flow as a functional overview of the application entity. On the left the local Real-World Activities are presented, whereas on the right the remote Real-World Activities are presented.

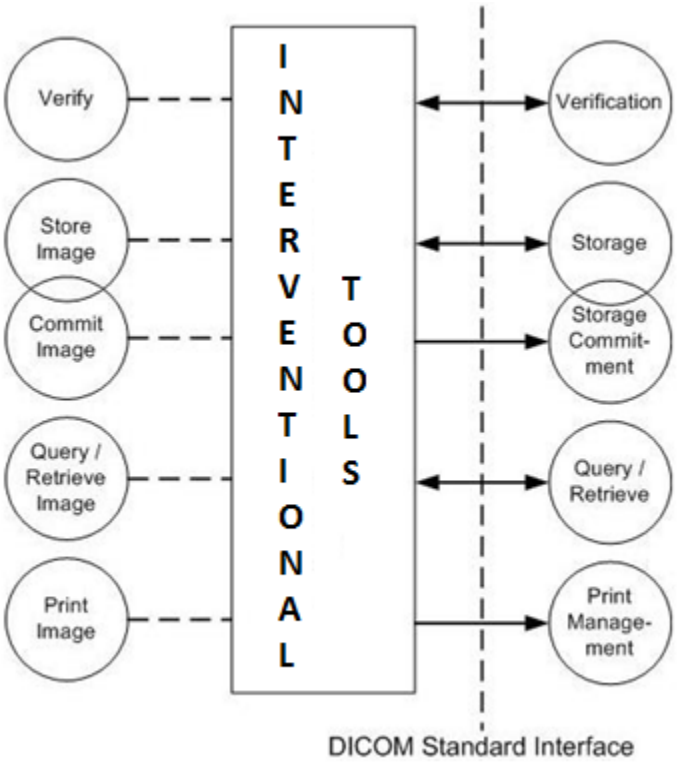

Figure 1: Application Data Flow Diagram

The Interventional Workstation incorporates the following functionality:
- Import images to a local database;
- Export (and commit) images from the local database to a network DICOM node;
- Query and retrieve images from a remote DICOM node;
- Query and retrieve images from the local database;
- Print grayscale and color images from the local database on a DICOM printer.

4.1.2. Functional Definition of AE’s

This section contains a functional definition for each individual local Application Entity.

4.1.2.1. Functional Definition of Interventional Workstation Network AE

Interventional Workstation incorporates the following functionality:

- The Interventional Workstation Network AE can verify application level communication by using the Verification service both as SCU and SCP (Verify).
- The Interventional Workstation Network AE can store images by using the Storage service both as SCU and SCP (Store Image).
- The Interventional Workstation Network AE can commit images by using the Storage Commitment service as SCU (Commit Image).
- The Interventional Workstation Network AE can find and move images by using the Query/Retrieve service both as SCU and SCP (Query/Retrieve Image).
- The Interventional Workstation Network AE can print images by using the Print Management service as SCU (Print Image).

4.1.3. Sequencing of Real World Activities

4.1.3.1. Sequencing of Query/Retrieve Activity

The Interventional workstation can Query DICOM archives and Receive images locally. An association is established when the user initiates a query from the graphical user interface. The Interventional Workstation's Query/Retrieve SCU will establish an association to query a remote AE to obtain a list of relevant objects based on the user's inputs.
When the user retrieves the needed objects, the remote AE establishes a connection with the Interventional Workstation's Storage SCP to store the images locally.

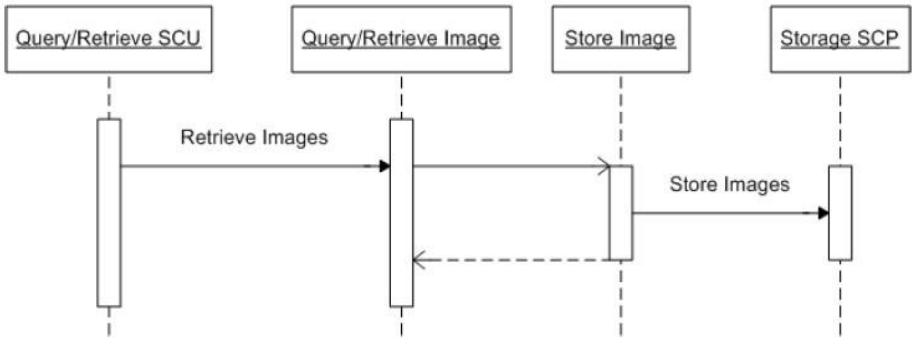

Figure 2: Sequencing of Query/Retrieve

4.1.3.2. Sequencing of Storage Commitment Activity

The Interventional Workstation will request for storage commitment if the remote node has been configured with the 'Is Archive' flag checked in the configuration. The storage commit is done after each Study is transferred.

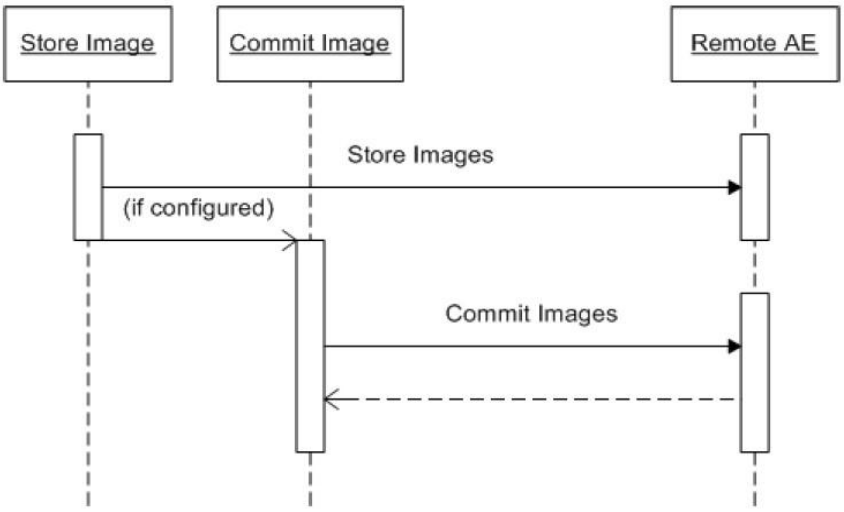

Figure 3: Sequencing of Storage Commitment

4.2. AE Specifications

This section in the DICOM Conformance Statement is a set of Application Entity specifications. There are as many of these subsections as there are different AE's in the implementation.

4.2.1. Interventional Workstation Network AE

Detail of this specific Application Entity is specified in this section.

4.2.1.1. SOP Classes

This Application Entity provides Standard Conformance to the following SOP Classes.

Table 5: SOP Classes for Interventional Workstation Network AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Philips Private Grayscale Softcopy Presentation State Storage	1.3.46.670589.2.2.1.1	Yes	Yes
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	Yes	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Digital X-Ray Image Storage – For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
Digital X-Ray Image Storage – For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Digital Mammography X-Ray Image Storage – Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Patient Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes
Digital Mammography X-Ray Image Storage – Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Patient Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Study Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
Study Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
Enhanced SR SOP Class	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Hemodynamic Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Ambulatory ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

Note: Any SOP specific behavior is documented later in the conformance statement in the applicable SOP specific conformance section.

4.2.1.2. Association Policies

Each AE specification contains a description of the general association establishment and acceptance policies of the AE.

4.2.1.2.1. General

The DICOM standard application context is specified below.

Table 6: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2. Number of Associations

The number of simultaneous associations that an Application Entity may support as an Initiator or Acceptor is specified here.

Table 7: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	Configurable

Table 8: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous associations	10

4.2.1.2.3. Asynchronous Nature

The implementation supports negotiation of multiple outstanding transactions, along with the maximum number of outstanding transactions supported.
The Interventional Workstation Network AE does not support asynchronous operations and will not perform asynchronous window negotiation. The only exceptions are for reports from Storage Commitment and Print Management operations.

Table 9: Asynchronous nature as an Association Initiator for this AE

Description	Value
Maximum number of outstanding asynchronous transactions	Not applicable

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are documented here.

Table 10: DICOM Implementation Class and Version for Interventional Workstation Network AE

Implementation Class UID	1.3.46.670589.7.8.1.2
Implementation Version Name	1.2.0

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in the next table.

Table 11: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	The association setup fails; the reason is logged and reported to the user.

4.2.1.3. Association Initiation Policy

The Application Entity will respond to a received Association rejection as shown in the next table.

Table 12: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 – rejected-permanent	1 – DICOM UL service-user	1 – no-reason-given	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent,1: REJECT_SOURCE_dul_user,1: REJECT_REASON_no_reason_given)
		2 – application-context-name-not supported	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 2: REJECT_REASON_application_context_not_support)
		3 – calling-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON_calling_aetitle_not_recognized)
		7 – called-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON_called_aetitle_not_recognized)

Result	Source	Reason/Diagnosis	Behavior
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	Association is not established. The following error is logged. Error: UserRecoverable: impl.dicom.access.PEER: Associationrejected by peer (1: REJECT_RESULT_permanent, 2: REJECT_SOURCE_dul_provider (acse), 1: REJECT_REASON_no_reason_given)
		2 – protocol-version-not-supported	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 2: REJECT_SOURCE_dul_provider (acse), 2: REJECT_REASON_application_context_not_support)
	3 – DICOM UL service-provider(Presentation related function)	1 – temporary-congestion	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 3: REJECT_SOURCE_dul_provider (presentation), 1: REJECT_REASON_no_reason_given)
		2 – local-limit-exceeded	Association is not established. The following error is logged. Association rejected by peer (1: REJECT_RESULT_permanent, 3: REJECT_SOURCE_dul_provider (presentation), 2: REJECT_REASON_application_context_not_support)
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 1: REJECT_REASON_no_reason_given)
		2 – application-context-name-not-supported	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 2: REJECT_REASON_application_context_not_support)
		3 – calling-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 3: REJECT_REASON_calling_aetitle_not_recognized)
		7 – called-AE-title-not-recognized	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 1: REJECT_SOURCE_dul_user, 7: REJECT_REASON_called_aetitle_not_recognized)
	2 – DICOM UL service-provider (ACSE related function)	1 – no-reason-given	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 2: REJECT_SOURCE_dul_provider (acse), 1: REJECT_REASON_no_reason_given)
		2 – protocol-version-not-supported	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 2: REJECT_SOURCE_dul_provider (acse), 2: REJECT_REASON_application_context_not_support)
	3 – DICOM UL service-provider (Presentation related function)	1 – temporary-congestion	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 3: REJECT_SOURCE_dul_provider (presentation), 1: REJECT_REASON_no_reason_given)
		2 – local-limit-exceeded	Association is not established. The following error is logged. Association rejected by peer (2: REJECT_RESULT_transient, 3: REJECT_SOURCE_dul_provider (presentation), 2: REJECT_REASON_application_context_not_support)

The behavior of the AE on receiving an Association abort is summarized in the next table.

Table 13: Association Abort Handling

Source	Reason/Diagnosis	Behavior when received	Sent when
0 – DICOM UL service-user (initiated abort)	0- reason-not-specified	When received, the Interventional Workstation terminates the connection with the following log: Association ABORTED by peer (0: ABORT_SOURCE_dul_user, 0: ABORT_REASON_not_specified).	• N-EVENT-REPORT for printing received with status FAILURE. • Abort is issued to an executing job that utilizes this network connection (ExportNetwork/ ArchiveNetwork/DICOMCopy/DICOMMove) • Any other problem than ones specified for Interventional Workstation Network AE SCU in the rows below. (Examples: Problem while decoding the DICOM stream, SCU was unable to send the Response to SCP, Error writing to SCU stream).
2 – DICOM UL service-provider (initiated abort)	0 – reason-not-specified	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 0: ABORT_REASON_not_specified)	• There are problems in SCU/SCP role negotiation. • Any other problem than ones specified for Interventional Workstation Network AE SCU in the rows below. (Example: Problem while decoding the DICOM stream).
	1 – unrecognized-PDU	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 1: ABORT_REASON_unrecognized_pdu).	An unrecognized PDU type is received[4].
	2 – unexpected-PDU	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 2: ABORT_REASON_unexpected_pdu).	The received PDU type is not expected in the current state of connection[5].
	4 – unrecognized-PDU-parameter	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 4: ABORT_REASON_unrecognized_pdu_parameter).	An unrecognized Associate PDU item is received[1].
	5 – unexpected-PDU-parameter	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 5: ABORT_REASON_unexpected_pdu_parameter).	• One of the Associate PDU items is received more than once[2]. • One of the Associate PDU items is received unexpectedly[2].
	6 – invalid-PDU-parameter-value	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 6: ABORT_REASON_invalid_pdu_parameter).	• One of the Associate PDU items is received more than once[3]. • One of the Associate PDU items is not received[3]. • There is mismatch in the application context names between the SCU and the SCP. • Illegal Asynchronous Operations Window invoke value is received. • Illegal Asynchronous Operations Window perform value is received. • Unknown presentation context id is received. • Unknown abstract syntax is received. • The length or the format of a received PDU item is invalid.

Notes:

1. Associate PDU items that are recognized:
   - 0x10 APPLICATION CONTEXT
   - 0x20 PRESENTATION CONTEXT (RQ)

- 0x21 PRESENTATION CONTEXT (AC)
- 0x30 ABSTRACT SYNTAX
- 0x40 TRANSFER SYNTAX
- 0x50 USER INFO
- 0x51 MAXIMUM LENGTH
- 0x52 IMPLEMENTATION CLASS UID
- 0x53 ASYNCHRONOUS OPERATIONS WINDOW
- 0x54 SCP/SCU ROLE SELECTION
- 0x55 IMPLEMENTATION VERSION NAME
- 0x56 SOP CLASS EXTENDED NEGOTIATION

2. Associate PDU items for Unexpected-PDU parameter Received more than once:
- 0x10 APPLICATION CONTEXT (SCU, SCP)
- 0x30 ABSTRACT SYNTAX (SCU, SCP)
- 0x40 TRANSFER SYNTAX (SCU)

Received unexpectedly:
- 0x20 PRESENTATION CONTEXT (RQ) (SCU)

3. Associate PDU items for Invalid-PDU parameter value:
Received more than once (SCU, SCP):
- 0x50 USER INFO
- 0x51 MAXIMUM LENGTH
- 0x52 IMPLEMENTATION CLASS UID
- 0x53 ASYNCHRONOUS OPERATIONS WINDOW
- 0x55 IMPLEMENTATION VERSION NAME

Received illegally:
- 0x21 PRESENTATION CONTEXT (AC) (SCP)

PDU items not received:
- 0x10 APPLICATION CONTEXT (SCU, SCP)
- 0x20 PRESENTATION CONTEXT (RQ) (SCP)
- 0x21 PRESENTATION CONTEXT (AC) (SCU)
- 0x50 USER INFO (SCU, SCP)
- 0x30 ABSTRACT SYNTAX (SCU)
- 0x40 TRANSFER SYNTAX (SCU)
- 0x51 MAXIMUM LENGTH (SCU, SCP)
- 0x52 IMPLEMENTATION CLASS UID (SCU)

1. PDU types that are recognized:
   - 0x01 A-ASSOCIATE-RQ
   - 0x02 A-ASSOCIATE-AC
   - 0x03 A-ASSOCIATE-RJ
   - 0x04 P-DATA-TF
   - 0x05 A-RELEASE-RQ
   - 0x06 A-RELEASE-RP
   - 0x07 A-ABORT

1. Expected PDU's for following states:
   STATE_IDLE:
   - 0x01 A-ASSOCIATE-RQ
   - 0x02 A-ASSOCIATE-AC
   - 0x03 A-ASSOCIATE-RJ
   - 0x05 A-RELEASE-RQ

- 0x06 A-RELEASE-RP
STATE_ASSOCIATED:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x06 A-RELEASE-RP
STATE_ASSOCIATING (SCU):
- 0x01 A-ASSOCIATE-RQ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
STATE_RELEASING:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
STATE_WAIT_FOR_ASSOCIATE (SCP):
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
- 0x07 A-ABORT
STATE_WAIT_FOR_FINISH:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
STATE_WAIT_FOR_DISCONNECT:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
STATE_TIMED_OUT:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
- 0x07 A-ABORT

Table 14: DICOM Command Communication Failure Behavior

Exception	Behavior
Reply Time-out	The association is aborted using A-ABORT and command marked as failed. The reason is logged and reported to the user.

4.2.1.3.1. (Real-World) Activity – Verification as SCU

4.2.1.3.1.1. Description and Sequencing of Activities

The Interventional Workstation Network AE implements the Verification service class / Verification SOP class to verify application level communication.

