DICOM Conformance Statement

BV Pulsera R2.3 and Veradius R1.1

Document Number 6760970

PHILIPS

Issued by:
Philips Healthcare Philips Nederland Best

P.O. Box 10.000
5680 DA Best
The Netherlands

Email: dicom@philips.com
Internet: http://www.medical.philips.com/connectivity

Document Number: 6760970
Date: 14-Oct-2010

1. DICOM Conformance Statement Overview

This DICOM Conformance Statement is applicable to BV Pulsera with software release 2.4 or higher and to Veradius with software release 3.2 or higher.
BV Pulsera is a surgical mobile C-arm X-ray image generation system, later referred to as Mobile C-Arm.

The Mobile C-Arm implements a worklist management function to communicate with a RIS/HIS, an export function to transfer image data from the local system to a remote system, and an allocated function to print image data from the local system. The Mobile C-Arm can be configured with one of the following workstation options.

- The integrated ViewForum surgical workstation offers an additional viewing function for images from the local system, images retrieved from remote systems, and images read from DVD or CD. Viewed images can be written to DVD or CD.
- The integrated 3D-RX Workstation offers a 3D reconstruction function and 3D viewing function for images from the local system. Viewed images can be exported. Note that this workstation is only applicable for the BV Pulsera.

The Mobile C-Arm provides the following DICOM data exchange features:

- Print images from the local database on a remote DICOM printer (Standard DICOM package).
- Export images from the local database to a remote DICOM database (Standard DICOM package).
- Automatically Commitment of stored DICOM objects on a remote DICOM system (Push Model) (Advanced DICOM package).
- Querying an remote information system for a Modality Worklist (Advanced DICOM package).
- Sent Modality Performed Procedure Step details to a remote information system (Advanced DICOM package).
- Querying and Retrieval of data objects from a remote DICOM system (ViewForum Surgical Workstation).
- Storage and Retrieval of DICOM objects per removable media (ViewForum Surgical Workstation).
- Export of CT Images and Secondary Captures Images (3D-RX Workstation).

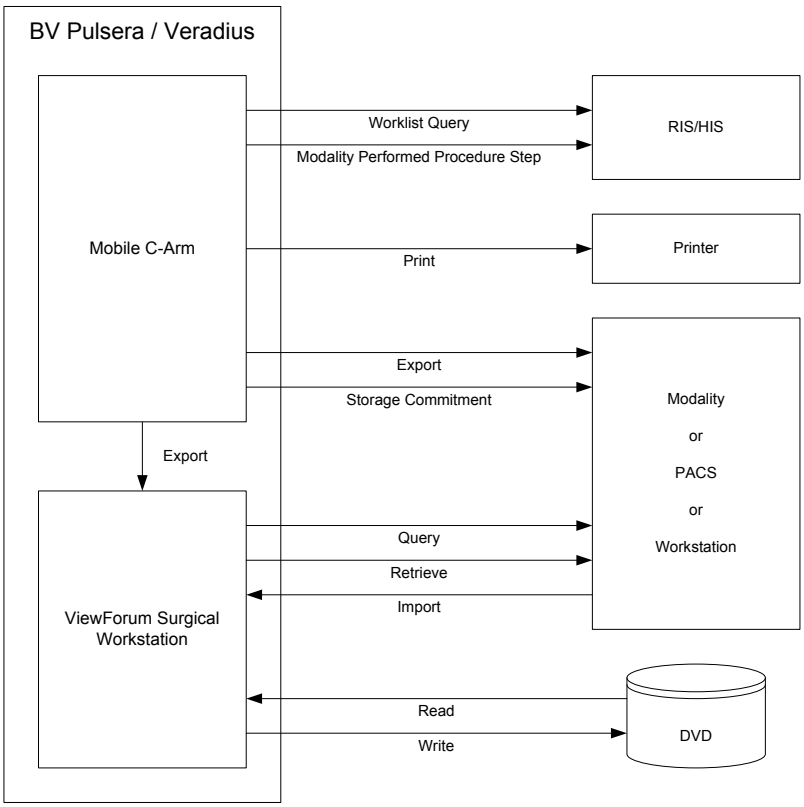

Figure 1: DICOM System Overview of Mobile C-Arm with integrated ViewForum Surgical Workstation

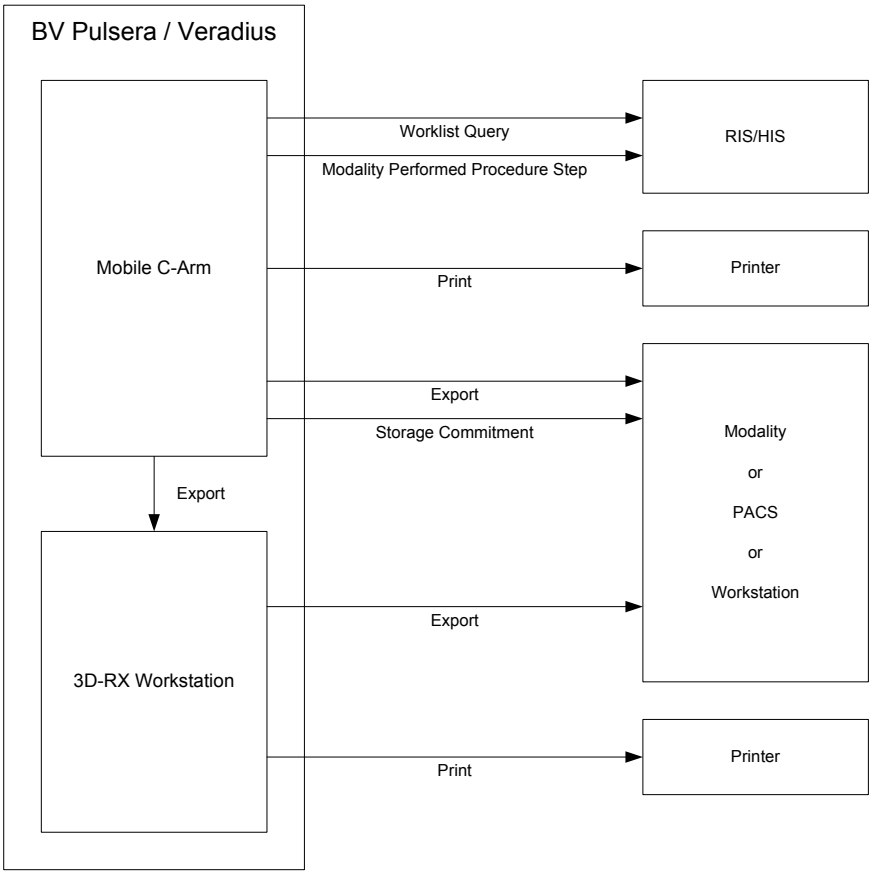

Figure 2: DICOM System Overview of Mobile C-Arm with integrated 3D-RX Workstation

Table 1 provides an overview of all network services as provided by the Mobile C-Arm.

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 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	No
Patient Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	No

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	**UID**		
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
PatientStudy Only QR Info. Model - FIND SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.1	Yes	No
PatientStudy Only QR Info. Model - MOVE SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.2	Yes	No
Transfer			
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	No	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	No	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	No	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Specialized PMS X-Ray Image Store (Private)	1.3.46.670589.2.3.1.1	No	Yes
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	No	Yes
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	No	Yes
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	No	Yes
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	No	Yes
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	No	Yes
Perfusion (Private)	1.3.46.670589.5.0.13	No	Yes
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	No	Yes
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	No	Yes
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	No	Yes
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	No	Yes
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9	No	Yes
Workflow Management			
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No

The Transfer SCU (for X-Ray Angiographic and Secondary Capture Image Storage) and Print Management SCU services are part of the Standard DICOM package. (Note that this package is optional though required for DICOM functionality.)

The optional Workflow Management SCU services are part of the Advanced DICOM package.

The optional integrated ViewForum Surgical Workstation includes Transfer SCP and Query/Retrieve SCU services.

