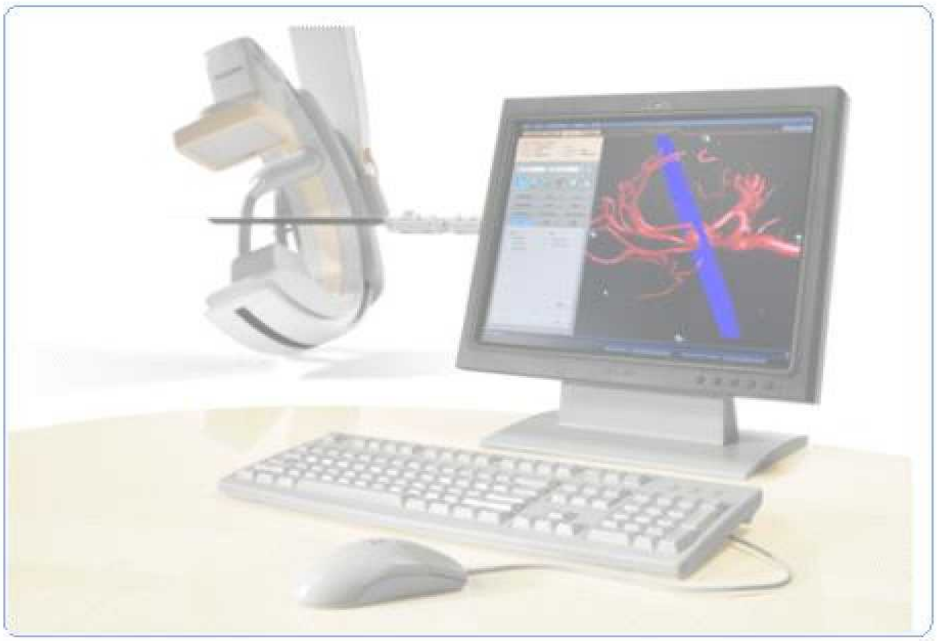
DICOM

Conformance Statement

Allura 3D-RA R6
3D Roadmap R2
MultiModality Roadmap R1
Allura XperCT R2
Allura XperGuide R2
StentBoost R2
StentBoost R3
Allura 3D-CA R3
CTTrueView R2
CTO Navigator



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1. DICOM CONFORMANCE STATEMENT OVERVIEW

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)
Name	**UID**		
Other			
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
Print Management			
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
Query/Retrieve			
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	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
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Transfer			
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
Ambulatory ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
Enhanced SR SOP Class	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	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
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
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 True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	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
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes
Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Specialized PMS Grayscale Softcopy Presentation State Store (Private)	1.3.46.670589.2.2.1.1	Yes	Yes
Specialized PMS X-Ray Image Store (Private)	1.3.46.670589.2.3.1.1	Yes	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes
Workflow Management			
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

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)	Display Directory (DD)
Compact Disk-Recordable				
General Purpose CD-R Interchange	Yes	No	Yes	No

Media Storage Application Profile	File-set Creator (FSC)	File-set Updater (FSU)	File-set Reader (FSR)	Display Directory (DD)
DVD				
General Purpose DVD Interchange with JPEG	Yes	No	Yes	No
General Purpose DVD Interchange with JPEG 2000	Yes	No	Yes	No

2. TABLE OF CONTENTS

3. INTRODUCTION

The introduction specifies product and relevant disclaimers as well as any general information that the vendor feels is appropriate.

3.1. Revision History

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

Table 3: Revision History

Document Version	Date of Issue	Author	Description
01	6-Aug-2009	Karthik K Rao	Draft version
02	15-Sep-2009	Deepak V P	Incorporated the Review Comments from M. Tutelaers

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
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
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

Abbreviation/Term	Explanation
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, Part 1 - 18 (NEMA PS 3.1- PS 3.18),
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 2008) 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.