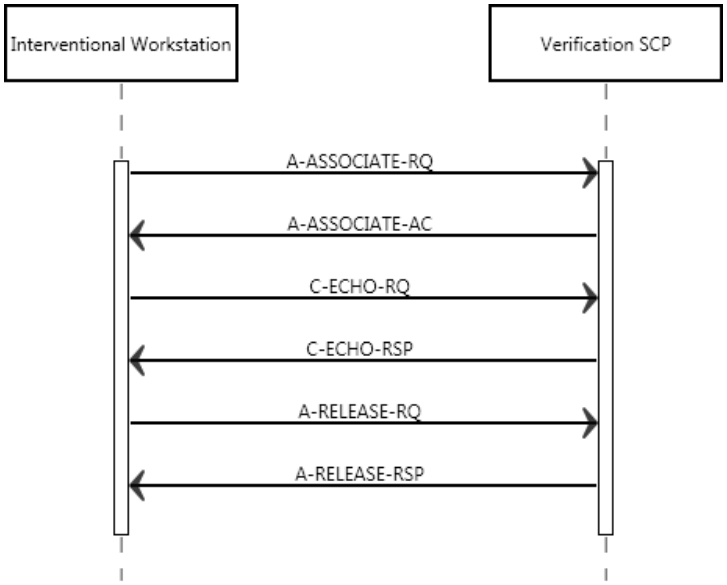

Figure 4: Data Flow Diagram – Verification as SCU

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 15: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.1.3. SOP Specific Conformance for Verification SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

The Interventional Workstation Network AE provides standard conformance to the DICOM Verification service class.

4.2.1.3.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 16: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	The SCP has successfully returned a verification response

4.2.1.3.2. (Real-World) Activity – FIND as SCU

4.2.1.3.2.1. Description and Sequencing of Activities

The Interventional Workstation implements the Query/Retrieve service class to find selected images per Query/Retrieve SCP. When querying a remote database the Interventional Workstation AE initiates an association to the selected peer entity, sends a C-FIND request and receives the related C-FIND responses. The association is released after specific time-out.

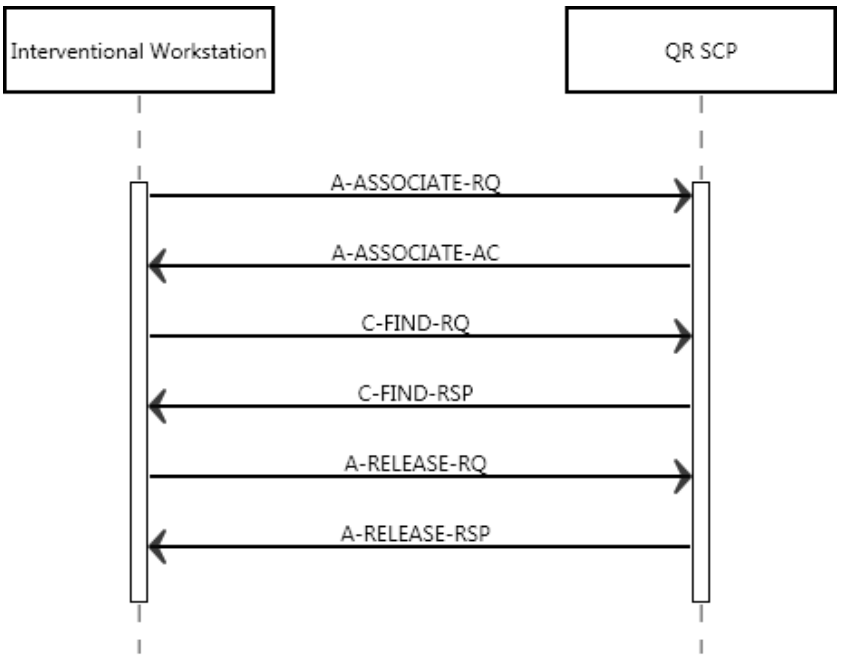

Figure 5: Data Flow Diagram – FIND as SCU

4.2.1.3.2.2. Proposed Presentation Contexts

The presentation contexts proposed by the system are defined in the next table.

Table 17: Proposed Presentation Contexts for (Real-World) Activity – FIND As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Patient Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Study Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.2.3. SOP Specific Conformance for Patient Root QR Information Model – FIND SOP Class

The Interventional Workstation Network AE provides standard conformance to the DICOM Query Retrieve service class. The system issues a C-FIND-RQ to a configured remote DIOCM node for matching studies. The received responses are displayed to the user. The user may retrieve the images from the remote node.

4.2.1.3.2.4. Dataset Specific Conformance for Patient Root QR Information Model – FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 18: Supported Query Keys for Patient Root Information Model

Patient Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	Single Value	
Q/R Patient level				
Patient ID	0010,0020	LO	Single Value, Universal, Wild card	
Patient's Name	0010,0010	PN	Single Value, Universal, Wild card	
Patient's Birth Date	0010,0030	DT	Universal	
Patient Sex	0010,0040	CS	Universal	
Q/R Study level				
Specific Character Set	0008,0005	CS		
Study Date	00080020	DA	Range, Single Value, Universal	
Study Time	0010,0010	TM	Universal matching	
Accession Number	0008,0050	SH	Single Value, Universal, Wild card	
Modalities in Study	0008,0061	CS	Single Value, Universal	
Referring Physician's Name	0008,0090	PN	Single Value, Universal	
Patient ID	0010,0020	LO	Single Value, Universal, Wild card	
Study Instance UID	0020,000D	UI	Universal matching	
Study ID	0020,0010	SH	Single Value, Universal	
Q/R Series level				
Specific Character Set	0008,0005	CS		
Series Date	0008,0021	DA	Single Value	
Series Time	0008,0031	TM	Single Value	
Modality	0008,0060	CS	Single Value, Universal, Wild card	
Related Series Sequence	0008,1250	SQ		
Philips private attribute	Mapped to :: 0008,1250	SQ		
Patient ID	0010,0020	LO	Single Value, Universal, Wild card	
Study Instance UID	0020,000D	UI	Single Value, Universal	
Series Instance UID	0020,000E	UI	Single Value	
Series Number	0020,0011	IS	Single Value, Universal	
Frame of Reference UID	0020,0052	UI	Single Value	
Philips private attribute	2001,0010	LO		Philips Imaging DD 001
Philips private attribute	2001,106E	SH		
Philips private attribute	2003,0020	LO		Philips X-ray Imaging DD 017
Philips private attribute	2003,2093	LO		
Philips private attribute	2003,2094	LO		
Philips private attribute	2003,2099	SH		

NOTE : A configuration template is available without the private attributes.

Table 19: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete – No final identifier is supplied	Successful completion of the query.
Failure	A700	Refused – Out of resources	Not enough resources; exception during evaluation of query.
	C000	Failed – Unable to process	Any other exception generated while evaluating the query.
Cancel	FE00	Matching terminated due to Cancel request	Query has been cancelled.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	Optional keys supported.

Service Status	Error Code	Further Meaning	Behavior
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	Optional keys not supported.

4.2.1.3.2.5. SOP Specific Conformance for Study Root QR Information Model – FIND SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.2.6. Dataset Specific Conformance for Study Root QR Information Model – FIND SOP Class C-FIND-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 20: Supported Query Keys for Study Root Information Model

Study Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	Single Value	
Q/R Study level				
Study Date	0008,0020	DA	Range, Single Value, Universal	
Study Time	00080030	TM	Universal matching	
Accession Number	0008,0050	SH	Single Value, Universal, Wild card	
Modalities in Study	0008,0061	CS	Single Value, Universal	
Referring Physician's Name	0008,0090	PN	Single Value, Universal, Wild card	
Patient's Name	0010,0010	PN	Single Value, Universal, Wild card	
Patient ID	0010,0020	LO	Single Value, Universal, Wild card	
Patient's Birth Date	0010,0030	DA	Single Value, Universal	
Patient's Sex	0010,0040	CS	Universal matching	
Study Instance UID	0020,000D	UI	Single Value	
Study ID	0020,0010	SH	Single Value, Universal, Wild card	
Q/R Series level				
Series Date	0008,0021	DA	Single Value	
Series Time	0008,0031	TM	Single Value	
Modality	0008,0060	CS	Single Value, Universal, Wild card	
Related Series Sequence	0008,1250	SQ		
Study Instance UID	0020,000D	UI	Single Value, Universal	
Series Instance UID	0020,000E	UI	Single Value, Universal	
Series Number	0020,0011	IS	Single Value, Universal	
Frame of Reference UID	0020,0052	UI	Single Value	
Philips private attribute	2001,0010	LO		Philips Imaging DD 001
Philips private attribute	2001,106E	SH		
Philips private attribute	2003,0020	LO		Philips X-ray Imaging DD 017
Philips private attribute	2003,2093	LO		
Philips private attribute	2003,2094	LO		
Philips private attribute	2003,2099	SH		

NOTE : A configuration template is available without the private attributes.

Table 21: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete – No final identifier is supplied	Successful completion of the query.

Service Status	Error Code	Further Meaning	Behavior
Failure	A700	Refused – Out of resources	Not enough resources; exception during evaluation of query.
	C000	Failed – Unable to process	Any other exception generated while evaluating the query.
Cancel	FE00	Matching terminated due to Cancel request	Query has been cancelled.
Pending	FF00	Matches are continuing – Current match is supplied and any optional keys were supported in the same manner as required keys	Optional keys supported.
	FF01	Matches are continuing – Warning that one or more optional keys were not supported for existence and/or matching for this identifier	Optional keys not supported.

4.2.1.3.3. (Real-World) Activity – MOVE as SCU

4.2.1.3.3.1. Description and Sequencing of Activities

The Interventional Workstation implements the Query/Retrieve service class to move selected images per Query/Retrieve SCP. After receiving a C-FIND responses one is able to copy all or selected images in a patient folder from a remote database to the local database. The Interventional Workstation initiates an association to the selected peer entity, sends a C-MOVE request and receives the related C-MOVE responses. The association is released after the final C-MOVE response (when all selected images have been transmitted).

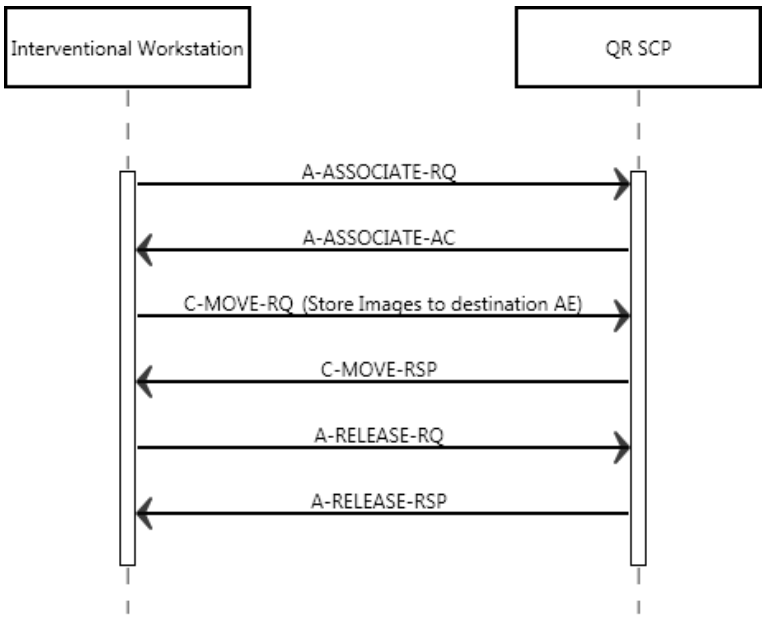

Figure 6: Data Flow Diagram – MOVE as SCU

4.2.1.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 22: Proposed Presentation Contexts for (Real-World) Activity – MOVE As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.3.3. SOP Specific Conformance for Patient Root QR Information Model – MOVE SOP Class

Once the queried image responses are received by the Interventional Workstation Network AE, the user may retrieve the images from the remote DICOM node. The system shall then initiate a C-MOVE-RQ to the remote DICOM node, with the destination AE. In response the remote node shall initiate a C-Store for the requested images to the destination AE.

4.2.1.3.3.3.1. Dataset Specific Conformance for Patient Root QR Information Model – MOVE SOP Class C-MOVE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 23: Identifiers for Patient Root Information Model MOVE as SCU

Patient Root Information Model			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008,0052	CS	
Q/R Patient level			
Patient ID	0010,0020	LO	
Specific Character Set	0008,0005	CS	
Q/R Study level			
Patient ID	0010,0020	LO	
Study Instance UID	0020,000D	UI	
Specific Character Set	0008,0005	CS	
Q/R Series level			
Patient ID	0010,0020	LO	
Study Instance UID	0020,000D	UI	
Series Instance UID	0020,000E	UI	
Specific Character Set	0008,0005	CS	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 24: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete – No failures	Successful completion of the retrieve; also storage warnings may have occurred.
Failure	A701	Refused – Out of resources – Unable to calculate number of matches	Storage status Refused: Out of resources.
	A801	Refused – Move destination unknown	Move destination is unknown.
	C000	Failed – Unable to process	Any other exception generated during the move.
Warning	B000	Sub-operations complete – One or more failures	Warning: One or more SOP instances have been successfully stored and the remaining has failed. Also in case of storage status Refused: SOP class not supported.
Cancel	FE00	Sub-operations terminated due to Cancel indication	Move request has been cancelled.
Pending	FF00	Sub-operations are continuing	Move pending.

4.2.1.3.3.4. SOP Specific Conformance for Study Root QR Information Model – MOVE SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.3.5. Dataset Specific Conformance for Study Root QR Information Model – MOVE SOP Class C-MOVE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 25: Identifiers for Study Root Information Model MOVE as SCU

Study Root Information Model			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008,0052	CS	
Q/R Study level			
Patient ID	0010,0020	LO	
Study Instance UID	0020,000D	UI	
Specific Character Set	0008,0005	CS	
Q/R Series level			
Patient ID	0010,0020	LO	
Study Instance UID	0020,000D	UI	
Series Instance UID	0020,000E	UI	
Specific Character Set	0008,0005	CS	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 26: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete – No failures	Successful completion of the retrieve; also storage warnings may have occurred.
Failure	A701	Refused – Out of resources – Unable to calculate number of matches	Storage status Refused: Out of resources.
	A801	Refused – Move destination unknown	Move destination is unknown.
	C000	Failed – Unable to process	Any other exception generated during the move.
Warning	B000	Sub-operations complete – One or more failures	Warning: One or more SOP instances have been successfully stored and the remaining has failed. Also in case of storage status Refused: SOP class not supported.
Cancel	FE00	Sub-operations terminated due to Cancel indication	Move request has been cancelled.
Pending	FF00	Sub-operations are continuing	Move pending.

4.2.1.3.4. (Real-World) Activity – Image Export

4.2.1.3.4.1. Description and Sequencing of Activities

The Interventional Workstation implements the Storage service class as part of the Interventional Workstation to store selected images at an archive or other storage SCP. All actual selected images are exported using one and the same association. The Interventional Workstation waits for synchronous report until, after a configurable time passed, it will release the association.

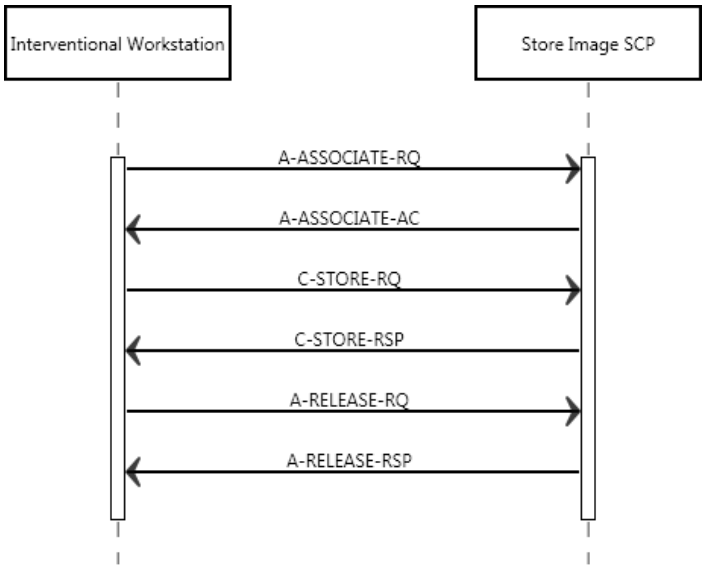

Figure 7: Data Flow Diagram – Store Image – Storage as SCU

4.2.1.3.4.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 27: Proposed Presentation Contexts for (Real-World) Activity – Image Export

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Ambulatory ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
CT Image Storage SOP	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Class		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital Mammography X-Ray Image Storage – Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital Mammography X-Ray Image Storage – Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital X-Ray Image Storage – For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital X-Ray Image Storage – For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced SR SOP Class	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Hemodynamic Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Multi-frame Grayscale Word	1.2.840.10008.5.1.4.1.1.7.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
SC Image Storage SOP Class		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Grayscale Softcopy Presentation State Storage	1.3.46.670589.2.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Xray MF Image	1.3.46.670589.7.8.1618510091	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Stent Boost WorkItem	1.3.46.670589.7.8.16185100912	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Live Run WorkItems	1.3.46.670589.7.8.1618510092	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Run WorkItems	1.3.46.670589.7.8.16185100129	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Reco WorkItems	1.3.46.670589.7.8.16185100130	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Three DCA WorkItem	1.3.46.670589.7.8.16185100913	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
SOP Class		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
			1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		RLE Lossless	1.2.840.10008.1.2.5		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		

Note: In the table above, only ILE is specified as transfer syntax. However, the supported transfer syntaxes can be configured to include additional syntaxes. See section 4.4.2, for details.
Fluoro overlay images cannot be exported and imported.