The optional integrated 3D-RX Workstation includes dedicated Transfer SCU (for CT and Secondary Capture Image Storage) and Print Management SCU services.

Table 2 provides an overview of all media services as provided by the Mobile C-Arm. Media services are provided only when ViewForum Surgical Workstation or 3D-RX Workstation options are present. As medium CD, DVD and USB are supported.

After data is written to DVD, the DVD should be finalized after the burning process has finished. A finalized DVD can now be read on mostly every DVD reader.

Note that DVD-R and DVD-RW medium can be Read by the ViewForum Surgical Workstation AE, but these media are not supported for Writing. After the data is written to DVD, the DVD will be automatically finalized after the burning process has finished.

Currently the Mobile C-Arm supports the FSC service for CD-R(W) and DVD+R(W) media; and the FSR service accepts for DVD both DVD+R(W) and DVD-R(W) media and CD-R(W). Not supported are the Media DVD-R and DVD-RW.

Note also that if data is written to DVD+R and DVD-R, on the 3D-RX Workstation AE, the media is not automatically finalized. Finalizing of DVD must be done manually by the user.

Table 2: Media Services

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

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	Status	Description
00	06-August-2010	Proposal	Initial version
01	04-Oct- 2010	Proposal	
02	14-Oct- 2010	Approved	

3.2. Audience

This Conformance Statement is intended for:

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

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

3.3. Remarks

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

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

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

- **New versions of the DICOM Standard**
  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and

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

Abbreviations/ Terms	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 Communication in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
DVD	Digital Versatile Disc
DX	Digital X-Ray
EBE	Explicit VR Big Endian
ELE	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	Implicit VR Little Endian
IOD	Information Object Definition
ISIS	Information System - Imaging System
MOD	Magneto-Optical Disk
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDU	Protocol Data Unit
RF	X-Ray Radiofluoroscopic
RIS	Radiology Information System
RT	Radiotherapy
RWA	Real-World Activity

Abbreviations/ Terms	Explanation
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
USB	Universal Serial Bus
USMF	Ultrasound Multi-frame
VFRB	ViewForum Release Bulletin
VR	Value Representation
WLM	Worklist Management
XA	X-Ray Angiographic

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 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 2009) plus all the supplements and correction items that have been approved as Final Text.

[IHE] Integrating the Healthcare Enterprise Technical Framework Revision 5.4 Radiological Society of North America (RSNA), Inc.
820 Jorie Boulevard, Oak Brook, IL, United States of America.

[VFRB] Release Bulletin ViewForum Surgical Workstation, PMSN.

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

For the Mobile C-Arm three application entities may be distinguished: the Mobile C-Arm AE, the ViewForum Surgical Workstation AE, and the 3D-RX Workstation AE.

The **Mobile C-Arm AE** is responsible for all networking functionality concerning acquisitions by the Mobile C-Arm. It consists of two packages (ref. Section 1): the (optional) Standard DICOM package, and the Advanced DICOM package as an optional extension to the Standard DICOM package. Using both packages the Mobile C-Arm AE offers the following functionality.

The operator can sent a worklist query. (Get Worklist)

The operator can select and perform an examination (may be scheduled per worklist), resulting in an MPPS record. Then the operator can export the acquisition images; the images in the examination may be exported as separate Secondary Capture images, as XA images, or as print job. If applicable, the Mobile C-Arm AE automatically sent a Storage Commitment request for those images. (Export)

In service mode the service operator can verify application level communication.

The **ViewForum Surgical Workstation AE** is intended to view images. Those images may be imported from the Mobile C-Arm AE, or from a foreign storage SCU. (Query/Retrieve Image)

The ViewForum Surgical Workstation AE can also be used to store images on DICOM media. (Media Interchange)

The **3D-RX Workstation AE** is intended to perform 3D reconstructions on the XA images received from the Mobile C-Arm AE of BV Pulsera system. The resulting images may be exported as Secondary Capture images or CT images.

The Mobile C-Arm can work both on-line and off-line. Therefore MPPS data and acquired images that have to be transferred by the Mobile C-Arm AE are put in a queue (so only for RWA (Export)). If during queuing the Mobile C-Arm is connected to the network, they are transferred immediately and deleted from the queue.

If the Mobile C-Arm is disconnected from the network, then Query/Retrieve and Worklist Queries are disabled. MPPS, storage, and print jobs will stay in the queue. When the system is re-connected to the network, transfer of the queued items is resumed on explicit user request.

The networking application data flow is shown in the following figures.

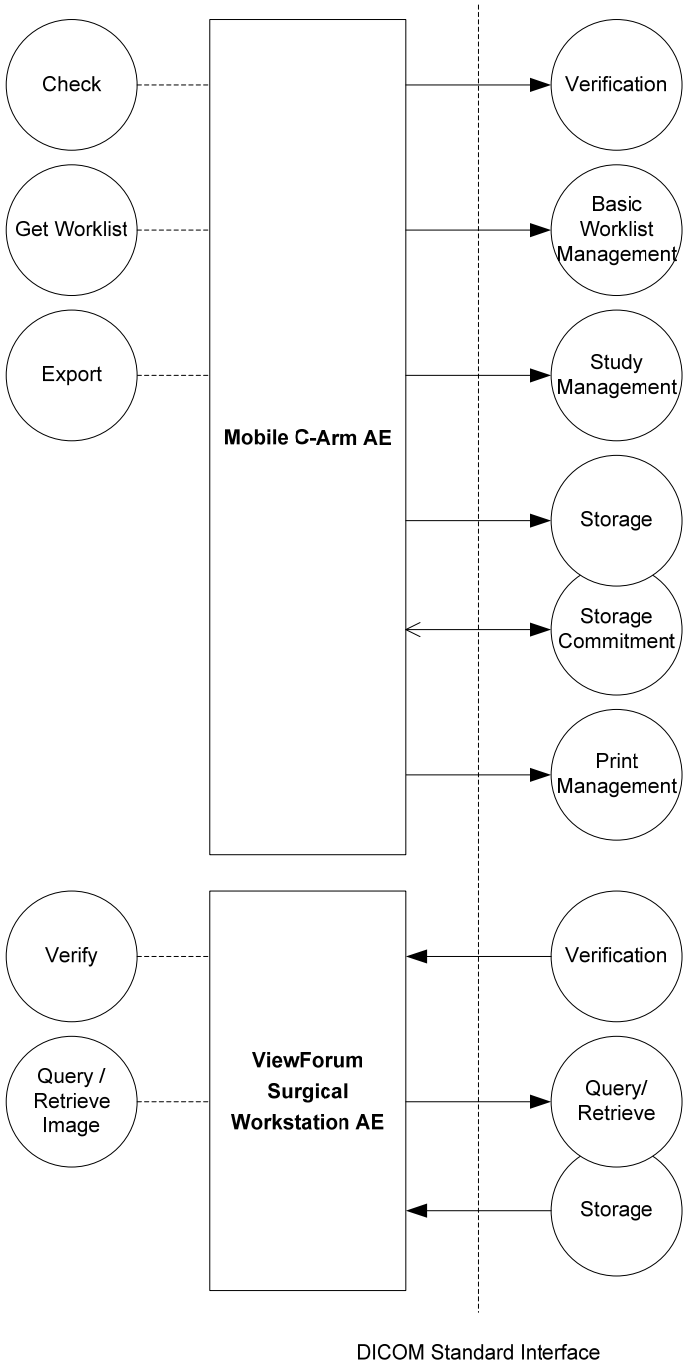

Figure 3: Application Data Flow Diagram Mobile C-Arm AE with integrated ViewForum Surgical Workstation AE