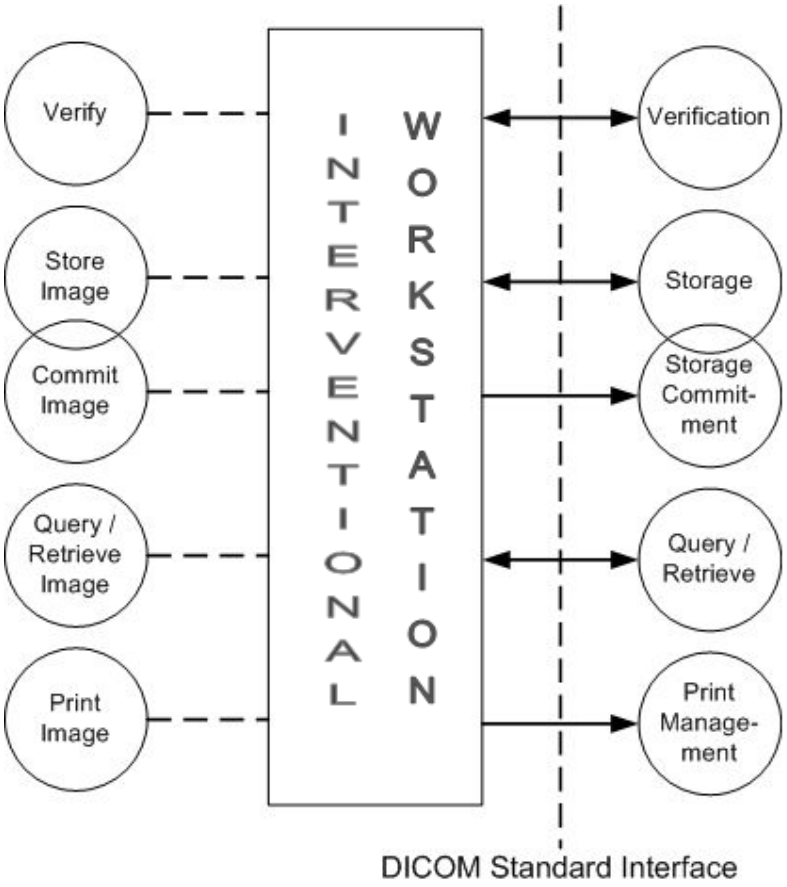

Figure 1: Application Data Flow Diagram

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

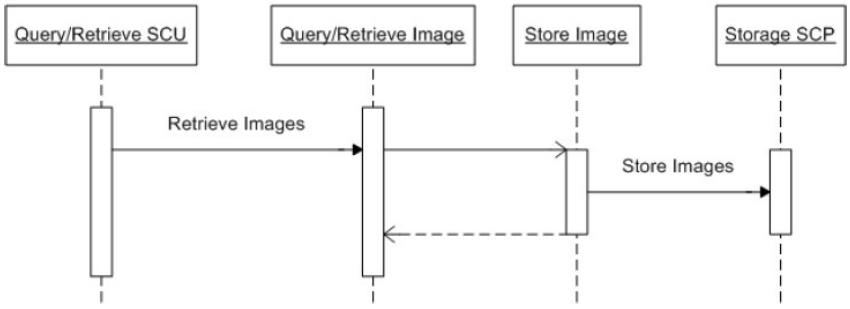

Figure 2: Sequencing of Retrieve

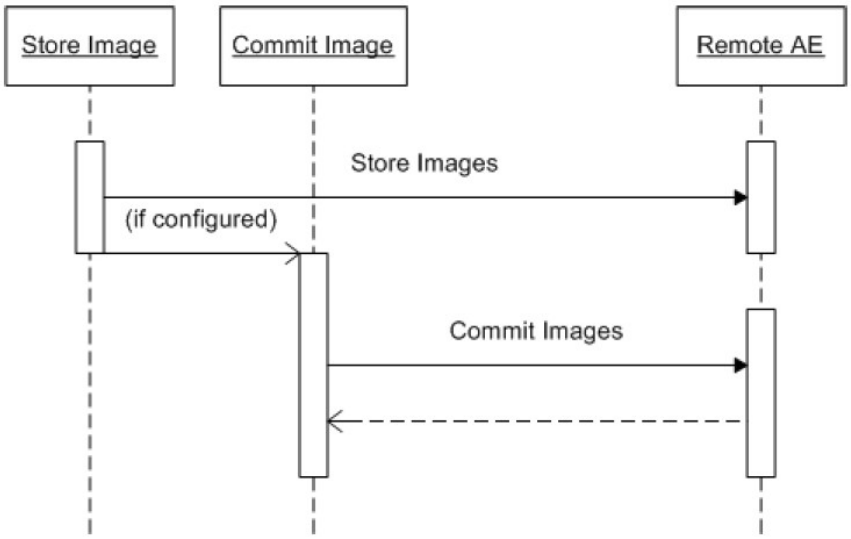

Figure 3: Sequencing of Storage Commitment

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
12-Lead ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
Ambulatory ECG Waveform Storage SOP Class	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes
Comprehensive SR SOP Class	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
Enhanced SR SOP Class	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	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
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
MR Spectroscopy Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
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 True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Patient Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	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
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Plan Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Structure Set Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes

SOP Class Name	SOP Class UID	SCU	SCP
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes
Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Specialized PMS Grayscale Softcopy Presentation State Store (Private)	1.3.46.670589.2.2.1.1	Yes	Yes
Specialized PMS X-Ray Image Store (Private)	1.3.46.670589.2.3.1.1	Yes	Yes
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	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	1.3.46.670589.7.8.8.1
Implementation Version Name	8.1.1.0

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 - applicaton-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)
	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)

Result	Source	Reason/Diagnosis	Behavior
		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].

Source	Reason/Diagnosis	Behavior when received	Sent when
	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 parameterReceived 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

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.

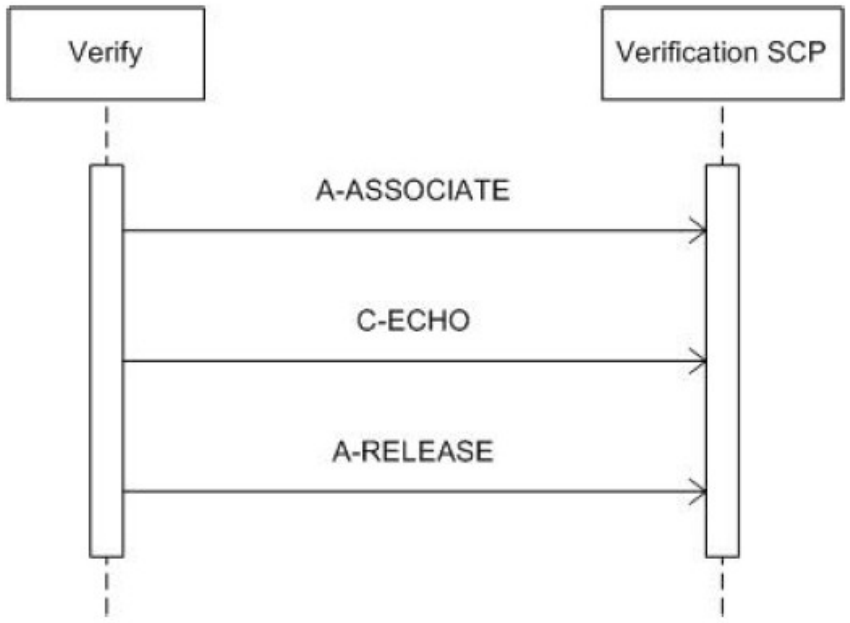

Figure 4: Data Flow Diagram – Verification as SCU

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

Interventional Workstation Network AE accepts associations from systems that wish to query the Interventional Workstation database using the C-FIND command.

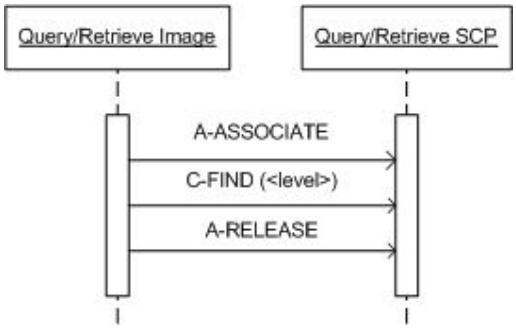

Figure 5: Data Flow Diagram – FIND as SCU

4.2.1.3.2.2. Proposed Presentation Contexts

The presentation contexts 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

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 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.

4.2.1.3.2.3.1. 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,WildCard	
Patient's Name	0010,0010	PN	Single Value,Universal,WildCard	

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

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.
	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.

4.2.1.3.2.4. 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.

4.2.1.3.2.4.1. 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				
Accession Number	0008,0050	SH	Single Value,Universal,WildCard	
Modalities in Study	0008,0061	CS	Single Value,Universal	
Patient ID	0010,0020	LO	Single Value,Universal,WildCard	
Patient's Name	0010,0010	PN	Single Value,Universal,WildCard	
Referring Physician's Name	0008,0090	PN	Single Value,Universal,WildCard	
Study Date	0008,0020	DA	Range,Single Value,Universal	
Study ID	0020,0010	SH	Single Value,Universal,WildCa	

			rd
Study Instance UID	0020,000D	UI	Single Value

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

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.
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

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

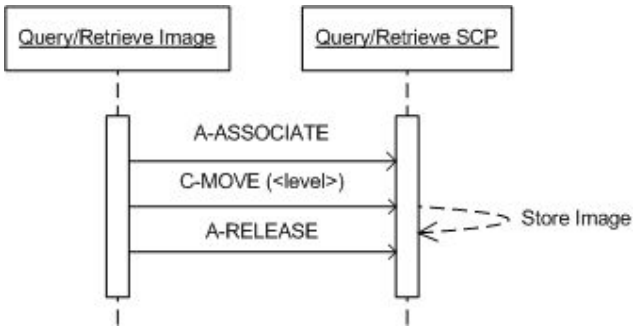

Figure 6: Data Flow Diagram – MOVE as SCU

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		
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

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 Interventional Workstation terminates all incomplete CSTORE sub-operations and returns a status of Cancelled.

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 MOVE Patient Root Information Model as SCU

Patient Root Information Model			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008,0052	CS	
Q/R Image level			
Patient ID	0010,0020	LO	
Series Instance UID	0020,000E	UI	
SOP Instance UID	0008,0018	UI	
Study Instance UID	0020,000D	UI	
Q/R Patient level			
Patient ID	0010,0020	LO	
Q/R Series level			
Patient ID	0010,0020	LO	
Series Instance UID	0020,000E	UI	

Study Instance UID	0020,000D	UI	
Q/R Study level			
Patient ID	0010,0020	LO	
Study Instance UID	0020,000D	UI	

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 have 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.