4.2.1.3.4.3. SOP Specific Conformance for Storage SOP Classes

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.
The Interventional Workstation will transmit all optional or private image attributes. Also the Interventional Workstation can create attributes that are not in the image: these new attributes are exported along with the image (e.g. when the SCP does not support presentation state objects).
Interventional Workstation adds private attributes with tags 2001, xxxx and 2003, xxxx to the following SOP classes:

Raw Data Storage SOP class	1.2.840.10008.5.1.4.1.1.66
Secondary Capture Image Storage SOP class	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1

These private attributes need to be preserved when the data is exported and imported back – failing which, the data can fail to import, or not open in the appropriate viewer. The exact attributes and their meanings are not elaborated in this document.

Choice of formats used for storing data
The following section describes the SOP classes used to store data which is created in each product. This information can be used to check support for the relevant SOP classes on the SCP-side, depending on the licenses installed on the Interventional Workstation. Details about the data-content of the formats chosen are given in subsequent sections.

Objects handled by the Products		Selectable in 'Patients' activity							Selectable in 'Export' activity			
		Allura 3D-RA, XperCT	3D Roadmap, MR-CT Roadmap, XperGuide, Embo Guide	Allura 3D-CA	Stent – boost	CT TrueView (incl. CTO Navigator)	Heart Navigator	2D Perfusion	Re constructions	Movies	Snap shots	VRMLs
Format chosen	X-Ray 3D Angiographic Image Storage (1.2.840.10008.5.1.4.1.1.13.1.1)	X							X			
	CT Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.2)	X							X			
	Raw Data Storage SOP Class (1.2.840.10008.5.1.4.1.1.66)	X	X	X	X	X						
	X-Ray Angiographic Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.12.1)	X	X	X	X	X	X	X				
	Multi-frame True Color Secondary Capture Image Storage (1.2.840.10008.5.1.4.1.1.7.4)									X		
	Secondary Capture Image Storage SOP Class (1.2.840.10008.5.1.4.1.1.7)					X	X	X		X	X	
	Embedded Document (1.3.46.670589.2.8.1.1)											X

Figure 8: Choice of formats used for storing data

Choice of format to store Volumes
3D-RA and XperCT volumes generated by the Interventional Workstation can be exported in one of two formats:
X-Ray 3D Angiographic Image Storage has preference. If the X-Ray 3D SOP class is not supported by the SCP, then the volume is sliced and exported as CT images. Once exported as CT images, the volume loses its link with the original data. Thereafter, the data can be brought back to XtraVision only for viewing. Operations like performing secondary reconstructions on that data are not possible.
Choice of format to store private data (Raw Data)
The Interventional Workstation exports private data in Raw Data Storage IODs without pixel data. Here we list out the attributes stored in the Raw Data Storage IOD per application. In case a PACS does not support Raw Data Storage, then these attributes will be lost in an archive–retrieve operation.
3D-RA and XperCT:
The above Meta data which is exported as Raw Data is useful only if the PACS supports X-Ray 3D Angiographic Image Storage also. For volumes sent out as CT Images this Meta Data is not relevant.
3D Roadmap, MultiModality Roadmap and XperGuide:
3D-CA:
1. 2D Image selection information
2. Delineation settings
3. Vessel names
4. Vessel/bifurcation selection information

CTTrueView:
1. Viewport arrangement
2. Visibility setting of curved reformat views
3. Visibility setting of the segmented heart
4. Visibility setting of obscured lines

Stentboost:
1. Calibration method
2. Region of Interest
3. Measurements
4. View settings: Zoom, Brightness and Contrast
5. Frame selection and marker settings Catheter lines and stent lines

Choice of format to store private data (Secondary Capture)
The Interventional Workstation also exports private data in Secondary Capture Storage IOD. These attributes are primarily the last seen settings of each application.

Choice of format to store images received from Modality
The 2D X-Ray Angiography frames received from the modality are exported using the X-Ray Angiographic Image Storage SOP class. The pixel content in the frames may be different from what was sent from the Modality. Hence a different instance UID is used while exporting them from the Interventional Workstation. In case the “X-Ray 3D Angiographic Image Storage” SOP class is included in the transfer (see 4.2.1.3.4.3.2), these frames are exported in the same series as the Volume.

Choice of format to store Movie
Interventional Workstation exports movies as Multi-Frame Secondary Capture Images, if that SOP class is supported. It exports movies as series of Single Frame Secondary capture Images (“Secondary Capture Image Storage” SOP class), if the Remote DICOM node doesn’t accept Multi-Frame Secondary Capture Images.

Choice of format to store Snapshots
Snapshots created in the Interventional Workstation are exported using the Secondary Capture Image Storage SOP class. Stereo Snapshots and Stack of Snapshots are exported as multiple Secondary Capture Images in a Series of their own.

4.2.1.3.4.3.1. Dataset Specific Conformance for C-STORE-RQ

Detail regarding the Dataset Specific response behavior will be reported in this section.

This includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 28: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful stored	Progress of the export job is updated and connection is retained for the next store. If the store of all the SOP instances is completed then the connection is released.
Failure	A7xx	Refused: Out of Resources	Error is logged and the export job fails. Connection is released.
	A9xx	Error: Data Set does not match SOP Class	Error is logged and the export job fails. Connection is released.
	Cxxx	Error: cannot understand	Error is logged and the export job fails. Connection is released.
Warning	B000	Coercion of Data Elements	Warning is logged and the export job continues. Connection is not released.
	B007	Data Set does not match SOP Class	Warning is logged and the export job continues. Connection is not released.
	B006	Elements Discarded	Warning is logged and the export job continues. Connection is not released.

4.2.1.3.5. (Real-World) Activity – Storage Commitment Push Model AS SCU

4.2.1.3.5.1. Description and Sequencing of Activities

Interventional Workstation Storage Commitment as a SCU service. It accepts a storage commitment notification (N-EVENT-REPORT) from systems that send them.

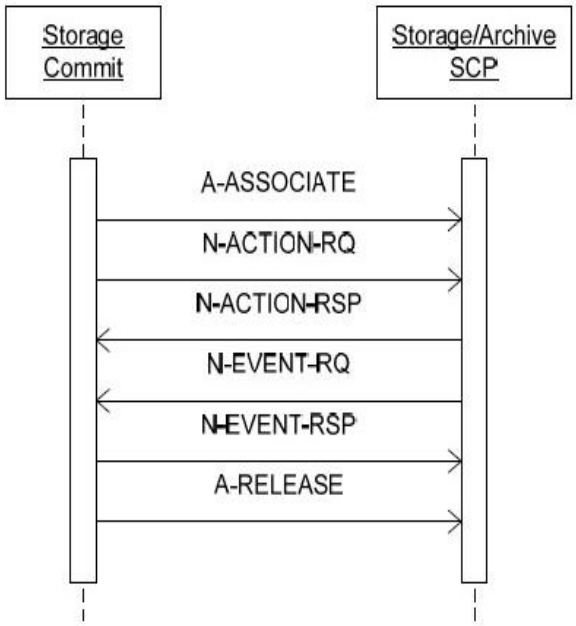

Figure 9: Data Flow Diagram – Commit Image (synchronous)

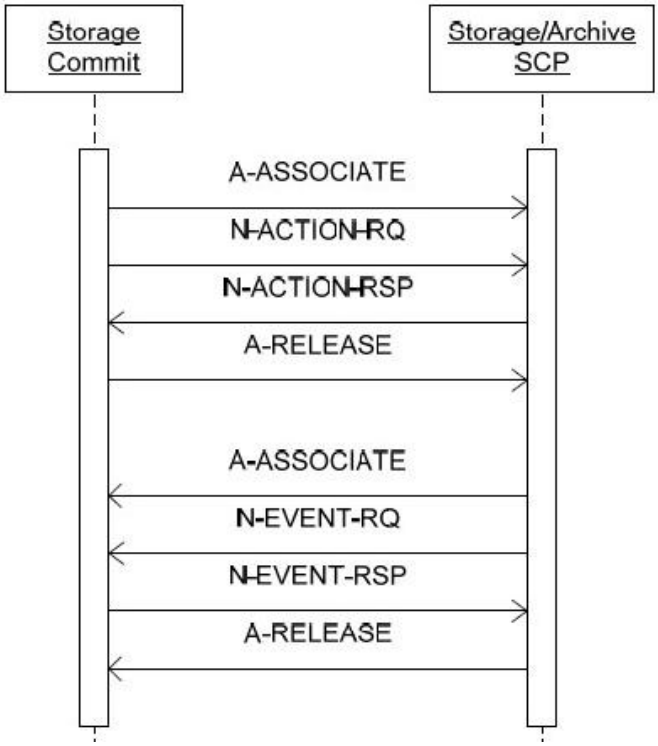

Figure 10: Data Flow Diagram – Commit Image (asynchronous)

4.2.1.3.5.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 29: Proposed Presentation Contexts for (Real-World) Activity – Storage Commitment Push Model AS SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.3.5.3. SOP Specific Conformance for Storage Commitment Push Model SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

Interventional Workstation provides standard conformance to the DICOM Storage Commitment service class.

4.2.1.3.5.3.1. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-EVENT-REPORT-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 30: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000		Successful completion of the request.

4.2.1.3.5.3.2. Dataset Specific Conformance for Storage Commitment Push Model SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 31: Storage Commitment Attribute for N-ACTION-RQ

Attribute Name	Tag	Comment
Storage Commitment Module		
Transaction UID	0008,1195	
Referenced SOP Sequence	0008,1199	
>Referenced SOP Class UID	0008,1150	
>Referenced SOP Instance UID	0008,1155	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 32: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000		Successful completion of the request.

4.2.1.3.6. (Real-World) Activity – Print Management as SCU

4.2.1.3.6.1. Description and Sequencing of Activities

The Interventional Workstation Network AE implements the Print Management service class as part of the Print component to send selected images to a printer (SCP).

As a result, the Interventional Workstation Network AE will initiate an association to the selected printer and use it to send the Print Service Elements of the Print SOP Classes. If the association could not be established, the Interventional Workstation Network AE will retry to establish an association every 20 seconds during the next hour.

Interventional Workstation allows having a print preview first.

In case of a print job association the printer status is requested in that association. The received printer status is displayed in the Printer Status Tool. On a failure printer status the Interventional Workstation Network AE will retry and request the printer status every 20 seconds during the next hour.

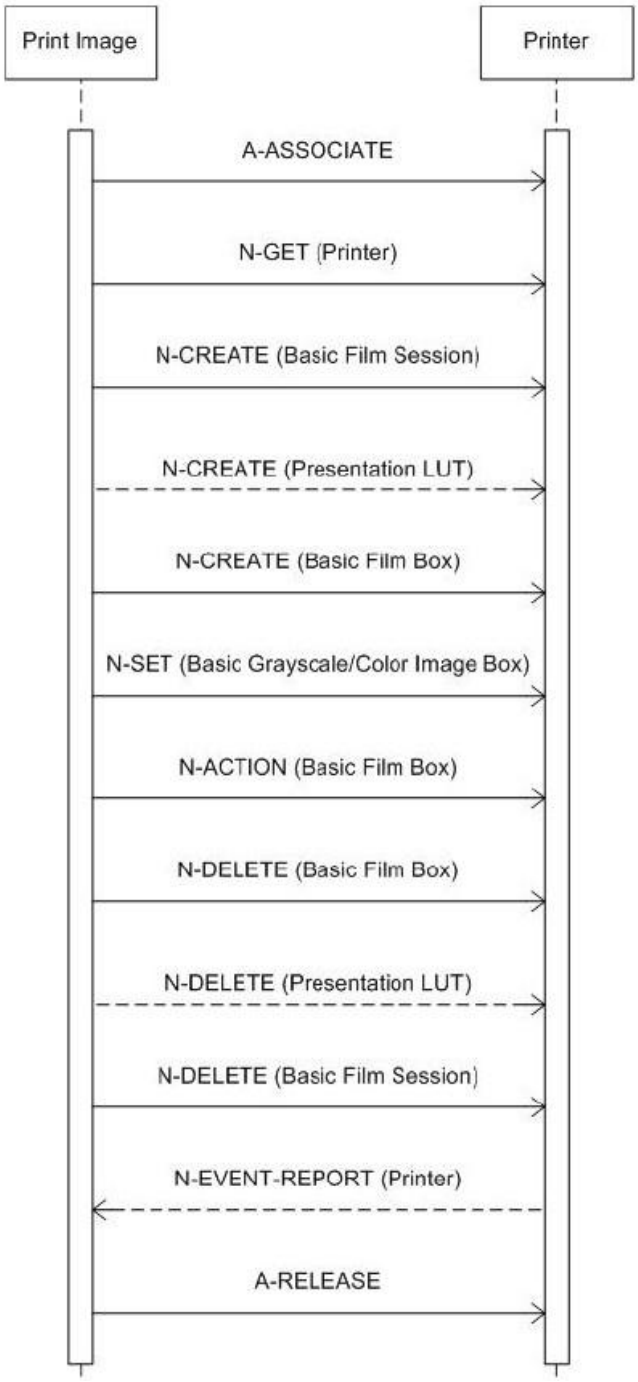

Figure 11: Data Flow Diagram – Print Management as SCU

Note that associations are proposed for either color or grayscale printing, not for both. The following optional SOP classes from these Meta SOP classes are not supported:

- Print Job SOP class (can be used to get a notification that a job is ready);
- Basic Annotations Box SOP class;
- Reference Image Box SOP class.

The grayscale standard display function adjusts the brightness such that equal changes in P-Values will result in the same level of perceptibility. DICOM color print is supported as Planar Interleaved method as well as Pixel Interleaved. The Planar Interleaved method is mandatory according to DICOM standard and means that each color plane (R, G, B) is rendered separately. So each image

must be rendered three times. This means that Planar Interleaved will be time consuming. For this reason the default method for DICOM color print will be set to Pixel Interleaved, where as the printer supports this.

The applied order of Print Service Elements (DIMSE's) is specified in Figure 5. Refer to the following sections for a description of the applied optional attributes in these Service Elements (i.e. non-mandatory attributes as Print SCU). Note that the Service Elements order is not specified by the DICOM standard. Overlay, Annotation (showing the values of some major identifying attributes) and Shutter information is processed in the images sent to the printer (i.e. burnt-in into the image).

The Status Codes of DIMSE Responses (Success, Warning, and Failure) as returned by the printer will also be logged (for service purposes) and are mapped onto general print job status messages towards the operator. These User Interface messages indicate:
- "Job Completed" and has the meaning that the print job is accepted by the printer; the actual printing will be done afterwards.
- "Print Error" indicating that a failure occurred during the DICOM Print. Also, most warning cases (like default printer values applied on optional print attributes) are interpreted as a print error because this will mostly result in a different print quality or print layout than expected.

The following implementation remarks are important to achieve successful printing:
- The number of Film Boxes per Film Session is one.
- The number of images per Film Box is one.
- The images to be printed on one film are rendered by Interventional Workstation Network AE into one logical image. This logical image is very large, depending on the pixel matrix size (pixels per line, lines per image), use of color or not. A rough indication is 20 Mbytes for grayscale and 80 Mbytes for color. One should take this into account when selecting the DICOM printer and the printer configuration (e.g. the amount of memory).

The Interventional Workstation Network AE does not send an attribute list to the printer. Therefore the mandatory attributes listed in the following sections are the only attributes that are required to be supported by the printer.

4.2.1.3.6.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 33: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18			SCU	None
>Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9			SCU	None
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

This section specifies each IOD created (including private IOD's).

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
VNAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

4.2.1.3.6.3. SOP Specific Conformance for Basic Color Image Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.3.1. Dataset Specific Conformance for Basic Color Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 34: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US		ALWAYS	AUTO	
Polarity	2020,0020	CS		ALWAYS	AUTO	
Basic Color Image Sequence	2020,0111	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS		ALWAYS	IMPLICIT	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>Bits Allocated	0028,0100	US		ALWAYS	AUTO	
>Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
>High Bit	0028,0102	US		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 35: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Image successfully stored in image box.	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues and the warning is logged.
	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	The print job continues and the warning is logged.
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job continues and the warning is logged.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B600	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B603	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.4. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.4.1. Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 36: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST		ALWAYS	AUTO	
Film Orientation	2010,0040	CS		ALWAYS	CONFIG, IMPLICIT	
Film Size ID	2010,0050	CS		ALWAYS	CONFIG, IMPLICIT	
Magnification Type	2010,0060	CS		ALWAYS	AUTO	
Max Density	2010,0130	US		ALWAYS	AUTO	
Trim	2010,0140	CS		ALWAYS	AUTO	
Configuration Information	2010,0150	ST		ALWAYS	AUTO	

Table 37: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 38: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film accepted for printing.	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page).	The print job continues and the warning is logged.
	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues and the warning is logged.
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job continues and the warning is logged.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B600	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B605	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.4.2. Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 39: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B600	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B603	(not defined)	The print job continues and the warning is logged.
	B604	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	B609	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.4.3. Dataset Specific Conformance for Basic Film Box SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 40: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	Print job continues.
Failure	xxxx	(any failure)	Print job fails, the error is logged and the association is released.
Warning	xxxx	(any warning)	Print job fails, the warning is logged and the association is released.