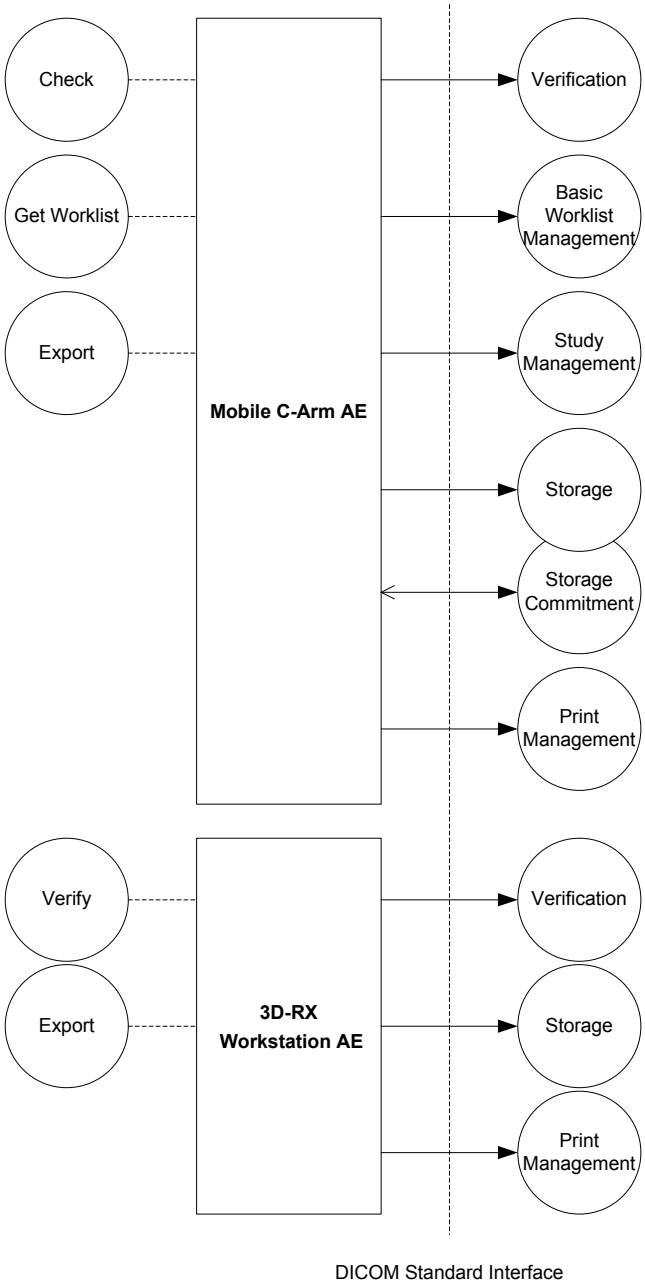

Figure 4: Application Data Flow Diagram Mobile C-Arm AE with integrated 3D-RX Workstation AE

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 Mobile C-Arm AE

The Mobile C-Arm AE has no SCP implementation, and will act as SCU for Verification (Check), for Basic Worklist Management (Get Worklist), and for Study Management, Storage and Storage Commitment, and Print Management (Export). Initiated by the operator the Mobile C-Arm AE will propose the required presentation contexts for an association with the peer SCP. For Storage Commitment the Mobile C-Arm AE may accept associations for asynchronous event reports (Export).

4.1.2.2. Functional Definition of ViewForum Surgical Workstation AE

The ViewForum Surgical Workstation AE can retrieve and view images from a foreign storage SCU (Query/Retrieve Image). The operator initiates a query request and selects examinations from the query response. The operator initiates a retrieve request for the selected images. The ViewForum Surgical Workstation AE as storage SCP waits for an association to import the requested images (Query/Retrieve Image).

4.1.2.3. Functional Definition of 3D-RX Workstation AE

The 3D-RX Workstation AE will act as SCU for Verification (Verify) and Storage (Export) to export images after 3D reconstruction, either as Secondary Capture image or as CT image.

4.1.3. Sequencing of Real World Activities

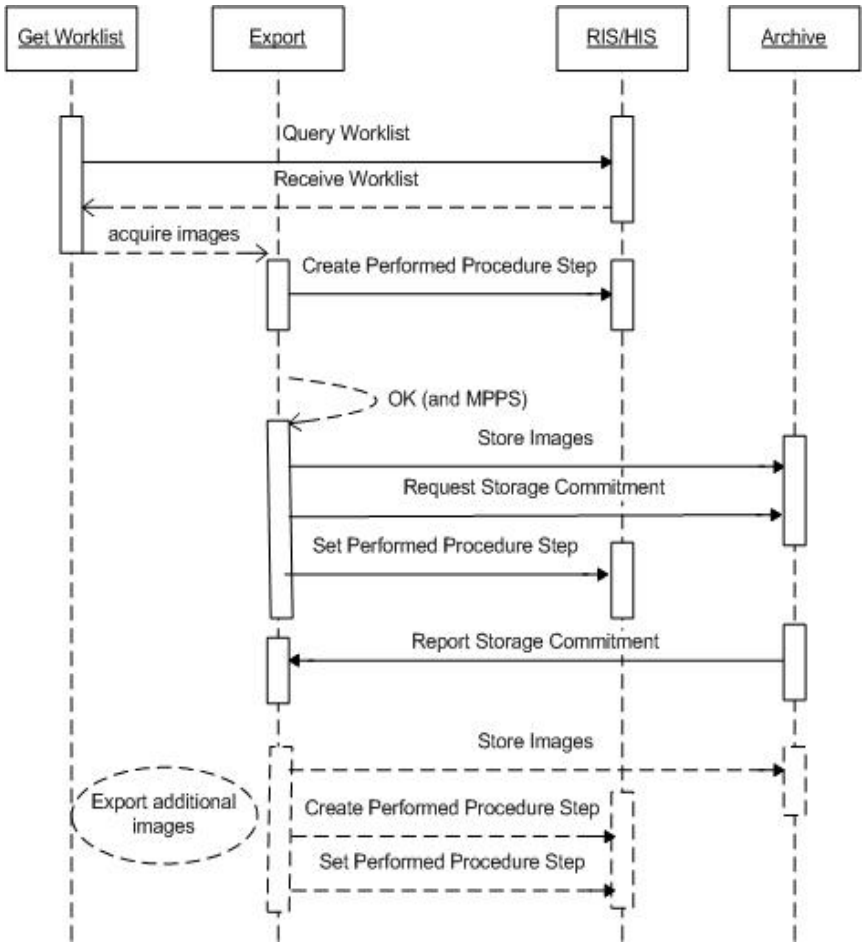

Figure 5: Typical Acquisition Archive Storage Sequencing Constraint

The following figures describe the sequencing constraints of some typical acquisitions per scheduled procedure step.