4.2.1.3.3.4.1. 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 MOVE Study Root Information Model as SCU

Study Root Information Model			
Attribute Name	**Tag**	**VR**	**Comment**
Query/Retrieve Level	0008,0052	CS	
Q/R Image level			
Series Instance UID	0020,000E	UI	
SOP Instance UID	0008,0018	UI	
Study Instance UID	0020,000D	UI	
Q/R Series level			
Series Instance UID	0020,000E	UI	
Study Instance UID	0020,000D	UI	

Q/R Study level			
Study Instance UID	0020,000D	UI	

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 have 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.

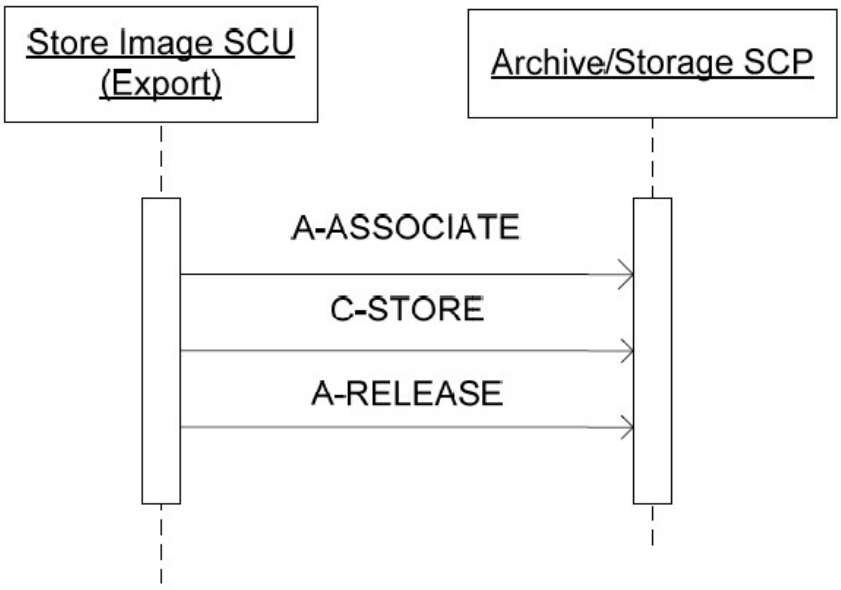

Figure 7: Data Flow Diagram – Store Image – Storage as SCU

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 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		
		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	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		
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 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	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		
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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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	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		
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 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	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		

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	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 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	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		
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		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
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 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		
		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 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	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		
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	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		
		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	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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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 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 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	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		
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Raw Data Storage SOP Class	1.2.840.10008.5.1.4.1.1.66	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		
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	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		
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	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 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	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 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		
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

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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		
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 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		
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 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		
Specialized PMS Grayscale Softcopy Presentation State Store (Private)	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 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		
Specialized PMS X-Ray Image Store (Private)	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		
		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	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		
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 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	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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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 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 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	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		

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.

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 can be configured to stop the transfer of data when the Interventional Workstation receives an unsuccessful store response. Furthermore the Interventional Workstation can be configured in such a way that images can be converted to Secondary Captures.

However the selection of individual frames is supported only for XA images.

The Interventional Workstation will transmit all optional or private image attributes. Also the Interventional Workstation can create or add private 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:

1. X-Ray Angiographic Image Storage
2. Secondary Capture Image Storage
3. Multi-frame True Color Secondary Capture Image Storage
4. X-Ray 3D Angiographic Image Storage
5. Raw Data Storage

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 are not elaborated in this document, since that detail is not important for interoperability.
The object supplier shall be responsible for the presence of DICOM UIDs. The export job will transparently exchange this UID when the image is exported in 'DICOM 2000' format (i.e. separate Presentation State).

3D-RA and XperCT volumes generated by the Interventional Workstation can be exported in one of three formats:

1. X-Ray 3D Angiographic Image Storage: For both archival and viewing
2. Raw Data Storage: For archival only
3. CT image Storage: For viewing only

4.2.1.3.4.3.1. Choice of format for exporting volumes

Among the three formats, X-Ray 3D Angiographic Image Storage has preference. If the X-Ray 3D SOP class is not supported by the SCP, then the choice is as follows:

1. Raw, if the SCP is an archive: Since the primary aim is to backup and restore the data.
2. CT images, if the SCP is a viewing station: CT images are good for viewing. However this data is not restored completely when it's brought back.

4.2.1.3.4.3.2. Miscellaneous Conformance for export of private object

The following choices are supported concerning the export of private objects:
- The object can be exported as a private SOP class instance.
- The object is not exported at all.

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.

Since the media conceptually supports all SOP classes, export of volumes to media is always done using the X-Ray 3D Angiographic Image Storage SOP class.

The next sections describe the SOP-specific attributes.

4.2.1.3.4.3.3. X-Ray 3D Angiographic Image Storage

This section describes the X-Ray 3D Angiographic Image Storage attributes for a volume generated by the Interventional Workstation. It does not apply to volumes generated outside of the workstation.

Table 28: IOD of Created X-Ray 3D Angiographic 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
Series	Enhanced Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Equipment	Enhanced General Equipment Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Acquisition Context Module	ALWAYS
Image	Multi-frame Functional Groups	ALWAYS
Image	X-Ray 3D Image Module	ALWAYS
Image	X-Ray 3D Reconstruction Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 29: 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	If value is null or empty, Birth Date is set to ‘00000000”
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 30: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study Date	0008,0020	DA		ALWAYS	AUTO	

Study Time	0008,0030	TM		ALWAYS	AUTO	
Accession Number	0008,0050	SH		VNAP	AUTO	
Referring Physician's Name	0008,0090	PN		VNAP	AUTO	
Study ID	0020,0010	SH		ALWAYS	AUTO	

Table 31: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Performing Physician's Name	0008,1050	PN		ALWAYS	AUTO	
Patient Position	0018,5100	CS		VNAP	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	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	AUTO	

Table 32: 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 33: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical System	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	XtraVision	ALWAYS	CONFIG	
Software Version(s)	0018,1020	LO	R_8.1	ALWAYS	CONFIG	

Table 34: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	

Table 35: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	

Rows	0028,0010	US		ALWAYS	AUTO	
Columns	0028,0011	US		ALWAYS	AUTO	
Pixel Representation	0028,0103	US	0000	ALWAYS	FIXED	
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO	

Table 36: Acquisition Context Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Acquisition Context Sequence	0040,0555	SQ	(Empty sequence)	ALWAYS	FIXED	