4.2.1.3.6.5. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.5.1. Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 41: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS		ALWAYS	IMPLICIT	
Print Priority	2000,0020	CS		ALWAYS	AUTO	
Medium Type	2000,0030	CS		ALWAYS	IMPLICIT	
Film Destination	2000,0040	CS		ALWAYS	AUTO	
Film Session Label	2000,0050	LO		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 42: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B600	Memory allocation not supported.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B603	(not defined)	The print job continues and the warning is logged.
	B604	(not defined)	The print job continues and the warning is logged.
	B605	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	B609	(not defined)	The print job continues and the warning is logged.
	B60A	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.5.2. Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 43: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues.
Failure	xxxx	(any failure)	The print job fails, the error is logged and the association is released.
Warning	xxxx	(any warning)	The print job fails, the warning is logged and the association is released.

4.2.1.3.6.6. SOP Specific Conformance for Printer SOP Class of the Basic Color Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.6.1. Dataset Specific Conformance for Printer SOP Class N-EVENT-REPORT-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 44: N-EVENT-REPORT Status Handling Behavior

Event Type Name	Event Type ID	Behavior
Normal	1	The N-EVENT-REPORT-RSP is sent with: Status = 0, Event Type ID = 1
		Information is logged: N-EVENT-REPORT received, type: NORMAL
Warning	2	The N-EVENT-REPORT-RSP is sent to the SCP with: Status = 0, Event Type ID = 2
		Warning is logged: N-EVENT-REPORT received, type: WARNING Status info: <Status info>
Failure	3	The N-EVENT-REPORT-RSP is sent to the SCP with: Status = 0, Event Type ID = 3
		Error is Logged: N-EVENT-REPORT received, type: FAILURE Status info: <Status info>
		Printer status is set to DICOM_PRINTER_STATUS_FAILURE. The print job retries the print operation.

All possible status responses are provided in the following table.

Table 45: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The result is logged.

4.2.1.3.6.6.2. Dataset Specific Conformance for Printer SOP Class N-GET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 46: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	0001	Requested optional attributes are not supported	The print job continues and the warning is logged.
	Xxxx	(any warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.7. SOP Specific Conformance for Basic Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.7.1. Dataset Specific Conformance for Basic Film Box SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 47: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST		ALWAYS	AUTO	
Film Orientation	2010,0040	CS		ALWAYS	CONFIG, IMPLICIT	
Film Size ID	2010,0050	CS		ALWAYS	CONFIG, IMPLICIT	
Magnification Type	2010,0060	CS		ALWAYS	AUTO	
Max Density	2010,0130	US		ALWAYS	AUTO	
Trim	2010,0140	CS		ALWAYS	AUTO	
Configuration Information	2010,0150	ST		ALWAYS	AUTO	

Table 48: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 49: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	The print job continues and completes.

Service Status	Error Code	Further Meaning	Behavior
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B600	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B603	(not defined)	The print job continues and the warning is logged.
	B604	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	B609	(not defined)	The print job continues and the warning is logged.
	B60A	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.7.2. Dataset Specific Conformance for Basic Film Box SOP Class N-ACTION-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 50: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film accepted for printing.	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B603	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page).	The print job continues and the warning is logged.
	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues and the warning is logged.
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job continues and the warning is logged.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B600	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B605	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.7.3. Dataset Specific Conformance for Basic Film Box SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 51: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged and the association is released.
Warning	xxxx	(any warning)	Print job fails, the warning is logged and the association is released.

4.2.1.3.6.8. SOP Specific Conformance for Basic Film Session SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.8.1. Dataset Specific Conformance for Basic Film Session SOP Class N-CREATE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 52: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS		ALWAYS	IMPLICIT	
Print Priority	2000,0020	CS		ALWAYS	AUTO	
Medium Type	2000,0030	CS		ALWAYS	IMPLICIT	
Film Destination	2000,0040	CS		ALWAYS	AUTO	
Film Session Label	2000,0050	LO		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 53: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film session successfully created.	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B600	Memory allocation not supported.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.
	B603	(not defined)	The print job continues and the warning is logged.
	B604	(not defined)	The print job continues and the warning is logged.
	B605	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	B609	(not defined)	The print job continues and the warning is logged.
	B60A	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.8.2. Dataset Specific Conformance for Basic Film Session SOP Class N-DELETE-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 54: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Command successful	Print job continues.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	xxxx	(any warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.9. SOP Specific Conformance for Basic Grayscale Image Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.9.1. Dataset Specific Conformance for Basic Grayscale Image Box SOP Class N-SET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 55: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US		ALWAYS	AUTO	
Polarity	2020,0020	CS		ALWAYS	AUTO	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS		ALWAYS	IMPLICIT	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>Bits Allocated	0028,0100	US		ALWAYS	AUTO	
>Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
>High Bit	0028,0102	US		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 56: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	B604	Image size is larger than image box size, the image has been demagnified.	The print job continues and the warning is logged.
	B609	Image size is larger than the image box size. The image has been cropped to fit.	The print job continues and the warning is logged.
	B60A	Image size or combined print image size is larger than the image box size. Image or combined print image has been decimated to fit.	The print job continues and the warning is logged.
	0107	(not defined)	The print job continues and the warning is logged.
	0116	(not defined)	The print job continues and the warning is logged.
	B600	(not defined)	The print job continues and the warning is logged.
	B601	(not defined)	The print job continues and the warning is logged.
	B602	(not defined)	The print job continues and the warning is logged.

Service Status	Error Code	Further Meaning	Behavior
	B603	(not defined)	The print job continues and the warning is logged.
	B605	(not defined)	The print job continues and the warning is logged.
	B606	(not defined)	The print job continues and the warning is logged.
	B608	(not defined)	The print job continues and the warning is logged.
	Xxxx	(any other warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.3.6.10. SOP Specific Conformance for Printer SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.3.6.10.1. Dataset Specific Conformance for Printer SOP Class N-EVENT-REPORT-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 57: N-EVENT-REPORT Status Handling Behavior

Event Type Name	Event Type ID	Behavior
Normal	1	The N-EVENT-REPORT-RSP is sent to the SCP with: Status = 0, Event Type ID = 1
		Information is logged: N-EVENT-REPORT received, type: NORMAL
Warning	2	The N-EVENT-REPORT-RSP is sent to the SCP with: Status = 0, Event Type ID = 2
		Warning is logged: N-EVENT-REPORT received, type: WARNING Status info: <Status info>
Failure	3	The N-EVENT-REPORT-RSP is sent to the SCP with: Status = 0, Event Type ID = 3
		Error is Logged: N-EVENT-REPORT received, type: FAILURE Status info: <Status info>
		Printer status is set to DICOM_PRINTER_STATUS_FAILURE. The print job retries the print operation.

All possible status responses are provided in the following table.

Table 58: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The result is logged.

4.2.1.3.6.10.2. Dataset Specific Conformance for Printer SOP Class N-GET-SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 59: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	The print job continues and completes.
Failure	xxxx	(any failure)	Print job fails, the error is logged, and the association is released.
Warning	xxxx	(any warning)	Print job fails, the warning is logged, and the association is released.

4.2.1.4. Association Acceptance Policy

The Interventional Workstation Network AE accepts associations for the following purposes:
- To allow remote applications to verify application level communication.
- To allow remote applications to store images in the Interventional Workstation database.
- To allow remote applications to commit images in the Interventional Workstation database.
- To allow remote applications to query the Interventional Workstation database.

- To allow remote applications to retrieve images from the Interventional Workstation database.
- To allow remote applications to send storage commit reports to Interventional Workstation as SCU.

The Interventional Workstation Network AE rejects association requests from unknown applications, i.e. applications that offer an unknown “calling AE title”. An application is known if and only if it is defined per configuration of the Interventional Workstation system. The Interventional Workstation Network AE also rejects association requests from applications that do not address the Interventional Workstation Network AE, i.e. that offer a wrong “called AE title”. The Interventional Workstation AE title is defined during configuration of Interventional Workstation.

The Application Entity may reject Association attempts as shown in the table below.

Table 60: Association Reject Reasons

Result	Source	Reason/Diagnosis	Behavior
1 – rejected permanent	1 – DICOM UL service-user	1 – no-reason-given	Association is not established due to any problem other than that specified for Interventional Workstation SCP in the rows below. (Example: Problem while decoding the DICOM stream).
		2 – application-context-name-not-supported	An application context name other than 1.2.840.10008.3.1.1.1 is requested by the SCU during association.
		3 – calling-AE-title-not-recognized	The configuration does not contain a repository having the Calling AE Title as per the association request; There is a problem in configuration (related to composing the configuration from the SCU and the SCP configuration).
		7 – called-AE-title-not-recognized	The called AE Title in the association request does not match the AE Title as per the configuration.
	2 – DICOM UL service provider (ACSE related function)	1 – no-reason-given	Not used.
		2 – protocol-version-not-supported	Not used.
	3 – DICOM UL service provideR(Presentation related function)	1 – temporary-congestion	Not used.
		2 – local-limit-exceeded	Not used.
2 – rejected-transient	1 – DICOM UL service-user	1 – no-reason-given	Not used.
		2 – application-context-name-not-supported	Not used.
		3 – calling-AE-title-not-recognized	Not used.
		7 – called-AE-title-not-recognized	Not used.
	2 – DICOM UL service provider (ACSE related function)	1 – no-reason-given	Maximum number of associations is exceeded and an association request is received.
		2 – protocol-version-not-supported	Not used.
	3 – DICOM UL service provider (Presentation related function)	1 – temporary-congestion	Not used.
		2 – local-limit-exceeded	Not used.

The behavior of the AE for sending an Association abort is summarized in next table.

Table 61: Association Abort Policies

Source	Reason/Diagnosis	Behavior when received	Sent when
0 – DICOM UL service-user (initiated abort)	0 – reason-not-specified	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (0: ABORT_SOURCE_dul_user, 0: ABORT_REASON_not_specified).	Association times out due to inactivity; Any other problem than ones specified for Interventional Workstation SCP in the rows below. (Examples: Problem while decoding the DICOM stream, Invalid request, Echo/Find/Move/N-Action SCP was unable to send the Response to SCU, Error writing to SCU stream).

Source	Reason/Diagnosis	Behavior when received	Sent when
2 – DICOM UL service-provider (initiated abort)	0 – reason-not-specified	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 0: ABORT_REASON_not_specified)	Import fails (Import SCP Performer returns fail status)
	1 – unrecognized-PDU	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 1: ABORT_REASON_unrecognized_pdu).	An unrecognized PDU type is received[4].
	2 – unexpected-PDU	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 2: ABORT_REASON_unexpected_pdu).	The received PDU type is not expected in the current state of connection[5].
	4 – unrecognized-PDU parameter	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 4: ABORT_REASON _unrecognized_pdu_parameter).	An unrecognized Associate PDU item is received[1].
	5 – unexpected-PDU parameter	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 5: ABORT_REASON _unexpected_pdu_parameter).	One of the Associate PDU items is received more than once[2]; One of the Associate PDU items is received unexpectedly[2].
	6 – invalid-PDU-parameter value	When received, the Interventional Workstation Network AE terminates the connection with the following log: Association ABORTED by peer (2: ABORT_SOURCE_dul_provider, 6: ABORT_REASON _invalid_pdu_parameter).	One of the Associate PDU items is received more than once[3]; One of the Associate PDU items is not received[3]; Empty Called AE Title String (space-only) is received; Empty Calling AE Title String (space-only) is received; Unknown abstract syntax is received; The length or the format of the received PDU item is invalid.

Notes:

1. Associate PDU items that are recognized:
- 0x10 APPLICATION CONTEXT
- 0x20 PRESENTATION CONTEXT (RQ)
- 0x21 PRESENTATION CONTEXT (AC)
- 0x30 ABSTRACT SYNTAX
- 0x40 TRANSFER SYNTAX
- 0x50 USER INFO
- 0x51 MAXIMUM LENGTH
- 0x52 IMPLEMENTATION CLASS UID
- 0x53 ASYNCHRONOUS OPERATIONS WINDOW
- 0x54 SCP/SCU ROLE SELECTION
- 0x55 IMPLEMENTATION VERSION NAME
- 0x56 SOP CLASS EXTENDED NEGOTIATION

2. Associate PDU items for Unexpected-PDU parameter Received more than once:
- 0x10 APPLICATION CONTEXT (SCU, SCP)
- 0x30 ABSTRACT SYNTAX (SCU, SCP)
- 0x40 TRANSFER SYNTAX (SCU)

Received unexpectedly:
- 0x20 PRESENTATION CONTEXT (RQ) (SCU)

3. Associate PDU items for Invalid-PDU parameter value:
Received more than once (SCU, SCP):
- 0x50 USER INFO
- 0x51 MAXIMUM LENGTH
- 0x52 IMPLEMENTATION CLASS UID
- 0x53 ASYNCHRONOUS OPERATIONS WINDOW
- 0x55 IMPLEMENTATION VERSION NAME

Received illegally:
- 0x21 PRESENTATION CONTEXT (AC) (SCP)

PDU items not received:
- 0x10 APPLICATION CONTEXT (SCU, SCP)
- 0x20 PRESENTATION CONTEXT (RQ) (SCP)
- 0x21 PRESENTATION CONTEXT (AC) (SCU)
- 0x50 USER INFO (SCU, SCP)
- 0x30 ABSTRACT SYNTAX (SCU)
- 0x40 TRANSFER SYNTAX (SCU)
- 0x51 MAXIMUM LENGTH (SCU, SCP)
- 0x52 IMPLEMENTATION CLASS UID (SCU)

4. PDU types that are recognized:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
- 0x07 A-ABORT

5. Expected PDU’s for following states:
STATE_IDLE:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP

STATE_ASSOCIATED:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x06 A-RELEASE-RP

STATE_ASSOCIATING (SCU):
- 0x01 A-ASSOCIATE-RQ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP

STATE_RELEASING:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ

STATE_WAIT_FOR_ASSOCIATE (SCP):
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ

- 0x06 A-RELEASE-RP
- 0x07 A-ABORT

STATE_WAIT_FOR_FINISH:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP

STATE_WAIT_FOR_DISCONNECT:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ

STATE_TIMED_OUT:
- 0x01 A-ASSOCIATE-RQ
- 0x02 A-ASSOCIATE-AC
- 0x03 A-ASSOCIATE-RJ
- 0x04 P-DATA-TF
- 0x05 A-RELEASE-RQ
- 0x06 A-RELEASE-RP
- 0x07 A-ABORT

4.2.1.4.1. (Real-World) Activity – Verification as SCP

4.2.1.4.1.1. Description and Sequencing of Activities

The Interventional Workstation accepts Associations from configured systems that wish to verify application level communication using the C-ECHO command.

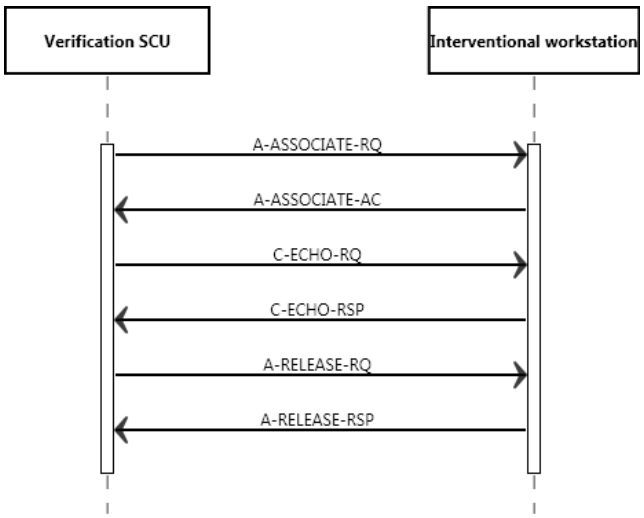

Figure 12: Data Flow Diagram – Verify

4.2.1.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 62: Acceptable Presentation Contexts for (Real-World) Activity – Verification as SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

The Interventional Workstation accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed presentation contexts with the same SOP class but different transfer syntaxes are accepted by the Interventional Workstation as far as those transfer syntaxes are part of the acceptable transfer syntaxes. There is no check for duplicate contexts and these are therefore accepted.

4.2.1.4.1.3. SOP Specific Conformance for Verification SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.4.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This part of the section includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 63: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	Confirm the verification request.