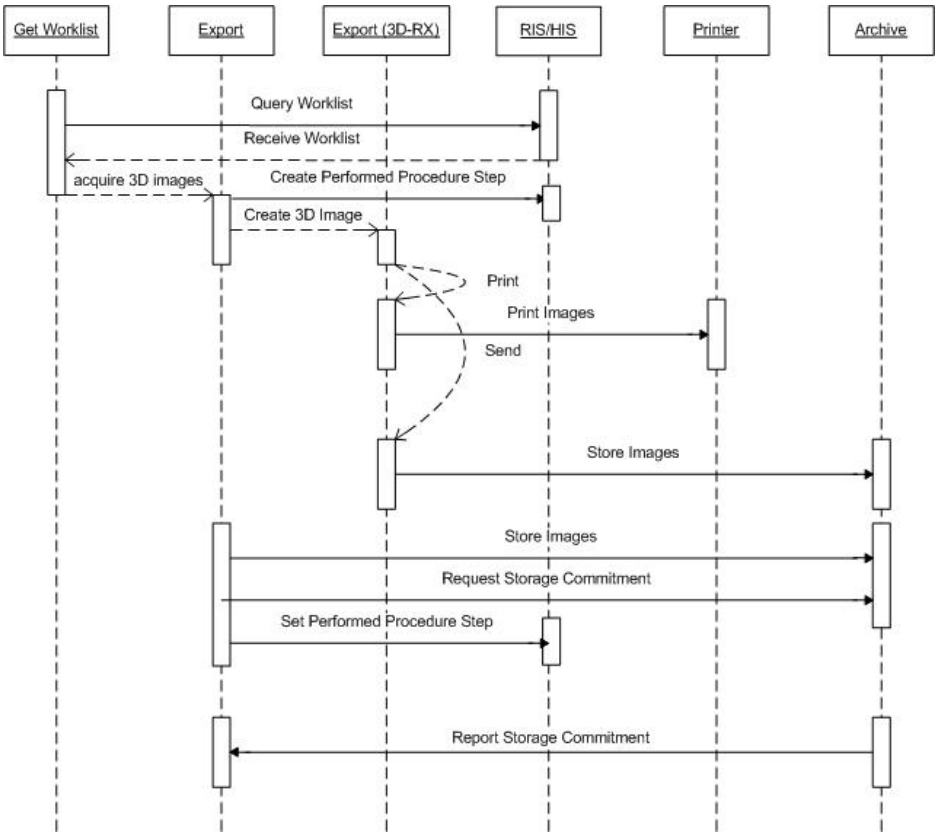

Figure 6: Typical 3D Acquisition Sequencing Constraint

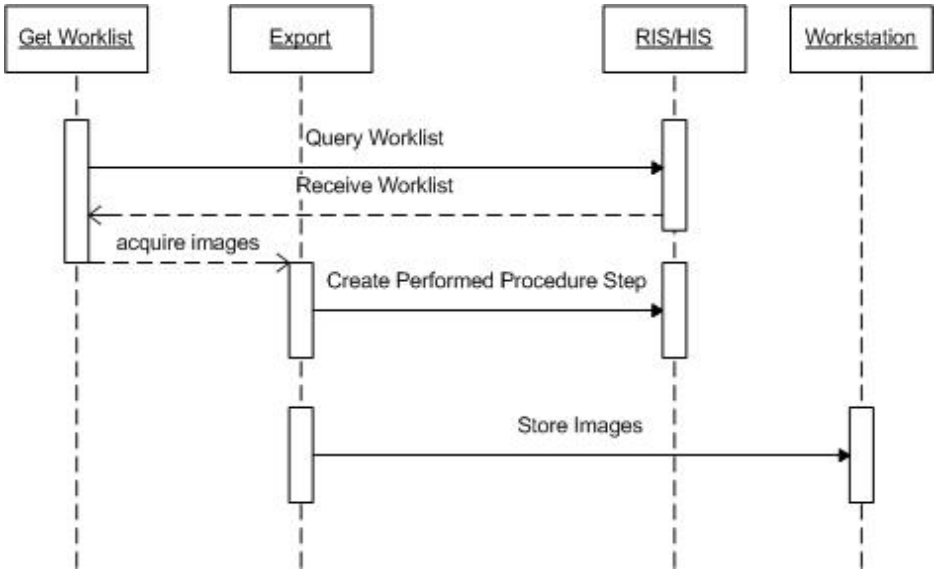

Figure 7: Typical Acquisition Workstation Storage Sequencing Constraint

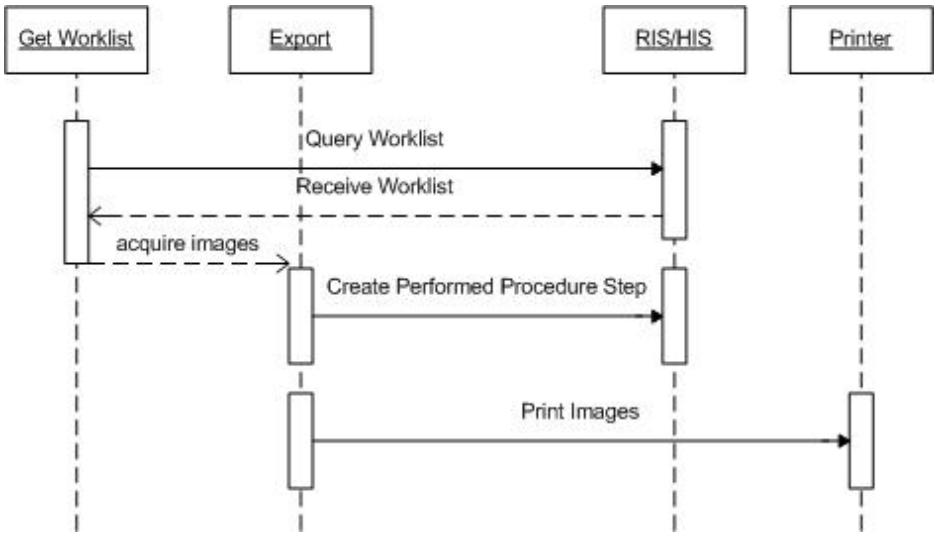

Figure 8: Typical Acquistion Print sequencing constraint

Note that an acquisition may also be started manually, i.e. without using a worklist.

The following figure describes the sequencing constraints of a typical Query/Retrieve action.

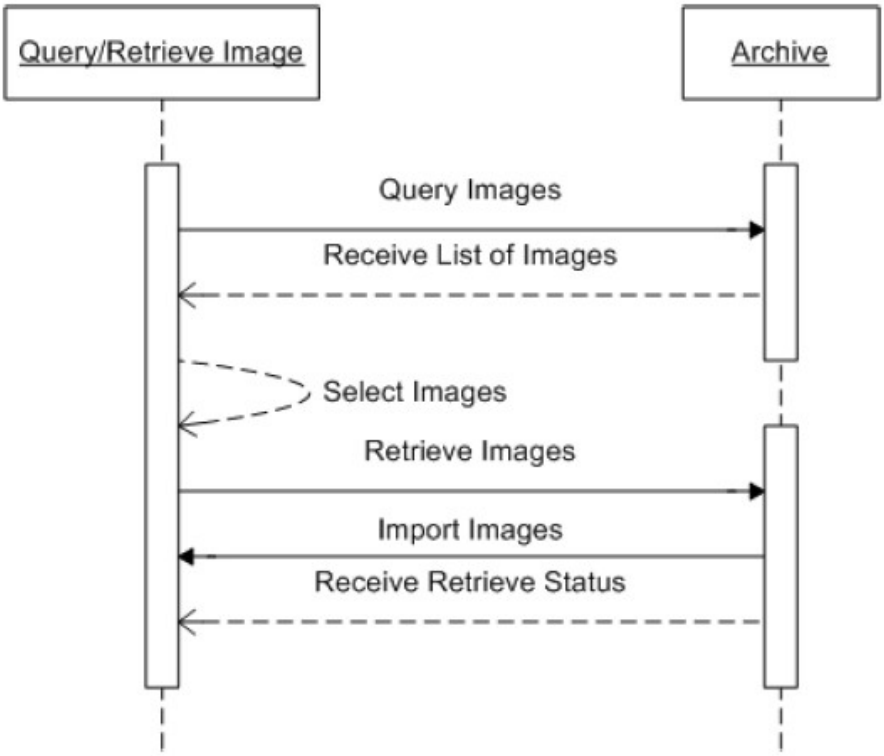

Figure 9: Typical Query/Retrieve Sequencing Constraint

Note that Import Images will be using a separate association.

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. Mobile C-Arm 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 Mobile C-Arm AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	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 that any SOP class specific behavior is documented later in this conformance statement in the applicable SOP class 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 name for DICOM 3.0 is always proposed.

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.

The Mobile C-Arm AE may initiate and accept one association simultaneously.

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

Description	Value
Maximum number of simultaneous associations	1

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

Description	Value
Maximum number of simultaneous associations	1

4.2.1.2.3. Asynchronous Nature

The Mobile C-Arm AE only supports asynchronous operations for Storage Commitment report. It will not perform asynchronous window negotiation.

4.2.1.2.4. Implementation Identifying Information

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

Table 9: DICOM Implementation Class and Version for Mobile C-Arm AE

Implementation Class UID	1.3.46.670589.7.70.3.2
Implementation Version Name	PH Mobile C R3.2

4.2.1.2.5. Communication Failure Handling

The behavior of the AE during communication failure is summarized in Table 10.