Table 37: Multi-frame Functional Groups Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shared Functional Groups Sequence	5200,9229	SQ		ALWAYS	AUTO	
>Pixel Measures Sequence	0028,9110	SQ		ALWAYS	AUTO	
>>Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
>>Slice Thickness	0018,0050	DS		ALWAYS	AUTO	
>Frame Anatomy Sequence	0020,9071	SQ		ALWAYS	AUTO	
>>Frame Laterality	0020,9072	CS	U	ALWAYS	FIXED	
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS	FIXED	
>>>Code Value	0008,0100	SH	T-D0010	ALWAYS	FIXED	
>>>Coding Scheme Designator	0008,0102	SH	SRT	ALWAYS	FIXED	
>>>Code Meaning	0008,0104	LO	Entire body	ALWAYS	FIXED	The workstation does not know the anatomy, so this is a ‘safe’ option
>Frame VOI LUT Sequence	0028,9132	SQ		ALWAYS	AUTO	
>>Window Center	0028,1050	DS	3D-RA: User-defined; Nero:40, Abdominal:60, Default:0	ALWAYS	AUTO	
>>Window Width	0028,1051	DS	3D-RA: User-defined; Nero:200, Abdominal:800, Default:200	ALWAYS	AUTO	
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS	AUTO	
>Frame Content Sequence	0020,9111	SQ	(Empty sequence)	ALWAYS	FIXED	
>Plane Position Sequence	0020,9113	SQ		ALWAYS	AUTO	
>>Image Position (Patient)	0020,0032	DS		ALWAYS	AUTO	
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS	AUTO	
>>Image Orientation (Patient)	0020,0037	DS		ALWAYS	AUTO	
>Derivation Image Sequence	0008,9124	SQ		ALWAYS	AUTO	
>>Derivation Code Sequence	0008,9215	SQ		ALWAYS	FIXED	
>>>Code Value	0008,0100	SH	113089	ALWAYS	FIXED	
>>>Coding Scheme Designator	0008,0102	SH	DCM	ALWAYS	FIXED	
>>>Code Meaning	0008,0104	LO	Spatial resampling	ALWAYS	FIXED	The closest valid value to ‘Filtered back-projection’ has been taken
>>Source Image Sequence	0008,2112	SQ	(Empty sequence)	ALWAYS	FIXED	
>X-Ray 3D Frame Type Sequence	0018,9504	SQ		ALWAYS	AUTO	
>>Frame Type	0008,9007	CS		ALWAYS	FIXED	Value same as Image Type (0008,0008)
>>Pixel Presentation	0008,9205	CS	MONOCHROME	ALWAYS	FIXED	
>>Volumetric Properties	0008,9206	CS	VOLUME	ALWAYS	FIXED	
>>Volume Based Calculation Technique	0008,9207	CS	NONE	ALWAYS	FIXED	
>>Reconstruction Index	0020,9536	US		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

Content Date	0008,0023	DA		ALWAYS	AUTO	Date of creation of the last Reconstruction
Content Time	0008,0033	TM		ALWAYS	AUTO	Time of creation of the last Reconstruction
Number of Frames	0028,0008	IS		ALWAYS	AUTO	

Table 38: X-Ray 3D Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED, PRIMARY, VOLUME, NONE	ALWAYS	FIXED	
Pixel Presentation	0008,9205	CS	MONOCHROME	ALWAYS	FIXED	
Volumetric Properties	0008,9206	CS	VOLUME	ALWAYS	FIXED	
Volume Based Calculation Technique	0008,9207	CS	NONE	ALWAYS	FIXED	
Content Qualification	0018,9004	CS	PRODUCT	ALWAYS	FIXED	
Burned In Annotation	0028,0301	CS	NO	ALWAYS	FIXED	
Lossy Image Compression	0028,2110	CS	00	ALWAYS	FIXED	
Presentation LUT Shape	2050,0020	CS	IDENTITY	ALWAYS	FIXED	

Table 39: 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	AUTO	
>Detector Type	0018,7004	CS	(Empty)	ALWAYS	FIXED	

Table 40: X-Ray 3D Reconstruction Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
X-Ray 3D Reconstruction Sequence	0018,9530	SQ		ALWAYS	AUTO	
>Application Name	0018,9524	LO	XtraVision	ALWAYS	FIXED	
>Application Version	0018,9525	LO	R_8.1	ALWAYS	FIXED	
>Application Manufacturer	0018,9526	LO	Philips Healthcare (Netherlands)	ALWAYS	FIXED	
>Algorithm Type	0018,9527	CS	FILTER_BACK_PROJ	ALWAYS	FIXED	
>Acquisition Index	0020,9518	US		ALWAYS	AUTO	Refers to item inside X-Ray 3D Acquisition Sequence

Table 41: 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	1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

4.2.1.3.4.3.4. CT Image Storage SOP Class (CT images constructed from 3D-RA and XperCT volumes)

This section describes the CT Image Storage SOP class constructed out of 3D-RA and XperCT volumes. It does not apply to CT images generated outside of the Interventional Workstation.

Note:

1. CT slices generated by the workstation are always ‘Coronal’ slices. This is against the normal convention, where CT images are generated as axial slices.
2. Orientation of CT slices: In the transmitted CT slices, the foot-side of the image is on top.

For CT images generated outside the Interventional Workstation, the data received is stored without changes.

Table 42: IOD of Created CT 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
Frame of Reference	Frame of Reference Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	Image Plane Module	ALWAYS
Image	CT Image Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SOP Common Module	ALWAYS
Image	VOI LUT Module	ALWAYS

Table 43: 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	If value is null or empty, Birth Date is set to ‘00000000”
Patient's Sex	0010,0040	CS		ALWAYS	AUTO	

Table 44: General Study Module

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

Table 45: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	XA	ALWAYS	FIXED	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	

Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Performing Physician's Name	0008,1050	PN		ALWAYS	AUTO	
Patient Position	0018,5100	CS		VNAP	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	
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	
>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	AUTO	

Table 46: 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 47: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical System	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	XtraVision	ALWAYS	CONFIG	
Software Version(s)	0018,1020	LO	R_8.1	ALWAYS	CONFIG	

Table 48: Image Plane Module

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

Table 49: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED, SECONDARY	ALWAYS	FIXED	
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	
KVP	0018,0060	DS		VNAP	AUTO	
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	

Table 50: General Image Module

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

Table 51: 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	FIXED	
Pixel Data	7FE0,0010	OW		ALWAYS	AUTO	

Table 52: 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	1.2.840.10008.5.1.4.1.1.2	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

Table 53: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Window Center	0028,1050	DS	Nero:40, Abdominal:60, Default:0	ALWAYS	AUTO	
Window Width	0028,1051	DS	Nero:200, Abdominal:800, Default:200	ALWAYS	AUTO	

4.2.1.3.4.3.5. 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 54: 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.

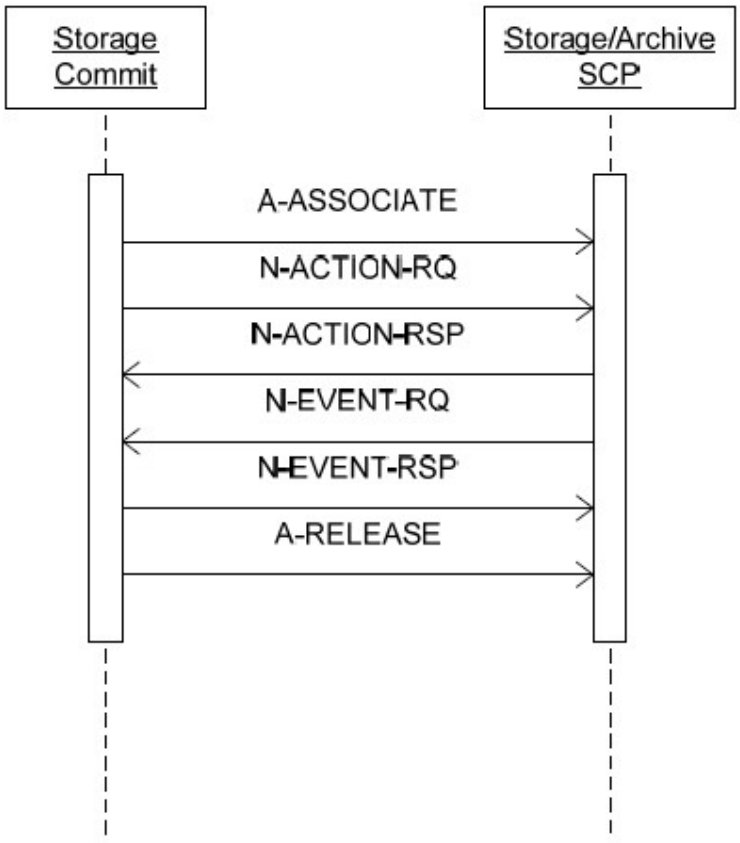

Figure 8: Data Flow Diagram – Commit Image (synchronous)