4.2.1.4.2. (Real-World) Activity – FIND as SCP

4.2.1.4.2.1. Description and Sequencing of Activities

The Interventional Workstation Network AE provides standard conformance to the DICOM Query/Retrieve service class. Optional keys are supported, depending on the data repository table that the remote system respectively the system integrator proposes. Relational queries are not supported. The Interventional Workstation Network AE generates a C-FIND response for each match with an identifier containing the values of all known attributes identified by the requested key fields. All such responses will have a status of Pending, indicating that the process of matching is not complete. When the process of matching is complete a C-FIND response is sent with a status of success and no identifier. A Refused or Failed response to a C-FIND request indicates that the Interventional Workstation is unable to process the request.

The SCU may cancel the C-FIND service by issuing a C-FIND-CANCEL request at any time during the processing of the C-FIND service. The Interventional Workstation will interrupt all matching and return a status of Cancelled.

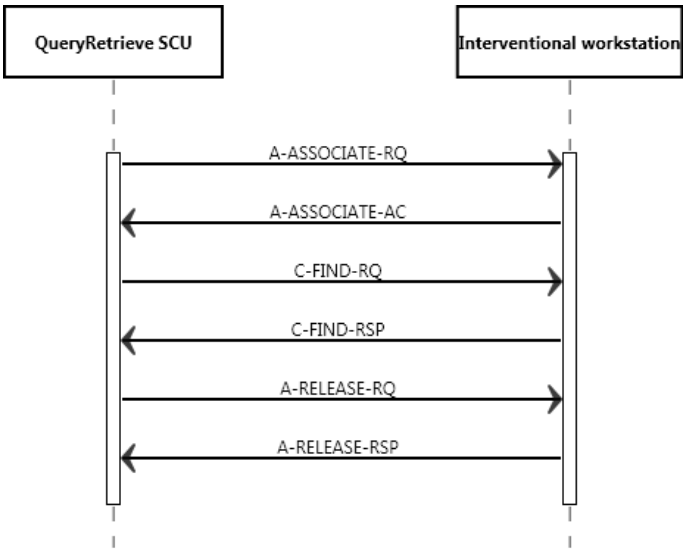

Figure 13: Data Flow Diagram – FIND as SCP

4.2.1.4.2.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 64: Acceptable Presentation Contexts for (Real-World) Activity – FIND As SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Patient Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Study Root QR Information Model – FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.4.2.3. SOP Specific Conformance for Patient Root QR Information Model – FIND SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.4.2.3.1. Dataset Specific Conformance for Patient Root QR Information Model – FIND SOP Class C-FIND-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 65: Requested Query Keys for Patient Root Information Model

Patient Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	Single Value	
Q/R Patient level				
Patient ID	0010,0020	LO	Single Value, Universal, Wild card	
Patient's Name	0010,0010	PN	Single Value, Universal, Wild card	
Issuer of Patient ID	0010,0021	LO		
Patient Birth date	0010,0030	DT		

Patient Sex	0010,0040	CS		
Q/R Study level				
Specific Character Set	0008,0005	CS		
Study Date	0008,0020	DA	Range, Single Value	
Study Time	0008,0030	TM	Range, Single Value	
Accession Number	0008,0050	SH	Single Value, Universal, Wild card	
Modalities in Study	0008,0061	CS		
Referring Physician's Name	0008,0090	PN		
Study Description	0008,1030	LO		
Patient's Name	0010,0010	PN		
Patient ID	0010,0020	LO	Single Value	
Patient's Birth Date	0010,0030	DA		
Patient's Sex	0010,0040	CS		
Study Instance UID	0020,000D	UI	Single Value, Universal	
Study ID	0020,0010	SH	Single Value, Universal, Wild card	
Number of Study Related Series	0020,1206	IS		
Number of Study Related Instances	0020,1208	IS		
Q/R Series level				
Specific Character Set	0008,0005	CS		
Modality	0008,0060	CS	Single Value, Universal	
Series Description	0008,103E	LO		
Patient ID	0010,0020	LO	Single Value	
Study Instance UID	0020,000D	UI	Single Value, Universal	
Series Instance UID	0020,000E	UI	Single Value, Universal	
Series Number	0020,0011	IS	Single Value, Universal, Wild card	
Number of Series Related Instance	0020,1209	IS		
Scheduled Procedure Step ID	0040,0009	SH		
Performed Procedure Step Start Date	0040,0244	DA		
Performed Procedure Step Start Time	0040,0245	TM		
Request Attributes Sequence	0040,0275	SQ		
Requested Procedure ID	0040,1001	SH		
Q/R Image level				
Specific Character Set	0008,0005	CS		
SOP Class UID	0008,0016	UI		
SOP Instance UID	0008,0018	UI		
Patient ID	0010,0020	LO		
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Instance Number	0020,0013	IS		

4.2.1.4.2.4. SOP Specific Conformance for Study Root QR Information Model – FIND SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.4.2.4.1. Dataset Specific Conformance for Study Root QR Information Model – FIND SOP Class C-FIND-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 66: Requested Query Keys for Study Root Information Model

Study Root Information Model				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
Query/Retrieve Level	0008,0052	CS	Single Value	
Q/R Study level				
Study Date	0008,0020	DA	Range, Single Value	
Study Time	0008,0030	TM	Universal	
Study ID	0020,0010	SH	Single Value, Universal, Wild card	
Accession Number	0008,0050	SH	Single Value, Universal, Wild card	
Modalities in Study	0008,0061	CS		
Referring Physician's Name	0008,0090	PN	Single Value, Universal	
Study Description	0008,1030	LO		
Patient's Name	0010,0010	PN		
Patient ID	0010,0020	LO		
Issuer of Patient ID	0010,0021	LO		
Patient's Birth Date	0010,0030	DA		
Patient's Sex	0010,0040	CS		
Study Instance UID	0020,000D	UI	Single Value, Universal	
Study ID	0020,0010	SH		
Number of Study Related Series	0020,1206	IS		
Number of Study Related Instances	0020,1208	IS		
Q/R Series level				
Modality	0008,0060	CS	Single Value, Universal	
Series Description	0008,103E	LO		
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Series Number	0020,0011	IS		
Number of Series Related Instance	0020,1209	IS		
Scheduled Procedure Step ID	0040,0009	SH		
Performed Procedure Step Start Date	0040,0244	DA		
Performed Procedure Step Start Time	0040,0245	TM		
Request Attributes Sequence	0040,0275	SQ		
Requested Procedure ID	0040,1001	SH		
Q/R Image level				
Modality	0008,0060	CS	Single Value, Universal	
SOP Class UID	0008,0016	UI		
SOP Instance UID	0008,0018	UI		
Study Instance UID	0020,000D	UI		
Series Instance UID	0020,000E	UI		
Instance Number	0020,0013	IS		

4.2.1.4.3. (Real-World) Activity – MOVE as SCP

Interventional Workstation accepts associations from systems that wish to retrieve images from the Interventional Workstation database using the C-MOVE command

4.2.1.4.3.1. Description and Sequencing of Activities

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.
During the processing of the C-STORE sub-operations Interventional Workstation optionally generates responses to the C-MOVE with status equal to pending. These C-MOVE responses indicate a number of remaining C-STORE sub-operations and the number of

CSTORE sub-operations returning the status of Success, Warning, and Failed. When the number of remaining C-STORE sub-operations reaches zero, the Interventional Workstation generates a final response with the status of equal to Success, Warning, Failed, or Refused. This response may indicate the number of C-STORE sub-operations returning the status of Success, Warning, and Failed.
The SCU may cancel the C-MOVE service by issuing a C-MOVE-CANCEL request at any time during the processing of the C-MOVE. The XtraVision terminates all incomplete CSTORE sub-operations and returns a status of Cancelled.

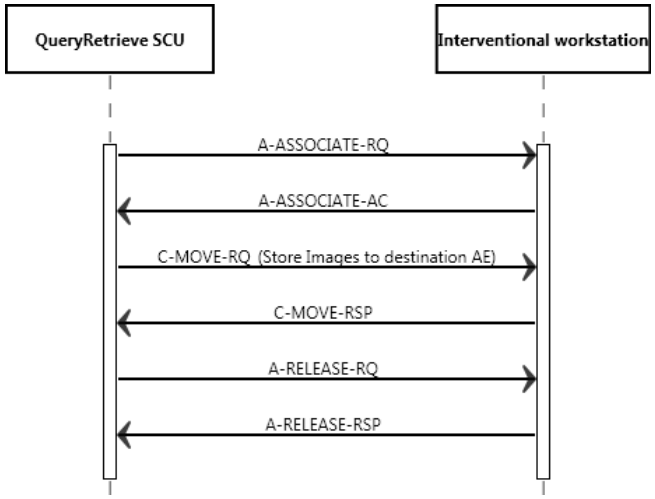

Figure 14: Data Flow Diagram – MOVE as SCP

4.2.1.4.3.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 67: Acceptable Presentation Contexts for (Real-World) Activity – MOVE As SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Patient Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Study Root QR Information Model – MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.1.4.3.3. SOP Specific Conformance for Patient Root QR Information Model – MOVE SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.4.3.3.1. Dataset Specific Conformance for Patient Root QR Information Model – MOVE SOP Class C-MOVE-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 68: Identifiers for MOVE Patient Root Information Model as SCP

Patient Root Information Model			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008,0052	CS	

4.2.1.4.3.4. SOP Specific Conformance for Study Root QR Information Model – MOVE SOP Class

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.

4.2.1.4.3.4.1. Dataset Specific Conformance for Study Root QR Information Model – MOVE SOP Class C-MOVE-SCP

Detail regarding the Dataset Specific response behavior will be reported in this section.

Table 69: Identifiers for MOVE Study Root Information Model as SCP

Study Root Information Model			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008,0052	CS	

4.2.1.4.4. (Real-World) Activity – Image Import

4.2.1.4.4.1. Description and Sequencing of Activities

The Interventional Workstation accepts associations from configured systems that wish to store images in the Interventional Workstation database using the C-STORE command.

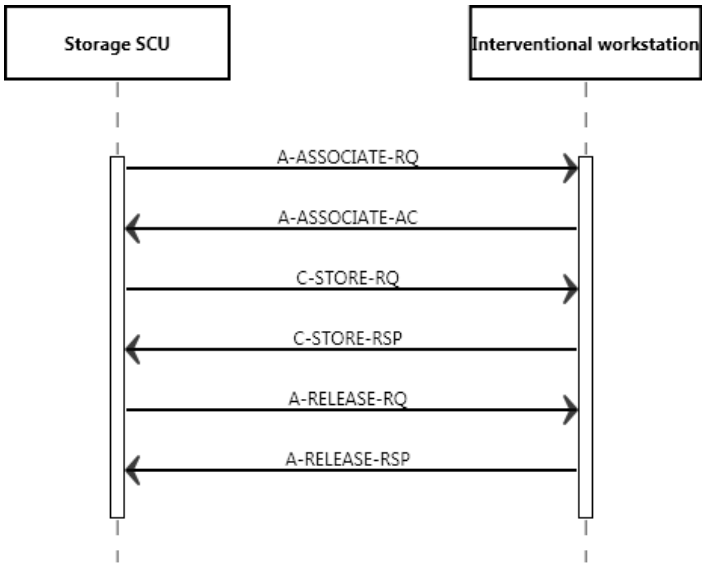

Figure 15: Data Flow Diagram – Store Image – Storage as SCP

4.2.1.4.4.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 70: Acceptable Presentation Contexts for (Real-World) Activity – Image Import

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Ambulatory ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital Mammography X-Ray Image Storage – Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital Mammography X-Ray Image Storage – Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital X-Ray Image Storage – For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Digital X-Ray Image Storage – For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced SR SOP Class	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
General ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Hemodynamic Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private Grayscale Softcopy Presentation State Storage	1.3.46.670589.2.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		RLE Lossless	1.2.840.10008.1.2.5		
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91		
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51		
		JPEG Lossless, Non-Hierarchical, FOP (Process 14)	1.2.840.10008.1.2.4.70		
		RLE Lossless	1.2.840.10008.1.2.5		

Note: In the table above, only ILE is specified as transfer syntax. However, the supported transfer syntaxes can be configured to include additional syntaxes. See section 4.4.2. for details.
Fluoro overlay images cannot be exported and imported.

4.2.1.4.4.3. SOP Specific Conformance for Storage SOP Classes

This section and sub-section include the manufacturer SOP and Dataset specific information as well the status codes and their corresponding behavior.
The Interventional Workstation will only accept associations from configured systems. The Interventional Workstation may provide level 2 (full) conformances, depending on the implemented database.

Remarks:
- Pixel data will be stored in configurable transfer syntax. This implies that transfer syntax conversions might take place during import. Compressed pixel data is always decompressed and afterwards converted to the “configurable transfer syntax”.
- A non-empty BOT may be present in imported JPEG encoded pixel data.
- When importing an image a default Presentation State object may be created as specified in Table 58. In case a default Presentation State object is created (also for duplicate images), the following rules apply:

- If a private Presentation State is present in the image the default Presentation State is always created based upon the private Presentation State.
- For multi-frame images with one frame it is configurable if a Presentation State should be created for every image in the series or only one Presentation State for the whole series.

Table 71: Conditions for creating Default Presentation State Object

Accepted association contains PR SOP class	Private PR is present in imported image	Default PR object created
Yes	Yes / No	No
No	Yes	Yes
No	No	No

- Value Representation 'UN' (Unknown) is supported, and shall be used for any attributes not known to Interventional Workstation and received per implicit transfer (ILE).
- Attribute values from images may be copied into related Presentation States and vice versa.
- Images must contain the minimum set of attributes prescribed by DICOM. Otherwise the default behavior is that the image is rejected and the association aborted.

4.2.1.4.4.3.1. Dataset Specific Conformance for C-STORE-RSP

Detail regarding the Dataset Specific response behavior will be reported in this section.
This includes the dataset specific behavior, i.e. error codes, error and exception handling, time-outs, etc.

Table 72: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful command	Successful completion of the store request.
Failure	A700	Refused: out of resources	Not enough resources available to do a store.
	C000	Error: cannot understand	Any other exception generated during the store.

4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The System provides only DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.
TCP/IP is the only protocol stack supported.
Supported physical medium include:
IEEE 802.3-1995, 10BASE-T
IEEE 802.3-1995, 100BASE-TX (Fast Ethernet)
IEEE 802.3, 1000BASE-X (Fiber Optic Gigabit Ethernet).

The TCP/IP Stack as supported by the underlying Operating System.
The API is the WinSock 2 interface as supported by the underlying Operating System.

4.3.2. Additional Protocols

No additional protocols are used.

4.4. Configuration

Any implementation's DICOM conformance may be dependent upon configuration, which takes place at the time of installation. Issues concerning configuration are addressed in this section.

4.4.1. AE Title/Presentation Address Mapping

An important installation issue is the translation from AE title to presentation address. How this is to be performed is described here.

4.4.1.1. Local AE Titles

The Field Service User Interface only allows one AE to be configured.

The following AE specific information must be available to configure a local AE:
- AE title.
- Port number (note that normally all local Interventional Workstation AE's will have a different port number).

4.4.1.2. Remote AE Title/Presentation Address Mapping

One or more remote AE's may be configured.

The following AE specific information must be available to configure a remote AE:
- AE title.
- Hostname or IP address (or both).
- Port number.

4.4.2. Parameters

The specification of important operational parameters, their default value and range (if configurable) are specified here.

Table 73: Configuration Parameters Table

Parameter	Configurable	Default Value
General Parameter		
Time-out waiting for acceptance or rejection Response to an Association Open Request (Application Level timeout)	Yes	60 [s] (set 0 for no time-out)
General Dimse level time-out values (Verification, Storage, Storage Commitment)	No	-

Parameter	Configurable	Default Value
Time-out for response to TCP/IP connect request. (Low-level timeout)	OS	-
Time-out waiting for acceptance of a TCP/IP message over the network (Low-level timeout)	OS	-
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	OS	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	OS	-
AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can send and receive	Yes	0
Association time-out SCP	Yes	0 (no time-out)
Association time-out SCU	Yes	0 (no time-out; set –1 for immediate time-out, or else value in [s])
AE specific DIMSE level time-out values	Yes	300 [s] (set 0 for no time-out)
Storage Commit Max Reply Waiting Time (after time-out the reply will be handled asynchronously)	Yes	60 [s] (set 0 for no time-out, –1 for immediate time-out)
Number of simultaneous associations by service and/or SOP class	No	1 per service/SOP class
SOP Class support	Yes	All supported SOP classes
Transfer Syntax support*	Yes	ELE – 1.2.840.10008.1.2.1
		EBE – 1.2.840.10008.1.2.2
		ILE – 1.2.840.10008.1.2
		JPEG Lossless (NH-FOP) – 1.2.840.10008.1.2.4.70
		JPEG Baseline – 1.2.840.10008.1.2.4.50
		JPEG Extended – 1.2.840.10008.1.2.4.51
		JPEG 2000 (Lossless Only) – 1.2.840.10008.1.2.4.90
		JPEG 2000 – 1.2.840.10008.1.2.4.91
		RLE – 1.2.840.10008.1.2.5
IsArchive	Yes	False

***Note:**

Although it is possible to configure encapsulation transfer syntax for every SOP class, encapsulation transfer syntax is practically not applicable for SOP classes that contain no data to be encoded and such transfer syntax should therefore be omitted.