Table 10: Communication Failure Behavior

Exception	Behavior
General	In the DFI the error is logged including a description of the problem. Those are the standard notifications when an association cannot be established.
Not connected	MC_NETWORK_SHUTDOWN is logged e.g. ARTIM Timeout

4.2.1.3. Association Initiation Policy

This describes the conditions under which the AE will initiate an association.
The behavior of the AE during DICOM communication failure is summarized in Table 11.

Table 11: DICOM Command Communication Failure Behavior

Exception	Behavior
Association setup failure	The association is aborted and the command marked as failed. The reason is logged and reported in the log file.
Network timeout behavior	See section 4.4.2 for corresponding configurable time to wait parameters.

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

4.2.1.3.1.1. Description and Sequencing of Activities

In service mode the Mobile C-Arm AE can sent a verification request (C-ECHO) to verify application level communication. This verification is initiated on a separate service system by using the "Check" function of the BV Scope program.

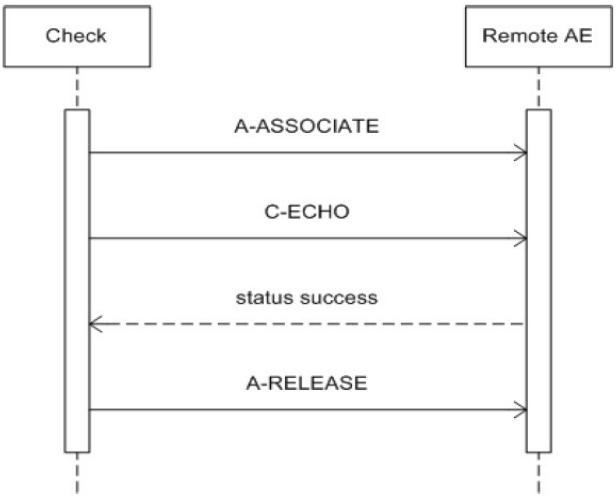

Figure 10: Sequencing of RWA Check

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 12: 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 Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.1.3.1.3. SOP Specific Conformance for Verification SOP Class

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

The Mobile C-Arm AE provides standard conformance to the 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 for Verification is reported in this section.

Table 13: 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 – Modality worklist as SCU

4.2.1.3.2.1. Description and Sequencing of Activities

The Mobile C-Arm AE can send a modality worklist query (C-FIND) to update the Mobile C-Arm worklist.

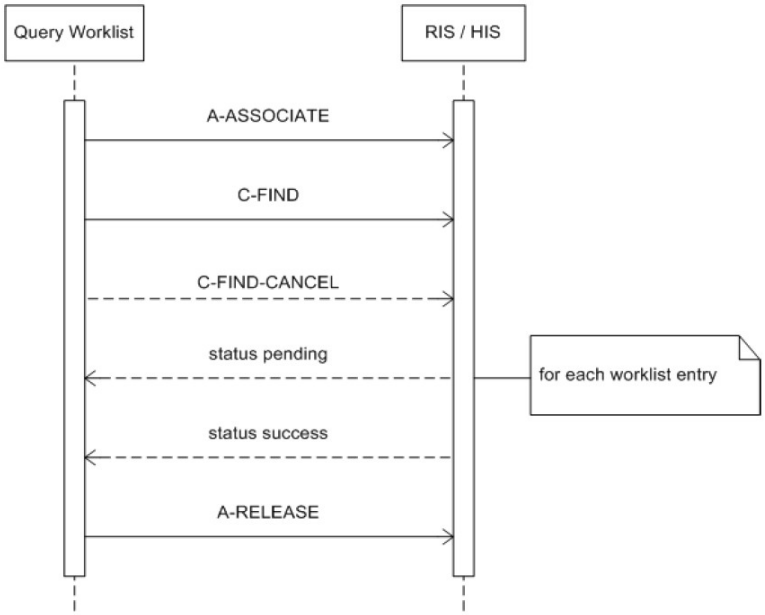

Figure 11: Sequencing of RWA Get Worklist

The worklist query is initiated by selecting "Get Worklist". Then the Mobile C-Arm AE opens an association and sent a modality worklist query. The BWLM SCP (RIS/HIS) returns the applicable worklist; a response with status Pending is received for each new entry, the final response has status Success. After the final response the Mobile C-Arm AE releases the association.

The contents of the received worklist are compared with the contents of the previous worklist. In case there are any changes, the Mobile C-Arm patient file is updated. A unique match of the following attributes identifies a worklist entry.

Table 14: Matching Criteria for Identifying Worklist Entries

Attribute Name	Tag
Scheduled Procedure Step ID	(0040,0009)
Accession Number	(0008,0050)
Requested Procedure ID	(0040,1001)

If none of these identification attributes are present the received worklist entry will be ignored.

4.2.1.3.2.2. Proposed Presentation Contexts

The possible presentation contexts are defined in next table.

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

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	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 Modality Worklist Information Model - FIND SOP Class

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

The Mobile C-Arm AE provides standard conformance to the Modality Worklist SOP class.

The Mobile C-Arm AE can contain a number of 100 worklist entries. If the sum of current and new worklist entries exceeds 100 then not all new entries added before the Mobile C-Arm AE releases the association. The Mobile C-Arm AE will show a message stating that the maximum number of examinations was reached.

Mobile C-Arm provides a broad query with the following attributes.

- Scheduled Procedure Step Start Date
- Modality Type
- Scheduled Station AE Title
- Scheduled Station Name

These query attributes are fixed. These fixed attributes can be configured.

A patient specific worklist query is possible with the following attributes.

- Scheduled Procedure Step Start Date (configured value)
- Modality Type (configured value)
- Patient Name
- Patient ID
- Accession Number
- Requested Procedure ID

The table in the next section provides the list of query attributes, displayed attributes, required attributes, etc. The table also lists the type of matching for the query attributes.

4.2.1.3.2.3.1. Dataset Specific Conformance for Modality Worklist Information Model - FIND C-FIND SCU

Detail regarding the Dataset Specific response behavior will be reported in this section.
The table below should be read as follows:

Attribute Name: Attributes supported to build a Modality Worklist Request Identifier.
Tag: DICOM tag for this attribute.
VR: DICOM VR for this attribute.
M: Matching Keys for (automatic) Worklist Update.
R: Return Keys. An "X" will indicate that this attribute as matching key can be used.

Q: Interactive Query Key. An "X" will indicate that this attribute as matching key can be used.
D: Displayed Keys. An "X" indicates that this Worklist attribute is displayed o the user during a patient registration dialog.
IOD: An "X" indicates that this Worklist attribute is included into all object Instances created during performance of the related Procedure Step.
Type of matching: The following types of matching exists:
Single Value Matching
List of UID Matching
Wild Card Matching
Range Matching
Sequence Matching
Universal Matching

Table 16: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Patient Identification Module									
Other Patient IDs	0010,1000	LO		X			X	Universal	-
Other Patient Names	0010,1001	PN		X		X	X	Universal	-
Patient ID	0010,0020	LO		X	X	X	X	Single Value	-
Patient's Name	0010,0010	PN		X	X	X	X	WildCard	-
Patient Demographic Module									
Patient's Birth Date	0010,0030	DA		X		X	X	Universal	-
Patient's Birth Time	0010,0032	TM		X			X	Universal	-
Patient's Sex	0010,0040	CS		X		X	X	Universal	-
Patient's Weight	0010,1030	DS		X			X	Universal	-
Patient Medical Module									
Allergies	0010,2110	LO		X		X		Universal	-
Medical Alerts	0010,2000	LO		X		X		Universal	-
Special Needs	0038,0050	LO		X		X		Universal	-
Visit Relationship Module									
Referenced Patient Sequence	0008,1120	SQ		X			X		-
>Referenced SOP Class UID	0008,1150	UI		X			X	Universal	-
>Referenced SOP Instance UID	0008,1155	UI		X			X	Universal	-
SOP Common Module									
Specific Character Set	0008,0005	CS		X			X		-
Scheduled Procedure Step Module									
Scheduled Procedure Step Sequence	0040,0100	SQ		X					-
>Modality	0008,0060	CS		X	X	X	X	Single Value	-
>Pre-Medication	0040,0012	LO		X		X		Universal	-
>Requested Contrast Agent	0032,1070	LO		X		X		Universal	-
>Scheduled Performing Physician's Name	0040,0006	PN		X		X		Universal	-
>Scheduled Procedure Step Description	0040,0007	LO		X		X	X	Universal	-
>Scheduled Procedure Step ID	0040,0009	SH		X			X	Universal	-
>Scheduled Procedure Step Location	0040,0011	SH		X		X		Universal	-
>Scheduled Procedure Step Start Date	0040,0002	DA		X	X	X		Range	-
>Scheduled Procedure Step	0040,0003	TM		X		X		Universal	-