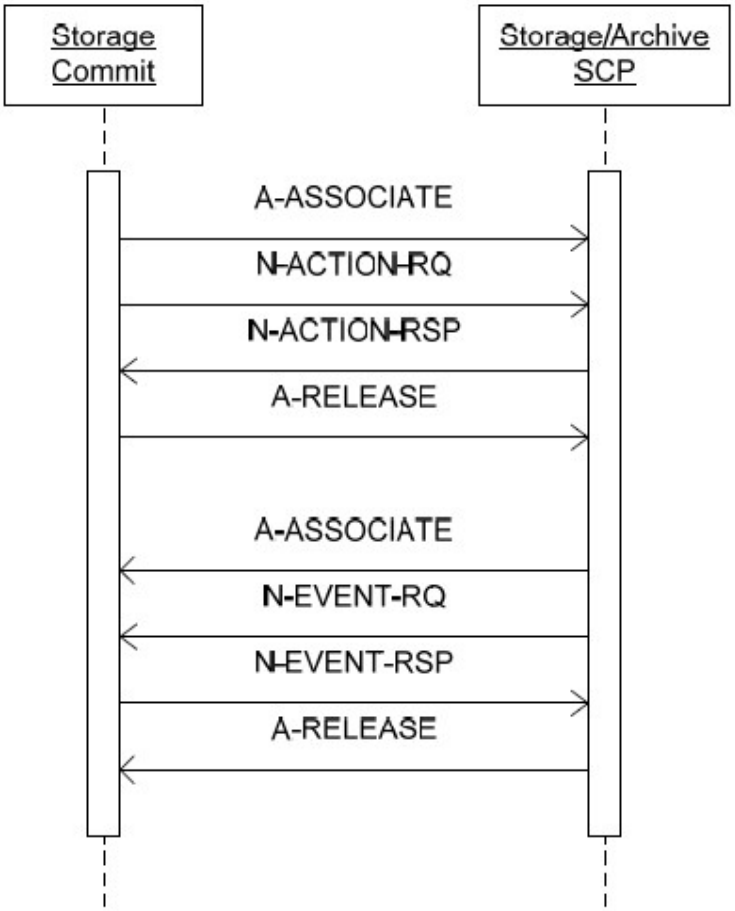

Figure 9: Data Flow Diagram – Commit Image (asynchronous)

4.2.1.3.5.2. Proposed Presentation Contexts

The presentation contexts are defined in the next table.

Table 55: 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 56: 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 57: 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 58: 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.

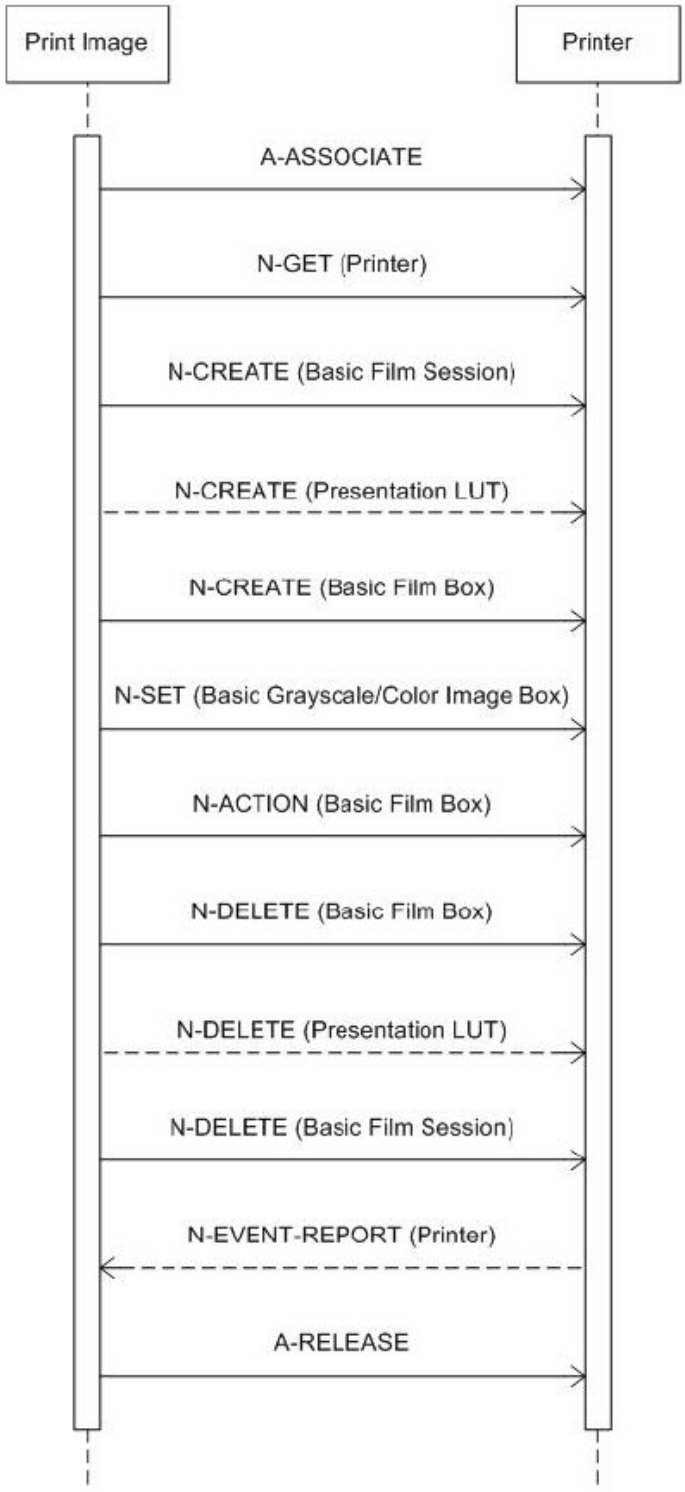

Figure 10: Data Flow Diagram – Print Management as SCU

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, 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 59: 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

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
>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		
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 60: 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	
>Bits Allocated	0028,0100	US		ALWAYS	AUTO	
>Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>High Bit	0028,0102	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS		ALWAYS	IMPLICIT	
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

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

Table 61: 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.

Service Status	Error Code	Further Meaning	Behavior
	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 62: Basic Film Box Presentation Module

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

Table 63: 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 64: 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 65: 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.