Iso note that the order of the specified transfer syntaxes for a SOP class or AE in the configuration determines the preference order of proposed transfer syntaxes. Per default all transfer syntaxes are enabled.

Take care that certain presentation context are not practical. Some transfer syntaxes may only be used on certain datasets, and should not be proposed for other datasets. E.g. never propose lossy JPEG compression for 16 bits images as this is not applicable. Currently JPEG Extended is applicable to 12 bits images only (process 4).

5. Media Interchange

5.1. Implementation model

The implementation model identifies the DICOM Application Entities for Media in specific implementation and relates the Application Entities to Real-World Activities.

5.1.1. Application Data Flow Diagram

The Interventional Workstation implements one media application entity:

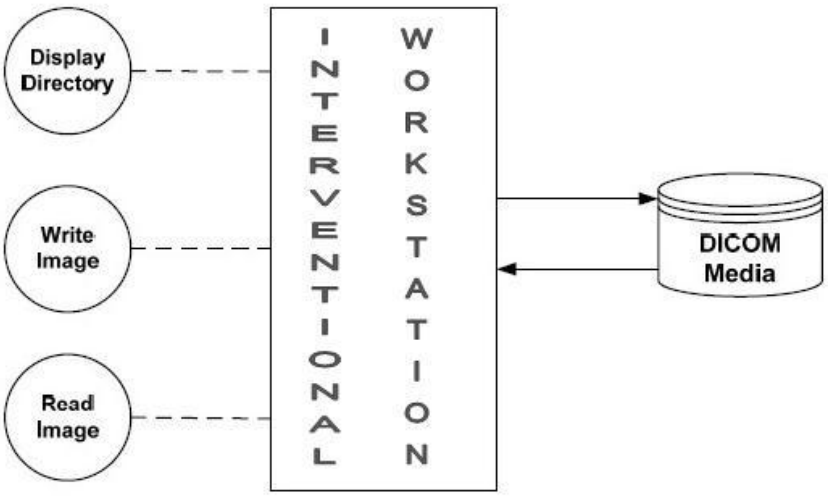

Figure 16: Application Data Flow Diagram

5.1.2. Functional Definitions of AE's

The Interventional Workstation implements the following functions for DICOM media.

- Write a DICOM file-set onto the medium.
- Create a DICOMDIR file.
- Read the DICOMDIR file from the medium.
- Read selected images from the medium.

5.1.3. Sequencing of Real World Activities

Not applicable.

5.2. AE Specifications

This section in the DICOM Conformance Statement specifies a set of Media Application Entities.

5.2.1. Interventional Workstation Media AE Media – Specification

This section contains general policies that apply to all of the Application Entities described in subsequent section.

The Interventional Workstation provides standard conformance to the DICOM interchange option of the media storage service class, and follows the specifications as defined in the DICOM standard – Media Storage and File Format for Data Interchange (PS 3.10) and Media Storage Application Profiles (PS 3.11).

The Interventional Workstation supports multi-patient and multi-session for CD-R media (both reading and writing). For one or more Application Profiles, the following table shows the Real-World Activities and the roles of each of these Real-World Activities.

The Interventional Workstation supports FSC and FSR onto Media for all supported export storage SOP classes and the private storage SOP classes supported by the Interventional workstation. Refer Table 27.

Note:
Read File-set = Display Directory and Read Image
Create File-set = Write Image

Table 74: AE Interventional Workstation Media AE related Application Profiles, RWA activities and roles

Supported Application Profile	Identifier	Real-World Activities	Roles
General Purpose CD-R Interchange	STD-GEN-CD	Create File-set	FSC
		Read File-set	FSR
General Purpose DVD Interchange with JPEG	STD-GEN-DVD-JPEG	Create File-set	FSC
		Read File-set	FSR
General Purpose DVD Interchange with JPEG 2000	STD-GEN-DVD-J2K	Create File-set	FSC
		Read File-set	FSR

5.2.1.1. File Meta Information for the Interventional Workstation Media AE

Table 75: File Meta Information for the Interventional Workstation Media AE

Implementation Class UID	1.3.46.670589.7.8.1.2
Implementation Version Name	1.2.0

5.2.1.2. Real-World Activities

The AE specification contains a description of the Real-World Activities, which invoke the particular AE.

5.2.1.2.1. RWA – Read File-set

This Media Application Entity has a File-set Reader functionality which is described here.

Display Directory

The Interventional Workstation will act as a FSR when reading the directory of the medium. This allows the System Integrator to see the results in an overview of the patients, studies, series presentation states and images.

The Interventional Workstation will not access DICOM media when either:
- Patient ID is absent; or
- Study Instance UID has no value; or
- Series Instance UID has no value.

Read Images

The Interventional Workstation will act as a FSR when reading all/selected images from DICOM media.

5.2.1.2.1.1. Media Storage Application Profile

Refer to the table in section 5.2.1.

Options
Not applicable.

5.2.1.2.2. RWA – Create File-set

This Media Application Entity has a File-set Creator functionality which is described here.

Write Images
The Interventional Workstation acts as an FSC when writing DICOM objects onto DICOM media. The Interventional Workstation can also store private attributes.

When the Interventional Workstation has to write objects to DICOM media, it can encounter the following situation.

The objects were previously received via C-STORE operations. Some attributes in the received images have a zero-length value (type 2 attributes). However, the Application Profile specifies some of these attributes as type 1: they must have a value. In such cases the Interventional Workstation supplies a value for the following attributes (if necessary):
- Patient ID;
- Study ID;
- Series Number;
- Instance number;
- Study Date;
- Study Time.

The mechanism of generating a value for Patient ID is to create a new value (i.e. Study Instance UID) for each new study written to the medium, even if this study belongs to a patient recorded earlier.

Study ID is assigned the value of the first Requested Procedure ID (0040,1001) encountered in the Request Attributes Sequence (0040,0275).

5.2.1.2.2.1. Media Storage Application Profile

Refers to the table in section 5.2.1.

Options
Not applicable.

5.3. Augmented and Private Application Profiles

This section is used for the description of Augmented and Private Application Profiles.

5.3.1. Augmented Application Profiles

Any Augmented Application Profiles used by the Application Entity are described in this section. The rules governing the structure of an Augmented Application Profile are also described.

5.3.1.1. Augmented Application Profile Descriptions

Each Augmented Application Profile has a section that describes the specific features of the Application Profile that make it Augmented.

5.3.1.1.1. SOP Class Augmentations

The addition of Grayscale Softcopy Presentation State SOP class objects implies augmentation of the standard AP.

5.3.1.1.2. Directory Augmentations

Instances of the private SOP classes may be written on the media. This requires a Directory Record Type (0004,1430) with the value “PRIVATE” and configuration of the required Private Record UID. This UID is used to define a non-standard type of Directory Record by reference to its position in a private extension to the DICOM Basic Directory IOD Information Model.

5.3.1.1.3. Other Augmentations

Not applicable.

5.3.2. Private Application Profiles

Not applicable.

5.4. Media Configuration

Not applicable.

6. Support of Character Sets

Any support for character sets in Network and Media services is described here.

Table 76: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO 2022 IR 100	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/01	ISO-IR 100	G1	Supplementary set of ISO 8859
Latin alphabet No. 2	ISO 2022 IR 101	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/02	ISO-IR 101	G1	Supplementary set of ISO 8859
Latin alphabet No. 3	ISO 2022 IR 109	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/03	ISO-IR 109	G1	Supplementary set of ISO 8859
Latin alphabet No. 4	ISO 2022 IR 110	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/04	ISO-IR 110	G1	Supplementary set of ISO 8859
Greek	ISO 2022 IR 126	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/06	ISO-IR 126	G1	Supplementary set of ISO 8859
Arabic	ISO 2022 IR 127	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/07	ISO-IR 127	G1	Supplementary set of ISO 8859
Japanese	ISO 2022 IR 13	ESC 02/08 04/10	ISO-IR 14	G0	JIS X 0201: Romaji
		ESC 02/09 04/09	ISO-IR 13	G1	JIS X 0201: Katakana
Hebrew	ISO 2022 IR 138	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/08	ISO-IR 138	G1	Supplementary set of ISO 8859
Cyrillic	ISO 2022 IR 144	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/12	ISO-IR 144	G1	Supplementary set of ISO 8859
Latin alphabet No. 5	ISO 2022 IR 148	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 04/13	ISO-IR 148	G1	Supplementary set of ISO 8859
Thai	ISO 2022 IR 166	ESC 02/08 04/02	ISO-IR 6	G0	ISO 646
		ESC 02/13 05/04	ISO-IR 166	G1	TIS 620-2533 (1990)
Default repertoire	ISO 2022 IR 6	-	ISO-IR 6	G0	ISO 646
		-	-	-	-
Latin alphabet No. 1	ISO_IR 100	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 100	G1	Supplementary set of ISO 8859
Latin alphabet No. 2	ISO_IR 101	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 101	G1	Supplementary set of ISO 8859
Latin alphabet No. 3	ISO_IR 109	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 109	G1	Supplementary set of ISO 8859
Latin alphabet No. 4	ISO_IR 110	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 110	G1	Supplementary set of ISO 8859
Greek	ISO_IR 126	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 126	G1	Supplementary set of ISO 8859
Arabic	ISO_IR 127	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 127	G1	Supplementary set of ISO 8859
Japanese	ISO_IR 13	-	ISO-IR 14	G0	JIS X 0201: Romaji
		-	ISO-IR 13	G1	JIS X 0201: Katakana
Hebrew	ISO_IR 138	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 138	G1	Supplementary set of ISO 8859
Cyrillic	ISO_IR 144	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 144	G1	Supplementary set of ISO 8859
Latin alphabet No. 5	ISO_IR 148	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 148	G1	Supplementary set of ISO 8859

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Thai	ISO_IR 166	-	ISO-IR 6	G0	ISO 646
		-	ISO-IR 166	G1	TIS 620-2533 (1990)

As can be seen in the table above, Interventional Workspot supports all character sets currently defined by DICOM except for the multi-byte character sets without code extensions.

The preferred character set can be configured. If not configured, the default character set shall be ISO-IR 100.

When an unsupported character set is received it shall be tried and decoded according the preferred character set.

Unsupported characters shall be displayed as “?”.

7. Security

7.1. Security Profiles

The Interventional Workstation does not fully support DICOM security profiles. However, it does support security measures that will be used for secure authentication of a node and for the generation of audit records. The two Interventional Workstation components for security measures are:
- Audit Trail Component
- TLS Component

7.1.1. Security use Profiles

Not applicable

7.1.2. Security Transport Connection Profiles

The TLS Component is a “mode of operation” of Interventional workstation and will be used for nodes that can authenticate each other before they communicate over sockets. TLS can only be used using TCP. Node authentication and encryption are only possible when the node has:
- a “private and public key”;
- a self-signed certificate or certificate signed by a Certificate Authority; and
- a list of certificates with which the system wants to communicate.

Furthermore the TLS component may communicate using the following Cipher Suites:
- TLS_RSA_WITH_NULL_SHA; (Node authentication without encryption)
- TLS_RSA_WITH_3DES_SHA. (Node authentication with encryption)

In case no encryption is used the data is signed and hashed: integrity is present and confidentiality is not present.

Certificates

If two systems communicate with each other, one system will be listening on a port (server node) while the other system sets up a connection (client node). The certificate this server node will send to the other client node is the server certificate. The client node initiates the communication and the certificate that the client node is sending to the server is the client certificate. (Server Client Authentication) The following TLS Certification checks will be done (TLS Handshake). The machine (either server or client) that will send its certificate will choose the certificate according to Common Name (CN) value in the Subject-field. This name is case-sensitive. All present certificates should have unique CN names.

The server verifies:
- that the client certificate is a valid X.509 certificate;
- that the client certificate is either signed by a CA or is self-signed;
- that the client certificate is in the list of trusted certificates;
- that the client certificate is valid (present time is between “Valid From” and “Valid To” fields of the X.509 certificate);
- that the client certificate has the correct purpose (at least the Client Authenticate purpose).

The client verifies:
- that the server certificate is a valid X.509 certificate;
- that the server certificate either is signed by a CA or is self-signed;
- that the server certificate is in the list of trusted certificates;
- that the server certificate is valid (present time is between “Valid From” and “Valid To” fields of the X.509 certificate);
- that the server certificate has the correct purpose (at least Server Authenticate purpose).

In the TLS component no verification is done on:
- revocation of certificates;
- limiting the connection to a limited set of IP-addresses.

Additional information:
The value in the Subject-field is determined in the certificate request. The CA will sign the request in case it accepts the values that are present in the request. The CN value can be: IP-number, hostname or hostname.domain. The value in the CN-field must be equal to the value that is used in making a connection to the server. In case the name is specified as hostname.domain that same value should be specified during connect. In the ideal situation the name-IP-number translation will be dealt with by the DNS in the hospital. This check is case-insensitive.

7.1.3. Digital Signature Profiles

Not applicable

7.1.4. Media Storage Security Profiles

Not applicable

7.1.5. Attribute Confidentiality Profiles

Table 77: De-identified Attributes

Attribute Name	Tag	Replacement Value
Instance Creator UID	0008,0014	No values
Accession Number	0008,0050	No values
Institution Name	0008,0080	No values
Institution Address	0008,0081	No values
Referring Physicians Name	0008,0090	No values
Referring Physician Address	0008,0092	No values
Referring Physician Telephone Numbers	0008,0094	No values
Station Name	0008,1010	No values
Study Description	0008,1030	No values
Series Description	0008,103E	No values
Institutional Department Name	0008,1040	No values
Physicians Of Record	0008,1048	No values
Performing Physician Name	0008,1050	No values
Name Of Physicians Reading Study	0008,1060	No values
Operators Name	0008,1070	No values
Admitting Diagnoses Description	0008,1080	No values
Derivation Description	0008,2111	No values
Patient Name	0010,0010	Value configurable by user.
Patient Birth Date	0010,0030	No values
Patient Birth Time	0010,0032	No values
Patient Sex	0010,0040	No values
Other Patient Ids	0010,1000	No values
Other Patient Names	0010,1001	No values
Patients Age	0010,1010	No values
Patients Size	0010,1020	No values
Patients Weight	0010,1030	No values
Medical Record Locator	0010,1090	No values
Ethnic Group	0010,2160	No values
Occupation	0010,2180	No values
Additional Patient History	0010,21B0	No values
Patient Comments	0010,4000	No values
Device Serial Number	0018,1000	No values

Attribute Name	Tag	Replacement Value
Protocol Name	0018,1030	No values
Study ID	0020,0010	No values
Frame Of Reference UID	0020,0052	New Unique Random value
Synchronization Frame Of Reference UID	0020,0200	New Unique Random value
Image Comments	0020,4000	No values
Request Attributes Sequence	0040,0275	No values
Storage Media File Set ID	0088,0130	No values
Patient ID	0010,0020	New Unique Random value
Study Instance UID	0020,000D	New Unique Random value
Series Instance UID	0020,000E	New Unique Random value
Patient Address	0010,1040	No values
Patient Telephone Numbers	0010,2154	No values

7.1.6. Network Address Management Profiles

Not applicable

7.1.7. Time Synchronization Profiles

The Time Synchronization component of the Interventional Workstation can be configured via Service. The implementation of the component conforms to the basic time synchronization profile of an NTP Client. The NTP Timeserver with which the client synchronizes its time is configured via Service. The NTP Timeserver is an element of Hospital Infrastructure.

7.1.8. Application Configuration Management Profiles

Not applicable

7.1.9. Audit Trail Profiles

The Audit Trail Component is a component of Interventional Workstation and can create messages according to the IHE defined standard. Actors are information systems or components of information systems that produce, manage, or act on categories of information required by operational activities in the enterprise. The Audit Trail Component allows security officers in an institution to audit activities, to detect non-compliant behavior in the enterprise, and to facilitate detection of improper creation, access, modification and deletion of Protected Health Information (PHI), where PHI data is considered as information records (Registration, Order, Study/Procedure, Reports and to a lesser degree Images/Presentation States), and not the flow of information between the systems. This includes information exported to and imported from every secured node in the “secured domain”.
The messages will be created and sent to a syslog server according to the syslog protocol. The time that is used will be the local time of the system. This time should be maintained by implementing a NTP Timeserver daemon on the system. The timeserver and syslog server are elements of the Hospital infrastructure.

7.2. Association Level Security

Interventional Workstation accepts associations only from known applications or an application whose “calling AE Title” is defined in its configuration file. Interventional Workstation will reject association requests from unknown applications, i.e. applications that offer an unknown “calling AE title”. An application entity (AE) is known if – and only if – it is defined during configuration of Interventional Workstation , which is done via the configuration application.

7.3. Application Level Security

Interventional Workstation allows the use of either conventional (non-secure) communication or secure communication based on the Transport Layer Security (TLS) protocol. If configured, Interventional Workstation supports security measures for:
- secure authentication of a node;
- integrity and confidentiality of transmitted data;
- generation of audit trail records;
- access control and user authentication.