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
Start Time									
>Scheduled Station AE Title	0040,0001	AE		X	X			Single Value	-
>Scheduled Station Name	0040,0010	SH		X		X		Single Value	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		X			X		-
>>Code Meaning	0008,0104	LO		X			X	Universal	-
>>Code Value	0008,0100	SH		X			X	Universal	-
>>Coding Scheme Designator	0008,0102	SH		X			X	Universal	-
>>Coding Scheme Version	0008,0103	SH		X			X	Universal	-
Requested Procedure Module									
Requested Procedure Description	0032,1060	LO		X		X	X	Universal	-
Requested Procedure ID	0040,1001	SH		X	X	X	X	Single Value	-
Study Instance UID	0020,000D	UI		X			X	Universal	-
Referenced Study Sequence	0008,1110	SQ		X			X		-
>Referenced SOP Class UID	0008,1150	UI		X			X	Universal	-
>Referenced SOP Instance UID	0008,1155	UI		X			X	Universal	-
Requested Procedure Code Sequence	0032,1064	SQ		X					-
>Code Meaning	0008,0104	LO		X				Universal	-
>Code Value	0008,0100	SH		X				Universal	-
>Coding Scheme Designator	0008,0102	SH		X				Universal	-
>Coding Scheme Version	0008,0103	SH		X				Universal	-
Imaging Service Request Module									
Accession Number	0008,0050	SH		X	X	X	X	Single Value	-
Referring Physician's Name	0008,0090	PN		X		X	X	Universal	-

The default Query Configuration is set to Modality (OT) and Date (Today). Optionally, additional matching for the own AET and/or own Station Name is configurable.

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

Table 17: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete - No final identifier is supplied	The association is released and the matches are stored.
Failure	A700	Refused - Out of resources	Processing of the matches and the association is terminated. A message appears in the GUI.
	A900	Failed - Identifier does not match SOP class	The association is terminated and the status is logged into the system error log. A message appears in the GUI.
	Cxxx	Failed - Unable to process	Processing of the matches and the association is terminated. A message appears in the GUI.
Pending	FF00	Matches are continuing - Current match is supplied and any optional keys were supported in the same manner as required keys	Processing of the matches continues.
	FF01	Matches are continuing - Warning that one or more optional keys were not supported for existence for this identifier	Processing of the matches continues without any warnings or errors.

4.2.1.3.3. (Real-World) Activity – Modality Performed Procedure Step as SCU

4.2.1.3.3.1. Description and Sequencing of Activities

After an acquisition the Mobile C-Arm AE sent related Modality Performed Procedure Step (MPPS) data to a Study Management SCP (RIS/HIS). Then the acquired image is stored or printed according the settings as specified by the operator.

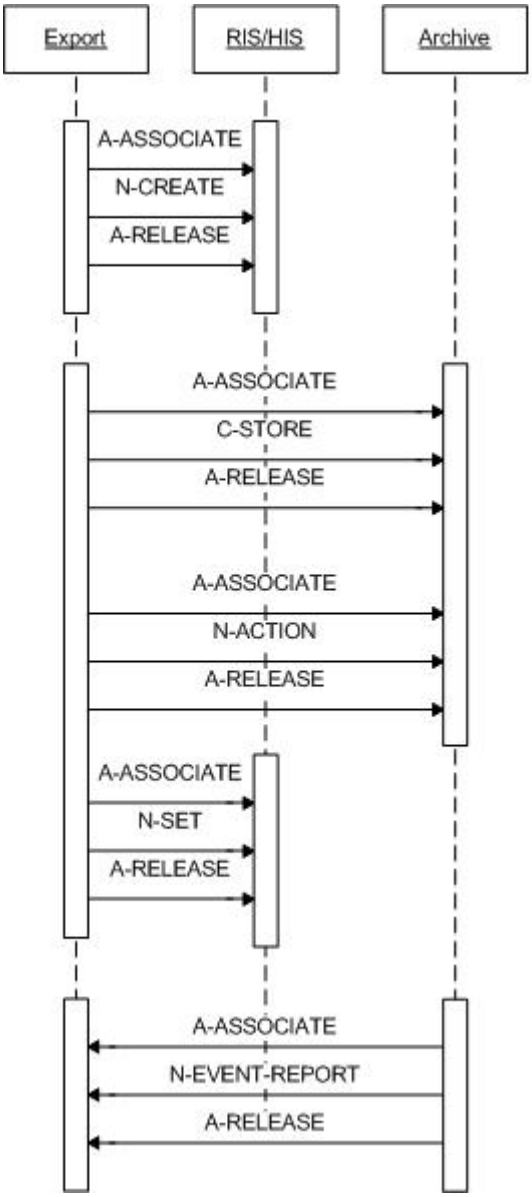

Figure 12: RWA - Modality Performed Procedure Step

The Modality Performed Procedure Step for a specific exam happens in two steps.

An examination is selected from Scheduled work list (or added new examination within the system).
Examination is started.
Acquisition is started. At this moment MPPS N-CREATE with status “IN PROGRESS” will be sent to RIS when first image is acquired within an examination.

When operator selects the acquired images and exports them to the DICOM network node that is configured to trigger MPPS, then after the images are exported, MPPS N-SET will be sent to RIS with status either COMPLETED or DISCONTINUED.

When additional images are selected and exported, then new instance of MPPS N-CREATE and N-SET will be created and sent to RIS. If at system configuration "Append MPPS for additional exported images" is no, then no new MPPS messages are sent to RIS.

4.2.1.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 18: Proposed Presentation Contexts for (Real-World) Activity – Modality Performed Procedure Step as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.1.3.3.3. SOP Specific Conformance for Modality Performed Procedure Step SOP Class

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

The Mobile C-Arm AE provides standard conformance to the Modality Performed Procedure Step SOP class.

4.2.1.3.3.3.1. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-CREATE-SCU

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

Table 19: MPPS Request Identifiers for N-CREATE-RQ

Attribute Name	Tag	VR	Value	Comment
SOP Common Module				
Specific Character Set	0008,0005	CS	ISO_IR 100	Required if expanded/replacement character set used.
Performed Procedure Step Relationship Module				
Patient ID	0010,0020	LO		From WLM or entered by user.
Patient's Birth Date	0010,0030	DA		From WLM or entered by user.
Patient's Name	0010,0010	PN		From WLM or entered by user.
Patient's Sex	0010,0040	CS	F, M, O	From WLM or entered by user.
Referenced Patient Sequence	0008,1120	SQ		EMPTY or from WLM
>Referenced SOP Class UID	0008,1150	UI		From WLM
>Referenced SOP Instance UID	0008,1155	UI		From WLM
Scheduled Step Attributes Sequence	0040,0270	SQ		-
>Accession Number	0008,0050	SH		From WLM or entered by User.
>Requested Procedure Description	0032,1060	LO		EMPTY or from WLM.
>Requested Procedure ID	0040,1001	SH		EMPTY or from WLM.
>Scheduled Procedure Step Description	0040,0007	LO		EMPTY or from WLM.
>Scheduled Procedure Step ID	0040,0009	SH		EMPTY or from WLM.
>Study Instance UID	0020,000D	UI		Newly generated or from WLM/