Service Status	Error Code	Further Meaning	Behavior
	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 66: 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 67: Basic Film Session Presentation Module

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

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

Table 68: 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 69: 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 70: 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 71: 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 72: 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 73: Basic Film Box Presentation Module

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

Table 74: 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 75: 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.
	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 76: 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.

Service Status	Error Code	Further Meaning	Behavior
	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 printimage 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 77: 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 78: Basic Film Session Presentation Module

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

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

Table 79: 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 80: 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 81: 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	
>Bits Allocated	0028,0100	US		ALWAYS	AUTO	
>Bits Stored	0028,0101	US		ALWAYS	IMPLICIT	
>Columns	0028,0011	US		ALWAYS	IMPLICIT	
>High Bit	0028,0102	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS		ALWAYS	IMPLICIT	
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	IMPLICIT	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	

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

Table 82: 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.

Service Status	Error Code	Further Meaning	Behavior
	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.
	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 83: 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

Event Type Name	Event Type ID	Behavior
		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 84: 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 85: 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. 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 86: 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.

Result	Source	Reason/Diagnosis	Behavior
		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 87: 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).
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].

Source	Reason/Diagnosis	Behavior when received	Sent when
	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 parameterReceived 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.

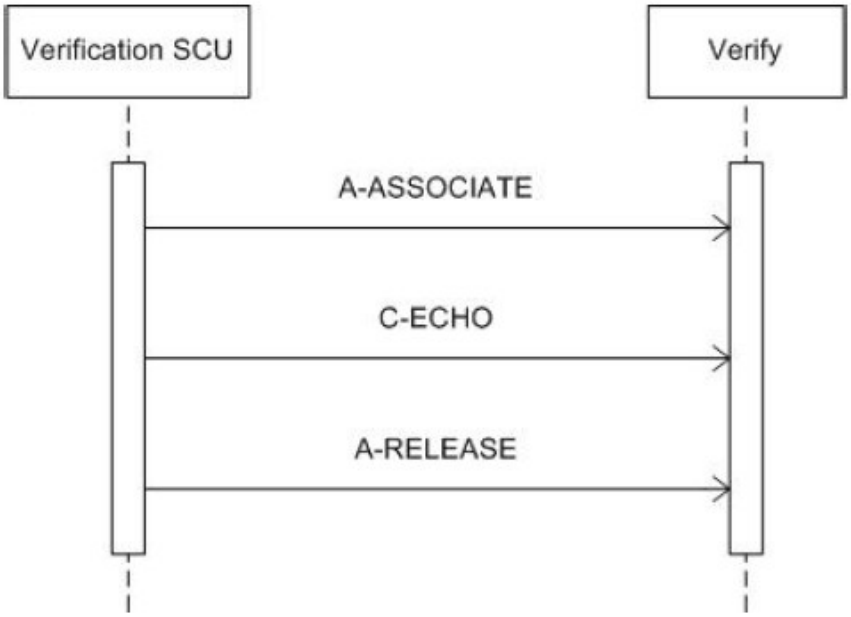

Figure 11: Data Flow Diagram – Verify

4.2.1.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 88: 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 89: 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 implements the Query/Retrieve service class to find selected images per Query/Retrieve SCP. When querying a remote database the Interventional Workstation 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.

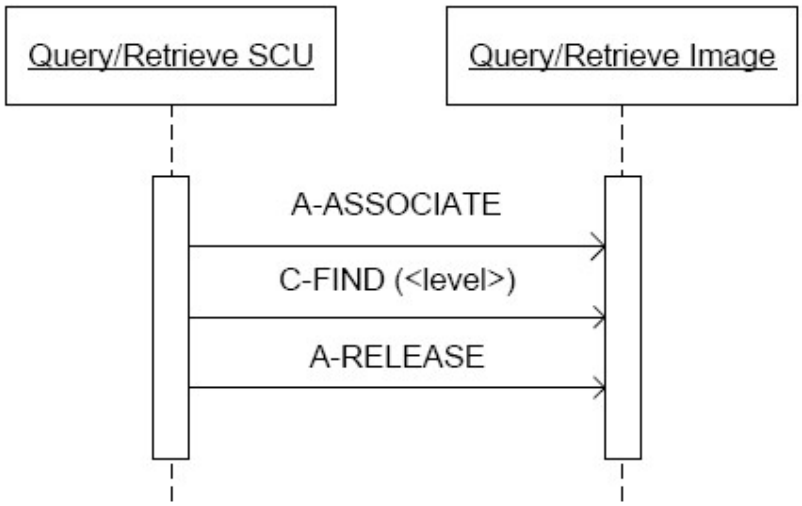

Figure 12: Data Flow Diagram – FIND as SCP

4.2.1.4.2.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 90: 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 91: 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 Image level				
Instance Number	0020,0013	IS	Single Value,Universal	
Patient ID	0010,0020	LO	Single Value	
Series Instance UID	0020,000E	UI	Single Value	
SOP Instance UID	0008,0018	UI	Single Value,Universal	
Study Instance UID	0020,000D	UI	Single Value	
Q/R Patient level				
Patient ID	0010,0020	LO	Single Value,Universal,WildCard	
Patient's Name	0010,0010	PN	Single Value,Universal,WildCard	
Q/R Series level				
Modality	0008,0060	CS	Single Value,Universal	
Patient ID	0010,0020	LO	Single Value	
Series Instance UID	0020,000E	UI	Single Value,Universal	
Series Number	0020,0011	IS	Single Value,Universal,WildCa	

			rd	
Study Instance UID	0020,000D	UI	Single Value	
Q/R Study level				
Accession Number	0008,0050	SH	Single Value,Universal,WildCard	
Patient ID	0010,0020	LO	Single Value	
Study Date	0008,0020	DA	Range,Single Value	
Study ID	0020,0010	SH	Single Value,Universal,WildCard	
Study Instance UID	0020,000D	UI	Single Value,Universal	
Study Time	0008,0030	TM	Range,Single Value	

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 92: 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 Image level				
Instance Number	0020,0013	IS	Single Value,Universal	
Series Instance UID	0020,000E	UI	Single Value	
SOP Instance UID	0008,0018	UI	Single Value,Universal	
Study Instance UID	0020,000D	UI	Single Value	
Q/R Series level				
Modality	0008,0060	CS	Single Value,Universal	
Series Instance UID	0020,000E	UI	Single Value,Universal	
Series Number	0020,0011	IS	Single Value,Universal,WildCard	
Study Instance UID	0020,000D	UI	Single Value	
Q/R Study level				
Accession Number	0008,0050	SH	Single Value,Universal,WildCard	
Study Date	0008,0020	DA	Range,Single Value	
Study ID	0020,0010	SH	Single Value,Universal,WildCard	
Study Instance UID	0020,000D	UI	Single Value,Universal	
Study Time	0008,0030	TM	Range,Single Value	

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

4.2.1.4.3.1. 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).