8. Annexes of application “Interventional Workstation”

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created by this application.
Miscellaneous conformance notes

Following remarks hold for the standard DICOM SOP Classes:

- The Interventional Workstation supports the following Photometric Interpretations for non-compressed images: MONOCHROME1, MONOCHROME2, PALETTE COLOR, RGB, YBR_FULL, YBR_FULL_422, YBR_PARTIAL_422, YBR_ICT, YBR_RCT.

- The Interventional Workstation can convert Transfer Syntaxes from internal to external values. So Interventional Workstation can convert from internally JPEG compressed/uncompressed pixel data to external JPEG compressed/uncompressed pixel data.

- JPEG Lossless (NH-FOP) compresses all bits denoted by the attribute DICOM_BITS_ALLOCATED. Therefore, any overlays encoded in the pixel data are also encoded and decoded.

- In case of both source (internal) and target compressed pixel data, decompression of the source pixel data and compression to the target pixel data only takes place in the following cases:
1.) The source and target compression formats are different; or:
2.) The source pixel data is multi-frame without a BOT.

- The BOT in compressed pixel data is filled if:
1.) This is explicitly configured; or:
2.) Group length attributes are configured.

Interventional Workstation allows import of mixed series: a series containing a maximum of 2 Secondary Capture images in addition to images from another SOP class.
The next sections describe the SOP-specific attributes.

Notes on Softcopy Presentation State IOD (Section 8.1.1.2)

Depending on the configuration, when the Interventional Workstation imports an image without presentation state object then it may extract and store presentation state object along with this image. The presentation state object will then be part of the same examination as the original image.

If private presentation state information exists then this will be used to create the presentation state object. Depending on the configuration Interventional Workstation may include this private presentation state information on export.

Section 8.1.1.2 specifies only those attributes that are created or modified to export a presentation state object. This presentation state object shall also export all relevant attributes (ref. [DICOM] on Grayscale Softcopy Presentation State IOD) as stored per original image.

Note that the Display Shutter, Overlay Plane and Softcopy VOI LUT modules are moved from the original image to the presentation state object, i.e. the original image will not have any Display Shutter, Overlay Plane and Softcopy VOI LUT data stored. If applicable (i.e. if presentation state is not supported per association/configuration) the image and removed modules may be merged again at export.

If composite images belonging to different series are sent (imported) within one association, then a separate presentation state and series is created for each different composite image series that contains single frame images. Multi-frame images are handled in a slightly different way, as for each separate MF image a presentation state is created. All presentation states that refer to MF images belonging to the same image series are put in the same presentation state series.

In addition, for multi-frame images it can be undesirable to create a presentation state object for each separate MF image during import. This will be the case for a series of X-Ray images that actually contains many X-Ray images that all exist of one single frame. For this reason it can be configured to generate a Presentation State either per image or per series.

This section specifies each IOD created (including private IOD's). It should specify the attribute name, tag, VR, and value. The value should specify the range and source (e.g. user input, Modality Worklist, automatically generated, etc.). For content items in templates, the range and source of the concept name and concept values should be specified. Whether the value is always present or not shall be specified.

Abbreviations used in the IOD tables for the column "Presence of Module" are:

ALWAYS	The module is always present
CONDITIONAL	The module is used under specified condition

Abbreviations used in the Module table for the column "Presence of Value" are:

ALWAYS	The attribute is always present with a value
EMPTY	The attribute is always present without any value (attribute sent zero length)
VNAP	The attribute is always present and its Value is Not Always Present (attribute sent zero length if no value is present)
ANAP	The attribute is present under specified condition – if present then it will always have a value
ANAPCV	The attribute is present under specified condition – if present then its Value is Not Always Present (attribute sent zero length if condition applies and no value is present)
ANAPEV	The attribute is present under specified condition – if present then it will not have any value

The abbreviations used in the Module table for the column "Source" are:

AUTO	The attribute value is generated automatically
CONFIG	The attribute value source is a configurable parameter
COPY	The attribute value source is another SOP instance
FIXED	The attribute value is hard-coded in the application
IMPLICIT	The attribute value source is a user-implicit setting
MPPS	The attribute value is the same as that use for Modality Performed Procedure Step
MWL	The attribute value source is a Modality Worklist
USER	The attribute value source is explicit user input

8.1.1.1. List of created SOP Classes

Table 78: List of created SOP Classes

SOP Class Name	SOP Class UID
Media Storage Directory SOP Class	1.2.840.10008.1.3.10
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66

8.1.1.2. CT Image Storage SOP Class

Table 79: IOD of Created CT Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Patient Study	Patient Study Module	ALWAYS

Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	Image Plane Module	ALWAYS
	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	CT Image Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 80: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Issuer of Patient ID	0010,0021	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 81: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH			AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	

Table 82: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ALWAYS	AUTO	

Table 83: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Performing Physician's Name	0008,1050	PN		ALWAYS	AUTO	
Patient Position	0018,5100	CS		EMPTY	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Laterality	0020,0060	CS		ANAP	AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	

Table 84: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		VNAP	AUTO	

Table 85: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH				
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	CONFIG	
Device Serial Number	0018,1000					
Software Version(s)	0018,1020	LO	1.1.0	ALWAYS	CONFIG	

Table 86: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		VNAP		
Content Date	0008,0023	DA		ANAPCV		
Content Time	0008,0033	TM		ANAPCV		
Acquisition Number	0020,0012	IS		VNAP		
Instance Number	0020,0013	IS		ANAPCV		
Burned in Annotation	0028,0301	CS		VNAP		
Lossy Image Compression	0028,2110	CS		VNAP		

Table 87: Image Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Slice Thickness	0018,0050	DS		VNAP		
Image Position (Patient)	0020,0032	DS		ALWAYS		
Image Orientation (Patient)	0020,0037	DS		ALWAYS		
Slice Location	0020,1041	DS		ANAPCV		
Pixel Spacing	0028,0030	DS		ALWAYS		

Table 88: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	
Bits Stored	0028,0101	US	16	ALWAYS	FIXED	
High Bit	0028,0102	US	15	ALWAYS	FIXED	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 89: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED, SECONDARY	ALWAYS	FIXED	
KVP	0018,0060	DS		VNAP	AUTO	

Acquisition Number	0020,0012	IS		VNAP		
Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	
Bits Stored	0028,0101	US	16	ALWAYS	FIXED	
High Bit	0028,0102	US	15	ALWAYS	FIXED	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	

Table 90: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS	Value 1: 3D-RA:Window Width as set in histogram, converted to HounsField, XperCT Abdominal:60, XperCT Neuro:40	ALWAYS	AUTO	
Window Width	0028,1051	DS		ALWAYS	AUTO	

Table 91: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	FIXED	
Instance Creation Date	0008,0012	DA		ALWAYS		
Instance Creation Time	0008,0013	TM		ALWAYS		
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.2, 1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS		

8.1.1.3. Secondary Capture Image Storage SOP class

Table 92: IOD of Created Secondary Capture Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	CONDITIONAL
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SOP Common Module	ALWAYS
	Extended DICOM and private attributes	CONDITIONAL

Table 93: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		ALWAYS	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 94: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH				
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	

Table 95: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS			AUTO	
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	
Performed Procedure Step Description	0040,0254	LO		VNAP	AUTO	
Related Series Sequence	0008,1250	SQ		VNAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS		
>Purpose of Reference Code Sequence	0040,A170	SQ		EMPTY		

Table 96: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO	Interventional workspot	ALWAYS	FIXED	
Software Version(s)	0018,1020	LO	1.1.0	ALWAYS	FIXED	

Table 97 : SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ANAP		
Conversion Type	0008,0064	CS	WSD	ALWAYS		

Table 98: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS				

Table 99: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		

Planar Configuration	0028,0006	US		ANAP		
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Bits Allocated	0028,0100	US	8	ALWAYS		
Bits Stored	0028,0101	US	8	ALWAYS		
High Bit	0028,0102	US	7	ALWAYS		
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	

Table 100: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	FIXED	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA			AUTO	
Instance Creation Time	0008,0013	TM			AUTO	

Table 101 : Extended DICOM and private attributes for Secondary Capture Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private	2001,0010	LO				
Private	2001,10c1	LO				
Medical Alerts	0010,2000	LO				
Allergies	0010,2110	LO				
Pregnancy Status	0010,21C0	US				
Requested Procedure Description	0032,1060	LO				
Requested Contrast Agent	0032,1070	LO				
Special Needs	0038,0050	LO				
Patient State	0038,0500	LO				
Private	2001,0010	LO				
Private	2001,1063	CS				
Private	2003,0020	LO				
Private	2003,20C3	DT				

8.1.1.4. Multi-frame True color Secondary Capture Image Storage SOP class

Table 102: IOD of Created Multi-frame True color Secondary Capture Image Storage SOP class

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	OPTIONAL
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Multi-Frame Module	ALWAYS
	SC Multi-Frame Image Module	ALWAYS
	Cine Module	CONDITIONAL
	Image Pixel Module	ALWAYS

	SOP Common Module	ALWAYS
Extended DICOM and private attributes	Extended DICOM and private attributes	OPTIONAL

Table 103: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 104: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	
Accession Number	0008,0050	SH				

Table 105: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS			AUTO	
Laterality	0020,0060	CS		ANAP		
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	
Related Series Sequence	0008,1250	SQ		VNAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS		
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP		

Table 106: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ALWAYS	FIXED	
Software Version(s)	0018,1020	LO	1.1.0	ALWAYS	FIXED	

Table 107 : SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment

Modality	0008,0060	CS		ANAP		
Conversion Type	0008,0064	CS	WSD	ALWAYS		

Table 108: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP		
Patient Orientation	0020,0020	CS		ANAPCV		
Burned in Annotation	0028,0301	CS		VNAP		

Table 109: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0000	ALWAYS	AUTO	
Pixel Data	7FE0,0010	OW/OB		ALWAYS	AUTO	
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Planar Configuration	0028,0006	US		ANAP		
Bits Allocated	0028,0100	US	8	ALWAYS		
Bits Stored	0028,0101	US	8	ALWAYS		
High Bit	0028,0102	US	7	ALWAYS		

Table 110: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ALWAYS	AUTO	

Table 111: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	IMPLICIT	
Frame Increment Pointer	0028,0009	AT		ALWAYS	AUTO	

Table 112: SC Multi-Frame Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of frames	0028,0008	IS		ALWAYS		
Instance Number	0028,0013	IS		ALWAYS		

Table 113: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	FIXED	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7.4	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA			AUTO	
Instance Creation Time	0008,0013	TM			AUTO	
Instance Number	0020,0013	IS		ANAP		

Table 114 : Extended DICOM and private attributes for Multi-frame True color Secondary Capture Image Storage SOP class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Private	2001,0010	LO				
Private	2001,10c1	LO				
Requested Procedure ID	0040,1001	SH				
Private	2001,0010	LO				
Private	2001,1063	CS				
Private	2003,0020	LO				
Private	2003,20C3	DT				

8.1.1.5. Grayscale Softcopy Presentation State Storage SOP Class

Table 115: IOD of Created Grayscale Softcopy Presentation State Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
	Presentation Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Presentation State	Presentation State Identification Module	ALWAYS
	Presentation State Relationship Module	ALWAYS
	Presentation State Shutter Module	ALWAYS
	Presentation State Mask Module	ALWAYS
	Displayed Area Module	ALWAYS
	Softcopy VOI LUT module	ALWAYS
	Softcopy Presentation LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 116: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP		
Patient ID	0010,0020	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP		
Patient's Sex	0010,0040	CS		VNAP		

Table 117: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP		
Study Time	0008,0030	TM		VNAP		
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP		
Study Instance UID	0020,000D	UI		ALWAYS		
Study ID	0020,0010	SH		VNAP		

Table 118: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	AUTO	Generated at the time of import.
Series Instance UID	0020,000E	UI		ALWAYS		
Series Number	0020,0011	IS		VNAP		

Table 119: Presentation Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	PR	ALWAYS	AUTO	

Table 120: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP		Philips Medical Systems

Table 121: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	Set to the date at which this presentation state is created in the Interventional Workstation.
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	Set to the date at which this presentation state is created in the Interventional Workstation.
Instance Number	0020,0013	IS		ALWAYS	AUTO	Generated at time of import.
Content Label	0070,0080	CS		ALWAYS	AUTO	New at import
Content Description	0070,0081	LO		EMPTY	AUTO	
Content Creator's Name	0070,0084	PN		EMPTY	AUTO	

Table 122: Presentation State Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	Series Instance UID of the original image.

Table 123: Presentation State Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shutter Presentation Value	0018,1622	US	0	ANAP	AUTO	If required.

Table 124: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	IMPLICIT	
>Displayed Area Top Left Hand Corner	0070,0052	SL	Value 1: 1, Value 2: 1	ALWAYS	IMPLICIT	
>Displayed Area Bottom Right Hand Corner	0070,0053	SL		ALWAYS	IMPLICIT	Set to ImageColumns / ImageRows
>Presentation Size Mode	0070,0100	CS	SCALE TO FIT	ALWAYS	IMPLICIT	
> Presentation Pixel Aspect Ratio	0070,0102	IS		ANAP	IMPLICIT	

Table 125: Softcopy Presentation LU VOI LUT module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Softcopy VOI LUT Sequence	0028,3110	SQ		ALWAYS		
>Window Center	0028,1050	DS		ANAP		
>Window Width	0028,1051	DS		ANAP		

Table 126: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	Generated at the time of import.
Instance Number	0020,0013	IS		ANAP		

Table 127: Extended DICOM and Private attributes Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Requested Procedure ID	0040,1001					
Philips Private	2001,0010		Philips Imaging DD 001			
Philips Private	2001,0011		Philips Imaging DD 002			
Philips Private	2001,1063					
Philips Private	2001,1067					
Philips Private	2001,116C					
Philips Private	2003,0020		Philips X-ray Imaging DD 017			
Philips Private	2003,20C3					

8.1.1.6. X-Ray Angiographic Image Storage SOP Class

Table 128: IOD of Created X-Ray 3D Angiographic Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS

Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	ALWAYS
	Multi-Frame Module	ALWAYS
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	XA Positioner Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 129: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP		
Patient ID	0010,0020	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP		
Patient's Sex	0010,0040	CS		VNAP		

Table 130: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP		
Study Time	0008,0030	TM		VNAP		
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP		
Study Instance UID	0020,000D	UI		ALWAYS		
Study ID	0020,0010	SH		VNAP		

Table 131: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAPCV		
Series Time	0008,0031	TM		ANAPCV		
Modality	0008,0060	CS		ALWAYS		
Performing Physician's Name	0008,1050	PN		ANAPCV		
Related Series Sequence	0008,1250	SQ		ANAP		
>Study Instance UID	0020,000D	UI		ALWAYS		
>Series Instance UID	0020,000E	UI		ALWAYS		
>Purpose of Reference Code Sequence	0040,A170	SQ		VNAP		
Series Instance UID	0020,000E	UI		ALWAYS		
Series Number	0020,0011	IS		VNAP		
Laterality	0020,0060	CS		ANAP		

Table 132: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP		
Institution Name	0008,0080	LO		ANAP		
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO		ANAP		
Device Serial Number	0018,1000	LO		ANAP		
Software Versions	0018,1020	LO		ANAP		

Table 133: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP		
Patient Orientation	0020,0020	CS		ANAP		
Icon Image Sequence	0088,0200	SQ		ANAP		
>Samples per Pixel	0028,0002	US		ALWAYS		
>Photometric Interpretation	0028,0004	CS		ALWAYS		
>Rows	0028,0010	US		ALWAYS		
>Columns	0028,0011	US		ALWAYS		
>Bits Allocated	0028,0100	US		ALWAYS		
>Bits Stored	0028,0101	US		ALWAYS		
>High Bit	0028,0102	US		ALWAYS		
>Pixel Representation	0028,0103	US		ALWAYS		
>Pixel Data	7FE0,0010	UN		ANAP		

Table 134: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rows	0028,0010	US		ALWAYS		
Columns	0028,0011	US		ALWAYS		
>Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		
Pixel Data	7FE0,0010	UN		ANAP		

Table 135: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame Time	0018,1063	DS		ANAP		

Table 136: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS		
Frame Increment Pointer	0028,0009	AT		ALWAYS		

Table 137: X-Ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS		
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Frame Increment Pointer	0028,0009	AT		ANAP		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		
Pixel Intensity Relationship	0028,1040	CS		ALWAYS		

Table 138: X-Ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		VNAP		
Exposure Time	0018,1150	IS		ANAP		
X-Ray Tube Current	0018,1151	IS		ANAP		
Radiation Setting	0018,1155	CS		ALWAYS		

Table 139: XA Positioner Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Positioner Motion	0018,1500	CS		ANAP		
Positioner Primary Angle	0018,1510	DS		VNAP		
Positioner Secondary Angle	0018,1511	DS		VNAP		

Table 140: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS		ANAP		
Window Width	0028,1051	DS		ANAP		