Attribute Name	Tag	VR	Value	Comment
>Referenced Study Sequence	0008,1110	SQ		EMPTY or from WLM.
>>Referenced SOP Class UID	0008,1150	UI		From WLM.
>>Referenced SOP Instance UID	0008,1155	UI		From WLM.
>Scheduled Protocol Code Sequence	0040,0008	SQ		EMPTY or from WLM
>>Code Meaning	0008,0104	LO		From WLM.
>>Code Value	0008,0100	SH		From WLM.
>>Coding Scheme Designator	0008,0102	SH		From WLM.
>>Coding Scheme Version	0008,0103	SH		From WLM.
Performed Procedure Step Information Module				
Performed Location	0040,0243	SH		EMPTY
Performed Procedure Step Description	0040,0254	LO		Copied from Requested Procedure Description (0032,1060) or Scheduled Procedure Step description (0040,0007) of MWL. If MWL is empty, then Examination Type is used.
Performed Procedure Step End Date	0040,0250	DA		EMPTY
Performed Procedure Step End Time	0040,0251	TM		EMPTY
Performed Procedure Step ID	0040,0253	SH		Running counter.
Performed Procedure Step Start Date	0040,0244	DA		Exam date, format: <yyyymmdd.>
Performed Procedure Step Start Time	0040,0245	TM		Exam time, format: <hhmmss.>
Performed Procedure Step Status	0040,0252	CS	IN PROGRESS	-
Performed Procedure Type Description	0040,0255	LO		EMPTY
Performed Station AE Title	0040,0241	AE		System AE Title.
Performed Station Name	0040,0242	SH		-
Procedure Code Sequence	0008,1032	SQ		EMPTY or from WLM ->Requested Procedure Code Sequence
>Code Meaning	0008,0104	LO		From WLM.
>Code Value	0008,0100	SH		From WLM.
>Coding Scheme Designator	0008,0102	SH		From WLM.
>Coding Scheme Version	0008,0103	SH		From WLM.
Image Acquisition Results Module				
Modality	0008,0060	CS	XA	From WLM.
Study ID	0020,0010	SH		EMPTY or From WLM->Requested Procedure ID
Performed Protocol Code Sequence	0040,0260	SQ		EMPTY
Performed Series Sequence	0040,0340	SQ		EMPTY
Radiation Dose Module				
Entrance Dose	0040,0302	US		attribute is sent with an appropriate value
Entrance Dose in mGy	0040,8302	DS		attribute is sent with an appropriate value
Image and Fluoroscopy Area Dose Product	0018,115E	DS		attribute is sent with an appropriate value
Total Number of Exposures	0040,0301	US		attribute is sent with an appropriate value
Total Time of Fluoroscopy	0040,0300	US		attribute is sent with an appropriate value

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

Table 20: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the MPPS service request successfully.
Failure	0105	No such attribute	The association is aborted and the MPPS service request is marked as failed in the export queue.
Failure	0110	Processing failure - Performed procedure step object may no longer be updated	The association is aborted and the MPPS service request is marked as failed in the export queue.
Warning	0107	Attribute list error	The MPPS service request is considered successful.
Warning	0116	Attribute value out of range	The MPPS service request is considered successful.

4.2.1.3.3.2. Dataset Specific Conformance for Modality Performed Procedure Step SOP Class N-SET-SCU

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

Table 21: MPPS Request Identifiers for N-SET-RQ

Attribute Name	Tag	VR	Value	Comment
Performed Procedure Step Information Module				
Performed Procedure Step Description	0040,0254	LO		EMPTY
Performed Procedure Step End Date	0040,0250	DA		<yyyymmdd>
Performed Procedure Step End Time	0040,0251	TM		<hhmmss>
Performed Procedure Step Status	0040,0252	CS	COMPLETED, DISCONTINUED	-
Performed Procedure Type Description	0040,0255	LO		EMPTY
Performed Procedure Step Discontinuation Reason Code Sequence	0040,0281	SQ		Present if Performed Procedure Step Status is DISCONTINUED
>Code Meaning	0008,0104	LO		-
>Code Value	0008,0100	SH		-
>Coding Scheme Designator	0008,0102	SH		-
>Coding Scheme Version	0008,0103	SH		-
Image Acquisition Results Module				
Performed Series Sequence	0040,0340	SQ		-
>Operators' Name	0008,1070	PN		Performing Technologist.
>Performing Physician's Name	0008,1050	PN		EMPTY or copied from Scheduled Performing Physician's name if provided by MWL, or can entered by operator.
>Protocol Name	0018,1030	LO		User selectable in MPPS panel.
>Retrieve AE Title	0008,0054	AE		EMPTY
>Series Description	0008,103E	LO		EMPTY
>Series Instance UID	0020,000E	UI		Reference to series.
>Referenced Image Sequence	0008,1140	SQ		Reference to all sent images.
>>Referenced SOP Class UID	0008,1150	UI		1.2.840.10008.5.1.4.1.1.12.1
>>Referenced SOP Instance UID	0008,1155	UI		-
>Referenced Non-Image Composite SOP Instance Sequence	0040,0220	SQ		EMPTY

Attribute Name	Tag	VR	Value	Comment
Radiation Dose Module				
Entrance Dose	0040,0302	US		attribute is sent with an appropriate value
Entrance Dose in mGy	0040,8302	DS		attribute is sent with an appropriate value
Image and Fluoroscopy Area Dose Product	0018,115E	DS		attribute is sent with an appropriate value
Total Number of Exposures	0040,0301	US		attribute is sent with an appropriate value
Total Time of Fluoroscopy	0040,0300	US		attribute is sent with an appropriate value

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

Table 22: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the MPPS service request successfully.
Failure	0105	No such attribute	The association is aborted and the MPPS service request is marked as failed in the export queue.
Failure	0110	Processing failure - Performed procedure step object may no longer be updated	The association is aborted and the MPPS service request is marked as failed in the export queue.
Warning	0107	Attribute list error	The MPPS service request is considered successful.
Warning	0116	Attribute value out of range	The MPPS service request is considered successful.

4.2.1.3.4. (Real-World) Activity – Image Export

4.2.1.3.4.1. Description and Sequencing of Activities

The acquired image is stored as per the settings specified by the operator.

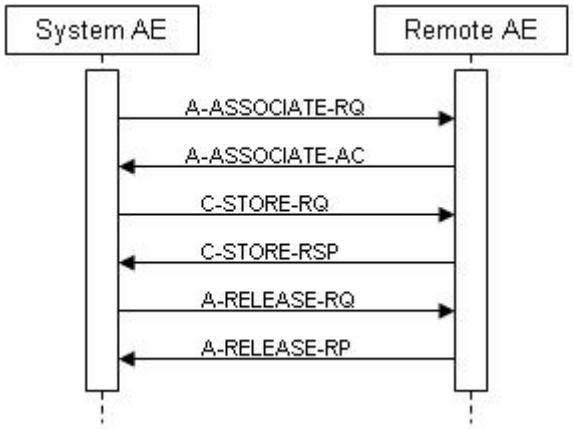

Figure 13: RWA Export (C-STORE)

4.2.1.3.4.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 23: 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		
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	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.1.3.4.3. SOP Specific Conformance for Storage SOP Classes

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

The Mobile C-Arm AE provides standard conformance to the Storage SOP classes.

The Mobile C-Arm administration is based on Examinations, where each Examination is mapped to one Study (for one Patient). An Examination consists of one or more Runs, where each Run is mapped to one Series.

Note that a Secondary Capture Series can contain one or more Secondary Capture Images, though an XA Series can contain only one multi-frame XA Image of one or more Frames.

Upon receiving a C-STORE response with status Error or Refused, the Mobile C-Arm AE will release the association. The transfer of all of the selected images of the examination will be considered failed. The operator may retry export jobs manually.