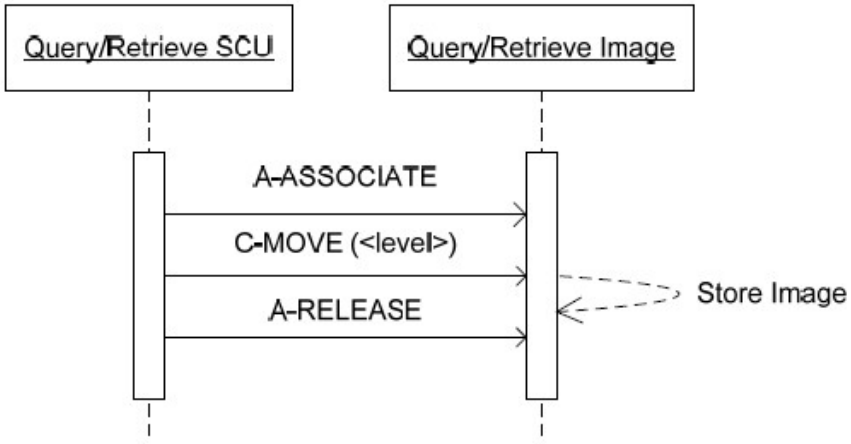

Figure 13: Data Flow Diagram – MOVE as SCP

4.2.1.4.3.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 93: 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 94: 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 95: 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.

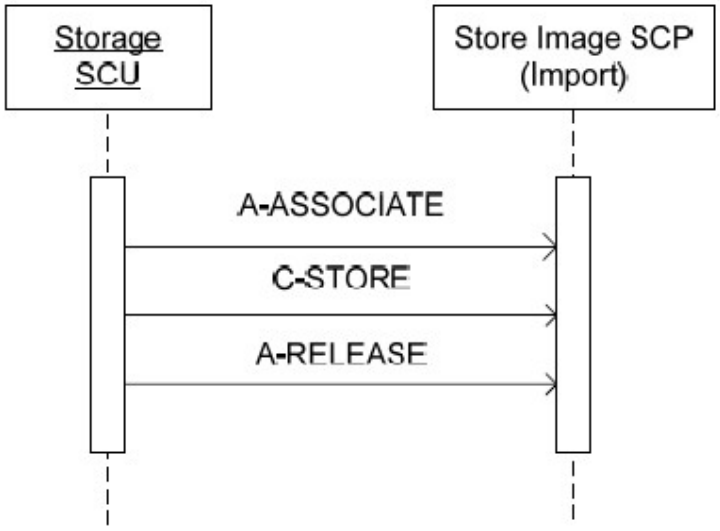

Figure 14: Data Flow Diagram – Store Image – Storage as SCP

4.2.1.4.4.2. Accepted Presentation Contexts

The presentation contexts are defined in the next table.

Table 96: 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		
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		

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		
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		
		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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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		
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		
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		

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		
		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 2000 Image Compression	1.2.840.10008.1.2.4.91		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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 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		
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		
		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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
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		
		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

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		
		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		
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		
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		
Specialized PMS Grayscale Softcopy Presentation State Store (Private)	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		

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		
Specialized PMS X-Ray Image Store (Private)	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		
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		

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
		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 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.

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.

4.2.1.4.4.3. 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 appropriate transfer syntax. This implies that transfer syntax conversions might take place during import. Compressed pixel data is always decompressed and afterwards converted to the “appropriate 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 85. 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 97: 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 visa 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 98: 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)

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 FieldService 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 99: 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	-
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.
Also 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: the Interventional Workstation

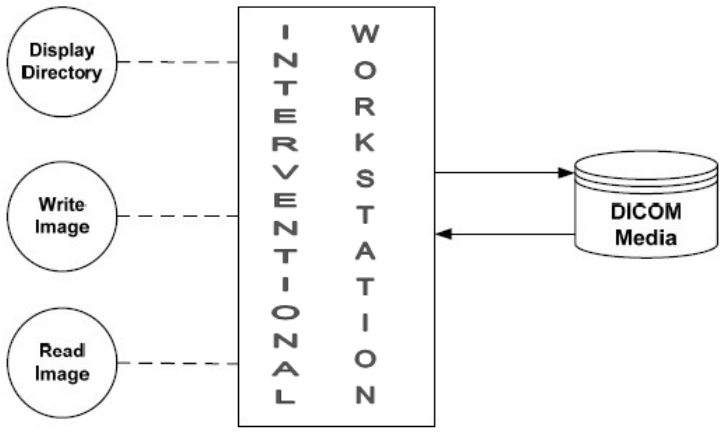

Figure 15: Application Data Flow Diagram

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 - 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.

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

Table 100: AE v 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

Table 101: File Meta Information for the Interventional Workstation

Implementation Class UID	1.3.46.670589.7.8.8.1
Implementation Version Name	8.1.1.0

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.

5.2.1.2.1.1.1. Options

Not applicable.

5.2.1.2.2. RWA - Create File-set

This Media Application Entity has a File-set Creater 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

Refert to the table in section 5.2.1.

5.2.1.2.2.1.1. 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

In the following table an overview is given of some important configuration attributes related to the DICOM behavior of Interventional Workstation

Table 102: Configuration Parameters table

Parameter	Configurable	Default Value
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
SOP Class	Yes	All transfer SOP classes in Interventional Workstation

***Note:** ELE is default, the other syntaxes are optional.

6.

6. SUPPORT OF CHARACTER SETS

Any support for character sets beyond the default character repertoire in Network and Media services is described here.

Table 103: 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

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
		-	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
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 Workstation 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
- Access control and user authentication.

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 sent 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

Not applicable

7.1.6. Network Address Management Profiles

Not applicable

7.1.7. Time Synchronization Profiles

Not applicable

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 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.

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 104: List of created SOP Classes

SOP Class Name	SOP Class UID
Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1
Media Storage Directory SOP Class	1.2.840.10008.1.3.10
Live Run Storage SOP Class	1.3.46.670589.7.8.1618510092
Run Storage SOP Class	1.3.46.670589.7.8.16185100129
Reconstruction Storage SOP Class	1.3.46.670589.7.8.16185100130
XRay MF Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1
Private XRay MF Storage SOP Class	1.3.46.670589.7.8.1618510091
Volume Set Storage SOP Class	1.3.46.670589.2.11.1.1
VRML Storage SOP Class	1.3.46.670589.2.8.1.1

8.1.1.2. Softcopy Presentation State Storage SOP Class

Table 105: IOD of Created Softcopy Presentation State Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Series	General Series Module	ALWAYS
Presentation State	Displayed Area Module	ALWAYS
Presentation State	Graphic Layer Module	CONDITIONAL
Presentation State	Softcopy Presentation LUT Module	ALWAYS
Series	Presentation Series Module	ALWAYS
Presentation State	Presentation State Identification Module	ALWAYS
Presentation State	Presentation State Relationship Module	ALWAYS
Presentation State	Presentation State Shutter Module	CONDITIONAL
Presentation State	SOP Common Module	ALWAYS

Table 106: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	Generated at the time of import.

Table 107: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	IMPLICIT	
>Displayed Area Bottom Right Hand Corner	0070,0053	SL		ALWAYS	IMPLICIT	Set to ImageColumns / ImageRows
>Displayed Area Top Left Hand Corner	0070,0052	SL	Value 1: 1, Value 2: 1	ALWAYS	IMPLICIT	
>Presentation Pixel Spacing	0070,0101	DS		ANAP	IMPLICIT	Set to the value of Pixel Spacing (0028,0030)
>Presentation Size Mode	0070,0100	CS	Value 1: SCALE TO FIT	ALWAYS	IMPLICIT	
>Referenced Image Sequence	0008,1140	SQ		ALWAYS	IMPLICIT	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	IMPLICIT	SOP Class UID of original image.
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	IMPLICIT	SOP Class UID of original image.