Table 141: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI		ALWAYS		
SOP Instance UID	0008,0018	UI		ALWAYS		
Instance Number	0020,0013	IS		ANAP		

8.1.1.7. X-Ray 3D Angiographic Image Storage

Table 142: IOD of Created X-Ray 3D Angiographic Image Storage Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS

	Enhanced Series Module	ALWAYS
Image	Frame Of Reference Module	ALWAYS
	General Equipment Module	ALWAYS
	Enhanced General Equipment Module	ALWAYS
	Image Pixel Module	ALWAYS
	Acquisition Context Module	ALWAYS
	Multi-frame Functional Groups Module	ALWAYS
	X-Ray 3D Image Module	ALWAYS
	X-Ray 3D Reconstruction Module	ALWAYS
	SOP Common Module	ALWAYS

Table 143: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP		
Patient ID	0010,0020	LO		VNAP		
Patient's Birth Date	0010,0030	DA		VNAP		
Patient's Sex	0010,0040	CS		VNAP		

Table 144: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP		
Study Time	0008,0030	TM		VNAP		
Accession Number	0008,0050	SH		VNAP		
Referring Physician's Name	0008,0090	PN		VNAP		
Study Instance UID	0020,000D	UI		ALWAYS		
Study ID	0020,0010	SH		VNAP		

Table 145: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAPCV		
Series Time	0008,0031	TM		ANAPCV		
Modality	0008,0060	CS		ALWAYS		
Performing Physician's Name	0008,1050	PN		ANAPCV		
Series Instance UID	0020,000E	UI		ALWAYS		
Laterality	0020,0060	CS		ANAP		
Performed Procedure Step Start Date	0040,0244	DA		ANAPCV		
Performed Procedure Step Start Time	0040,0245	TM		ANAPCV		
Performed Procedure Step ID	0040,0253	SH		ANAPCV		

Table 146: Enhanced Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Number	0020,0011	IS		ALWAYS		

Table 147: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS		

Position Reference Indicator	0020,1040	LO		VNAP		

Table 148: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		VNAP		
Institution Name	0008,0080	LO		ANAP		
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO		ANAP		
Device Serial Number	0018,1000	LO		ANAP		
Software Versions	0018,1020	LO		ANAP		

Table 149: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS		Philips Medical Systems
Manufacturer's Model Name	0008,1090	LO		ALWAYS		
Device Serial Number	0018,1000	LO		ALWAYS		
Software Versions	0018,1020	LO		ALWAYS		

Table 150: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Rows	0028,0010	US		ALWAYS		
Columns	0028,0011	US		ALWAYS		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Pixel Representation	0028,0103	US		ALWAYS		
Pixel Data	7FE0,0010	UN		ANAP		

Table 151: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP		
Concept Name Code Sequence	0040,A043	SQ		ALWAYS		

Table 152: Multi-frame Functional Groups Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS		
Content Time	0008,0033	TM		ALWAYS		
Instance Number	0020,0013	IS		ALWAYS		
Number of Frames	0028,0008	IS		ALWAYS		
Shared Functional Groups Sequence	5200,9229	SQ		VNAP		
>Pixel Measures Sequence	0028,9110	SQ		ANAP		
>>Slice Thickness	0018,0050	DS		ANAP		

>>Pixel Spacing	0028,0030	DS		ANAP		
>Frame Anatomy Sequence	0020,9071	SQ		ANAP		
>>Frame Laterality	0020,9072	CS		ALWAYS		
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS		
>>>Code Value	0008,0100	SH		ALWAYS		
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>>>Code Meaning	0008,0104	LO		ALWAYS		
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS		
>Frame Content Sequence	0020,9111	SQ		ANAP		
>Plane Position Sequence	0020,9113	SQ		ANAP		
>>Image Position (Patient)	0020,0032	DS		ANAP		
>Plane Orientation Sequence	0020,9116	SQ		ANAP		
>>Image Orientation (Patient)	0020,0037	DS		ANAP		
>Derivation Image Sequence	0008,9124	SQ		ANAPCV		
>>Source Image Sequence	0008,2112	SQ		VNAP		
>>Derivation Code Sequence	0008,9215	SQ		ALWAYS		
>>>Code Value	0008,0100	SH		ALWAYS		
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS		
>>>Code Meaning	0008,0104	LO		ALWAYS		
>Frame VOI LUT Sequence	0028,9132	SQ		ANAP		
>>Window Center	0028,1050	DS		ALWAYS		
>>Window Width	0028,1051	DS		ALWAYS		
>X-Ray 3D Frame Type Sequence	0018,9504	SQ		ANAP		
>>Frame Type	0008,9007	CS		ALWAYS		
>>Reconstruction Index	0020,9536	US		ALWAYS		
>>Pixel Presentation	0008,9205	CS		ALWAYS		
>>Volumetric Properties	0008,9206	CS		ALWAYS		
>>Volume Based Calculation Technique	0008,9207	CS		ALWAYS		

Table 153: X-Ray 3D Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS		
Content Qualification	0018,9004	CS		ALWAYS		
Samples per Pixel	0028,0002	US		ALWAYS		
Photometric Interpretation	0028,0004	CS		ALWAYS		
Bits Allocated	0028,0100	US		ALWAYS		
Bits Stored	0028,0101	US		ALWAYS		
High Bit	0028,0102	US		ALWAYS		
Burned In Annotation	0028,0301	CS		ALWAYS		
Lossy Image Compression	0028,2110	CS		ALWAYS		
Presentation LUT Shape	2050,0020	CS		ALWAYS		
Pixel Presentation	0008,9205	CS		ALWAYS		
Volumetric Properties	0008,9206	CS		ALWAYS		
Volume Based Calculation Technique	0008,9207	CS		ALWAYS		

Table 154: X-Ray 3D Reconstruction Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
X-Ray 3D Reconstruction Sequence	0018,9530	SQ		ALWAYS		

>Application Name	0018,9524	LO	Interventional Workspot	ALWAYS		
>Application Version	0018,9525	LO	1.1.0	ALWAYS		
>Application Manufacturer	0018,9526	LO	Philips Medical Systems	ALWAYS		
>Algorithm Type	0018,9527	CS		ALWAYS		
>Acquisition Index	0020,9518	US		ALWAYS		

Table 155: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		VNAP		
Patient Orientation	0020,0020	CS		ANAP		
Icon Image Sequence	0088,0200	SQ		ANAP		
>Samples per Pixel	0028,0002	US		ALWAYS		
>Photometric Interpretation	0028,0004	CS		ALWAYS		
>Rows	0028,0010	US		ALWAYS		
>Columns	0028,0011	US		ALWAYS		
>Bits Allocated	0028,0100	US		ALWAYS		
>Bits Stored	0028,0101	US		ALWAYS		
>High Bit	0028,0102	US		ALWAYS		
>Pixel Representation	0028,0103	US		ALWAYS		
>Pixel Data	7FE0,0010	UN		ANAP		

Table 156: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP		
Institution Name	0008,0080	LO		ANAPCV		
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ANAPCV		
Software Version(s)	0018,1020	LO	1.1.0	ANAPCV		

Table 157: X-Ray 3D Angiographic Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
X-Ray 3D Acquisition Sequence	0018,9507	SQ		ALWAYS		
>Detector Type	0018,7004	CS		VNAP		

Table 158: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	FIXED	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7.4	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Creation Date	0008,0012	DA		ANAP	AUTO	
Instance Creation Time	0008,0013	TM		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP		

8.1.1.8. Raw data Storage SOP class

Table 159: IOD of Created Raw Data Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference	OPTIONAL
Equipment	General Equipment Module	ALWAYS
Image	Acquisition Context Module	ALWAYS
	Raw Data Module	ALWAYS
	SOP Common Module	ALWAYS

Table 160 : Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	AUTO	
Patient ID	0010,0020	LO		ALWAYS	AUTO	
Patient's Birth Date	0010,0030	DA		VNAP	AUTO	
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 161 : General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	
Study Time	0008,0030	TM		ALWAYS	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	
Accession Number	0008,0050	SH		EMPTY	AUTO, USER	

Table 162 : General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS		ALWAYS	AUTO	
Performing Physicians' name	0008,1050	PN				
Related Series Sequence	0008,1250	SQ				
>Study Instance UID	0020,000D	UI				
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ				
Series Number	0020,0011	IS		ALWAYS	AUTO	
Laterality	0020,0060	CS		ANAPCV		

Table 163: Frame of Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Frame of Reference UID	0020,0052	UI		ALWAYS	AUTO	
Position Reference Indicator	0020,1040	LO		VNAP	AUTO	

Table 164: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP	FIXED	
Institution Name	0008,0080	LO		ANAP	USER	
Station Name	0008,1010	SH		ANAP		
Manufacturer's Model Name	0008,1090	LO	Interventional Workspot	ANAP	FIXED	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	0018,1020	LO	1.1.0	ANAP	AUTO	

Table 165: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ		VNAP	AUTO	

Table 166: Raw Data Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Creator Version UID	0008,9123	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

Table 167: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.66	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Original Specialized SOP Class UID	0008,001B	UI		VNAP	AUTO	
Instance Creation Date	0008,0012	DA		VNAP	AUTO	
Instance Creation Time	0008,0013	TM		VNAP	AUTO	
Instance Number	0020,0013	IS		VNAP		

Table 168: Extended DICOM and private attributes for Raw Data Image Storage SOP class

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date	0040,A121	DA		VNAP	AUTO	
Time	0040,A122	TM		VNAP	AUTO	
Private	2001,0011	LO		VNAP		
Private	2001,115F	SQ		VANP		
>Laterality	0020,0060	CS		VNAP		
>Position Reference Indicator	0020,1040	LO		VNAP		
>Acquisition Context Sequence	0040,0555	SQ		VNAP		
>Institution Name	0008,0080	LO		VANP		
>Referring Physician's Name	0008,0090	PN		VNAP		
>Patient's Birth Date	0010,0030	DA		VNAP		
>Patient's Sex	0010,0040	CS		VNAP		
>Device Serial Number	0018,1000	LO		VANP		
>Distance Source to Detector	0018,1110	DS		VNAP		
>Requested Procedure ID	0040,1001	SH		VNAP		
>Private	2001,0010	LO		VNAP		
>Private	2001,1063	CS		VANP		

>Private	2003,0020	LO		VNAP		
>Private	2003,2043	UL		VNAP		
>Private	2003,2044	LO		VNAP		
>Private	2003,2047	LO	XtraVision 8.0	VANP		
>Private	2003,2084	SQ		VNAP		
>>Private	2003,0020	LO		VNAP		
>>Private	2003,2047	LO	XtraVision 8.0	VANP		
>>Private	2003,2085	FD		VNAP		
>>Private	2003,2086	FD		VNAP		
>>Private	2003,2087	FD		VNAP		
>>Private	2003,2088	UI		VANP		
>>Private	2003,2089	LO		VNAP		
>>Private	2003,208A	IS		VNAP		
>>Private	2003,208B	DS		VANP		
>>Private	2003,208C	DS		VNAP		

8.1.2. Usage of Attributes from Received IOD

The Interventional Workstation only accepts all valid DICOM IOD's specified in this document. Some SOP Classes will not be viewable because they are application dependent.

8.1.3. Attribute Mapping

For the case of a DICOM image export without PR, the Presentation State information is applied to the image(s) and its attributes are sent out as DICOM composite images as described in Table 83. Three different export modes are possible.

Table 169: Mapping Rules for Exporting Interventional Workstation Images

Interventional Workstation Presentation State	DICOM without PR Standard Composite Image	DICOM without PR Standard Extended Composite Image	DICOM without PR Secondary Capture Image
Presentation State (Identification)	Discard	Add attributes as part of private sequence	Discard
Spatial Transformation	Do not apply; Discard	Do not apply; Add attributes as part of private sequence	Apply on Image
Displayed Area	Do not apply; Discard	Do not apply; Add attributes as part of private sequence	Apply on Image
Modality LUT	Modality LUT Module	Modality LUT Module; Add attributes as part of private sequence	Apply on Image
Presentation LUT	If linear into Presentation shape	If linear into Presentation shape; Add as part of private sequence	Apply on Image
VOI LUT	Into VOI LUT	Into VOI LUT; Add attributes as part of private sequence	VOI LUT Module
Display Shutter	Display Shutter Module	Display Shutter Module; Add attributes as part of private sequence	Not implemented
Overlay Plane	Overlay Plane Module	Overlay Plane Module	Apply on Image
Curve	Curve Module	Curve Module	Discard
Graphic Layer	Discard	Discard; Add attributes as part of private sequence	Apply on Image
Graphic Annotation	Converted into one, separate overlay; Graphic Layer is discarded	Converted into one, separate overlay; Add as part of private sequence	Apply on Image
Other additional or private attributes	Discard	Add as part of private sequence	Discard

8.1.4. Coerced/Modified fields

Upon export of composite instances a de-normalization can take place by assembling data from the various entities in the hierarchy. The selection of the attributes takes place based upon what is present in the Interventional Workstation at the initiation of the export. A description is given in the following subsections per instance level.

Patient

If the patient ID attribute is absent during instance import (has no value – zero-length) the following mapping will take place.

1. When a Patient ID is absent and one of Patient's Name/Patient's Birth Date is absent then a new UID is generated for Patient ID. Otherwise Patient ID is generated by appending "EMPTYPatientID_" + <Patient's Name> + "_" + <Patient's Birth Date>. It will be ensured that all instances belonging to a particular study will get the same Patient ID.

2. For Storage SCP, when two or more SOP Instances have the same Patient ID and different values for Patient's Name/Patient's Birth Date, then a new Patient ID is created by appending "!" + <UID> to the Patient ID. The original Patient ID is added to the Other Patient IDs.

Study

During import, the value of Study ID attribute is determined as follows:

1. Retrieved from the composite image.
2. If not present in the composite image, Study ID is assigned the value of the first Requested Procedure ID (0040,1001) encountered in the Request Attributes Sequence (0040,0275) in the composite image.
3. Otherwise Study ID remains empty.

During Export, in the absence of Study attribute values, the Examination attributes will be taken as a best guess for the following Study attributes.

Table 170: Mapping of Study Attributes

Examination Attribute	Value	DICOM Attribute
Study Date (0008,0020)	Has value	Study date (0008,0020) is sent out
	Not present or has no value	Study date (0008,0020) is filled with Performed Procedure Step Start Date (0040,0244)
Study Time (0008,0030)	Has value	Study Time (0008,0030) is sent out
	Not present or has no value	Study Time (0008,0030) is filled with Performed Procedure Step Start Time (0040,0245)

This implies that upon export of each Examination, within the same Study, different values for these attributes may be sent out. The receiving station, e.g. a PACS system, will apply its own rules for guaranteeing consistency of its own database.

Examination

If all of the Performed Procedure Step attributes in the following table are missing from the composite image, then the mapping is as specified.

Table 171: Mapping of Examination attributes

Performed Procedure Step Attribute	Tag	Composite Image Attribute	Tag
Performed Procedure Step Start Date	0040,0244	Study Date	0008,0020
Performed Procedure Step Start Time	0040,0245	Study Time	0008,0030
Performed Procedure Step ID	0040,0253	Study ID	0020,0010
Performed Procedure Step Description	0040,0254	Study Description	0008,1030

Presentation State Handling

For backward compatibility between Interventional Workstation and DICOM without presentation states, upon export from an Interventional Workstation to DICOM without presentation states, a merge of image definition and image presentation data is required. In the Interventional Workstation model, for one single image multiple presentation states may exist. During

export Interventional Workstation ensures that only one image is sent out by merging the most preferred presentation state data with the image. The most preferred presentation state is selected based on the presentation state label and the time of creation.

8.2. Data Dictionary of Private Attributes

Not applicable.

8.3. Coded Terminology and Templates

Interventional Workstation does not implement any specific support for coded terminology and templates.

8.3.1. Context Groups

Not applicable.

8.3.2. Template Specifications

Not applicable.

8.3.3. Private code definitions

Not applicable.

8.4. Grayscale Image consistency

Interventional Workstation does not implement any specific support for grayscale image consistency.

8.5. Standard Extended/Specialized/Private SOPs

Interventional Workstation supports the following specialized SOP classes.

Table 172: Interventional Workspot Supported Specialized SOP Classes

SOP Class Name	UID
Philips Private Grayscale Softcopy Presentation State Storage	1.3.46.670589.2.2.1.1
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1
Philips Private XRay MF Image	1.3.46.670589.7.8.1618510091
Philips Private Stent Boost WorkItem	1.3.46.670589.7.8.16185100912
Philips Private Live Run WorkItems	1.3.46.670589.7.8.1618510092
Philips Private Run WorkItems	1.3.46.670589.7.8.16185100129
Philips Private Reco WorkItems	1.3.46.670589.7.8.16185100130
Philips Private Three DCA WorkItem	1.3.46.670589.7.8.16185100913
PMS Volume	1.3.46.670589.2.7.1.1
Embedded Document	1.3.46.670589.2.8.1.1

8.6. Private Transfer Syntaxes

Interventional Workstation does not support any private transfer syntaxes.