Table 108: Graphic Layer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Graphic Layer Sequence	0070,0060	SQ		ALWAYS	IMPLICIT	
>Graphic Layer	0070,0002	CS		ALWAYS	IMPLICIT	
>Graphic Layer Order	0070,0062	IS		ALWAYS	IMPLICIT	

Table 109: Softcopy Presentation LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Shape	2050,0020	CS	Value 1: IDENTITY	ANAP	AUTO	

Table 110: Presentation Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	Value 1: PR	ALWAYS	AUTO	

Table 111: 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
Content Creator's Name	0070,0084	PN		EMPTY	AUTO	
Content Description	0070,0081	LO		EMPTY	AUTO	
Content Label	0070,0080	CS	Value 1: NEW AT IMPORT	ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	Generated at time of import.

Table 112: 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.
>Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO	These refences are constructed from the composite images that are sent in the same association or belong to the same Series.
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 113: Presentation State Shutter Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shutter Presentation Value	0018,1622	US	Value 1: 0	ANAP	AUTO	If required.

Table 114: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	Value 1: 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.
Specific Character Set	0008,0005	CS		ANAP	COPY	

8.1.1.3. Spatial Registration Storage

Table 115: IOD of Created Spatial Registration Storage Instances

Information Entity	Module	Presence Of Module
Series	General Series Module	ALWAYS
Frame of Reference	Frame of Reference Module	ALWAYS
	SOP Common Module	ALWAYS
	Common Instance Reference Module	ALWAYS
Series	Spatial Registration Series Module	ALWAYS
Spatial Registration	Spatial Registration Module	ALWAYS

Table 116: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	Generated at the time of import.

Table 117: 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 118: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	Value 1: 1.2.840.10008.5.1.4.1.1.66.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	Generated at the time of import.
Specific Character Set	0008,0005	CS		ANAP	COPY	

Table 119: Common Instance Reference Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Series Sequence	0008,1115	SQ		VNAP	AUTO	ALWAYS??? Pending DICOM issue.
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Referenced Instance Sequence	0008,114A	SQ		ALWAYS	AUTO	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 120: Spatial Registration Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	Value 1: REG	ALWAYS	AUTO	

Table 121: Spatial Registration 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	
Registration Sequence	0070,0308	SQ		ALWAYS	AUTO	
>Frame of Reference UID	0020,0052	UI		ANAP	AUTO	
>Matrix Registration Sequence	0070,0309	SQ		ALWAYS	AUTO	
>>Matrix Sequence	0070,030A	SQ		ALWAYS	AUTO	
>>>Frame of Reference Transformation Matrix	3006,00C6	DS		ALWAYS	AUTO	
>>>Frame of Reference Transformation Matrix Type	0070,030C	CS		ALWAYS	AUTO	
>>Registration Type Code Sequence	0070,030D	SQ		EMPTY	FIXED	
>>>Code Value	0008,0100	SH		EMPTY	FIXED	
>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Content Creator's Name	0070,0084	PN		VNAP	AUTO	
Content Description	0070,0081	LO		VNAP	AUTO	
Content Label	0070,0080	CS		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	

8.1.1.4. Media Storage Directory SOP Class

Table 122: IOD of Created Media Storage Directory SOP Class Instances

Information Entity	Module	Presence Of Module
Media	Directory Information Module	ALWAYS
Media	File-set Identification Module	ALWAYS

Table 123: Directory Information Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
File-set Consistency Flag	0004,1212	US		ALWAYS	AUTO	
Offset of the First Directory Record of the Root Directory Entity	0004,1200	UL		ALWAYS	AUTO	
Offset of the Last Directory Record of the Root Directory Entity	0004,1202	UL		ALWAYS	AUTO	
Directory Record Sequence	0004,1220	SQ		VNAP	AUTO	
>Directory Record Type	0004,1430	CS		ANAP	AUTO	
>Offset of Referenced Lower-Level Directory Entity	0004,1420	UL		ANAP	AUTO	
>Offset of the Next Directory Record	0004,1400	UL		ANAP	AUTO	
>Record In-use Flag	0004,1410	US		ANAP	AUTO	
>Referenced File ID	0004,1500	CS		ANAP	AUTO	
>Referenced SOP Class UID in File	0004,1510	UI		ANAP	AUTO	
>Referenced SOP Instance UID in File	0004,1511	UI		ANAP	AUTO	
>Referenced Transfer Syntax UID in File	0004,1512	UI		ANAP	AUTO	
>Image Type	0008,0008	CS		ALWAYS	AUTO	
>Instance Number	0020,0013	IS		ALWAYS	AUTO	
>SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
>Specific Character Set	0008,0005	CS		ANAP	AUTO	
>Patient ID	0010,0020	LO		ALWAYS	USER	
>Patient's Birth Date	0010,0030	DA		VNAP	USER	
>Patient's Name	0010,0010	PN		VNAP	USER	
>Patient's Sex	0010,0040	CS		VNAP	USER	
>Specific Character Set	0008,0005	CS		ANAP	AUTO	
>Content Creator's Name	0070,0084	PN		VNAP		
>Content Description	0070,0081	LO		VNAP		
>Content Label	0070,0080	CS		ALWAYS		
>Instance Number	0020,0013	IS		ALWAYS	AUTO	
>Presentation Creation Date	0070,0082	DA		ALWAYS		
>Presentation Creation Time	0070,0083	TM		ALWAYS		
>Specific Character Set	0008,0005	CS		ANAP	AUTO	
>Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	
>>Series Instance UID	0020,000E	UI		ALWAYS		
>>Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS		
>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS		
>Body Part Examined	0018,0015	CS		ALWAYS	IMPLICIT	
>Modality	0008,0060	CS		ALWAYS	AUTO	
>Series Date	0008,0021	DA		ALWAYS	AUTO	
>Series Description	0008,103E	LO		EMPTY	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Series Number	0020,0011	IS		ALWAYS	AUTO	
>Series Time	0008,0031	TM		ALWAYS	AUTO	
>Specific Character Set	0008,0005	CS		ANAP	AUTO	
>Accession Number	0008,0050	SH		VNAP	USER	
>Modalities in Study	0008,0061	CS		ALWAYS	AUTO	
>Referring Physician's Name	0008,0090	PN		VNAP	USER	
>Specific Character Set	0008,0005	CS		ANAP	AUTO	
>Study Date	0008,0020	DA		ALWAYS	AUTO	
>Study Description	0008,1030	LO		VNAP		
>Study ID	0020,0010	SH		ALWAYS	AUTO	

>Study Instance UID	0020,000D	UI		ANAP	AUTO	
>Study Time	0008,0030	TM		ALWAYS	AUTO	

Table 124: File-set Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
File-set ID	0004,1130	CS		ALWAYS	AUTO	
Specific Character Set of File-set Descriptor File	0004,1142	CS		ANAP	AUTO	

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 dependant.

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 125: 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 are 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 126: 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 127: 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 a 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 specialized SOP classes; for the C-STORE services these specialized SOP classes are listed in the following table.

Table 128: Interventional Workstation Supported Specialized SOP Classes as SCU and SCP

SOP Class Name	UID
Specialized PMS Grayscale Softcopy Presentation State Storage	1.3.46.670589.2.2.1.1
Specialized PMS X-Ray Image Storage	1.3.46.670589.2.3.1.1
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.