4.2.1.3.4.3.1. Dataset Specific Conformance for C-STORE-RQ

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

Table 24: Status Response

ServiceStatus	ErrorCode	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the Storage service request successfully.
Failure	A7xx	Refused - Out of Resources	Image transfer is considered failed. Images remain in queue. User can initiate retry. Status is logged in system file.
	A9xx	Error - Data Set does not match SOP Class	Image transfer is considered failed. Images remain in queue. User can initiate retry. Status is logged in system file.
	C000	Error - Cannot understand	Image transfer is considered failed. Images remain in queue. User can initiate retry. Status is logged in system file.
Warning	B000	Coercion of Data Elements	Image transfer is considered successful. Status is logged in system file.
	B007	Data Set does not match SOP Class	Image transfer is considered successful. Status is logged in system file.
	B006	Elements Discarded	Image transfer is considered successful. Status is logged in system file.

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

If the configured storage DICOM node is Archive, then Storage Commitment is initiated by Mobile C-Arm. Mobile C-Arm supports asynchronous storage commitment.

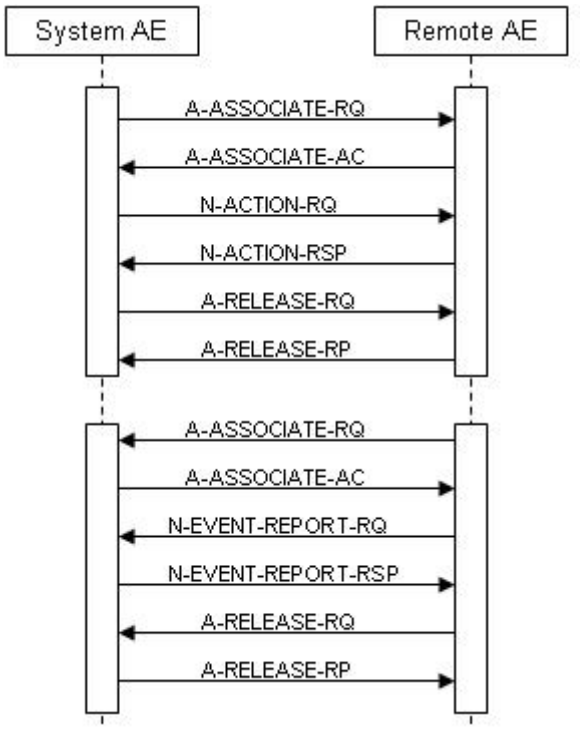

Figure 14: RWA Storage Commitment

4.2.1.3.5.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 25: 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 Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

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

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

The Mobile C-Arm AE provides standard conformance to the Storage Commitment Push Model SOP class for Asynchronous Storage Commitment.

4.2.1.3.5.3.1. Dataset Specific Conformance for Storage Commitment Push Model N-ACTION SCU

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

Table 26: Storage Commitment Attribute for N-ACTION-RQ

Attribute Name	Tag	Comment
Storage Commitment Module		
Transaction UID	0008,1195	Generated Unique ID for each transaction
Referenced SOP Sequence	0008,1199	References to all images sent
>Referenced SOP Class UID	0008,1150	References to send SOP Class.
>Referenced SOP Instance UID	0008,1155	References to all images sent

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

Table 27: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Success	The SCP has completed the Storage Commitment service request successfully.
Abort	xxxx	Any other status code	The association is aborted and the storage commitment is marked as failed.

4.2.1.3.5.3.2. Dataset Specific Conformance for Storage Commitment Push Model N-EVENT-REPORT 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 28: Storage Commitment - N-EVENT-REPORT Behavior

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are marked within the database as "Stored & Committed (SC)" to the value of Retrieve AE Title (0008,0054).
Storage Commitment Request Complete - Failures Exist	2	In case of a "Failure Exist" situation (Referenced SOP Instances under Failed SOP Sequence (0008,1198)), all of the stored SOP Instances for that examination are considered as failed for storage commitment. A sent job that failed storage commitment will not be automatically restarted but can be resumed by the user.

Table 29: Storage Commitment N-EVENT-REPORT Failure Handling Behavior

ServiceStatus	ErrorCode	Further Meaning	Description
Success	0000	Success	The Mobile C-Arm AE has completed the operation successfully.
Failure	*	Any other failure status code	The association is aborted and the storage commit NEVENT-REPORT is marked as failed

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

4.2.1.3.6.1. Description and Sequencing of Activities

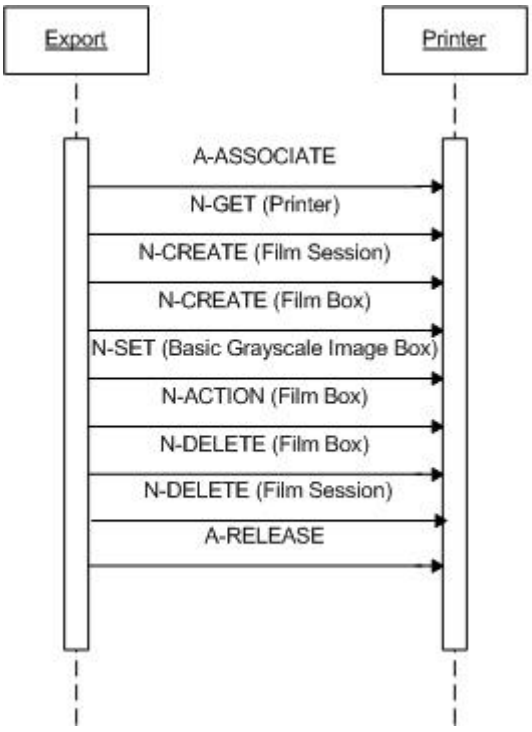

Figure 15: RWA - Print

Based on the selected layout, the Mobile C-Arm AE will create a Film Session containing a single Film Box. The content of the Image Box will be filled for the print request (Film Box level). Once the print session has completed the Film Session will be deleted. A new Film Box is created for each successive film within the Film Session.

The Mobile C-Arm AE is implemented to acquire grayscale images and thus to negotiate for Basic Grayscale Print Management. The processing of a print job can be cancelled at any time; then the Mobile C-Arm AE will abort the processing immediately.

Before a queued print job is actually started, the system will retrieve the printer status. Upon receiving a normalized service response (N-GET) containing a Failure or Warning status, the Mobile C-Arm AE does not start the export job.

Upon receiving a print command response with failure status, the Mobile C-Arm AE will release the association. The transfer of all of the selected images of the examination will be considered failed. The operator may retry export jobs manually.

4.2.1.3.6.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 30: 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 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 Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

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

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

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 Film Box SOP Class of the Basic Grayscale Print Management Meta SOP Class

This section and sub-section includes 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 Film Box N-ACTION SCU

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

Table 31: Status Response.

ServiceStatus	ErrorCode	Further Meaning	Description
Success	0000	Successful operation.	The print job continues.

ServiceStatus	ErrorCode	Further Meaning	Description
Failed	C602	Unable to create print job SOP instance – print queue is full.	The print job is marked as failed, the reason is reported and logged.
	C603	Image size is larger than image box size.	The print job is marked as failed, the reason is reported and logged.
	C613	Combined print image size is larger than image box size.	The print job is marked as failed, the reason is reported and logged.
Warning	B603	Film Box SOP instance hierarchy does not contain Image Box SOP instances.	The print job continues and the warning is reported and logged.
	B604	Image size is larger than image box size – the image has been de-magnified.	The print job continues and the warning is reported and logged.
	B609	Image size is larger than image box size – the image has been cropped to fit	The print job continues and the warning is reported and logged.
	B60A	Image size or combined print image size is larger than image box size – the image or combined print image has been decimated to fit.	The print job continues and the warning is reported and logged.

4.2.1.3.6.3.2. Dataset Specific Conformance for Basic Film Box N-CREATE SCU

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

Table 32: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Border Density	2010,0100	CS	OD (i), BLACK, WHITE	ALWAYS	CONFIG	(i), integer range: 0..1000
Configuration Information	2010,0150	ST		ALWAYS	AUTO	-
Empty Image Density	2010,0110	CS	BLACK, WHITE	ALWAYS	AUTO	-
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	ALWAYS	CONFIG	-
Film Size ID	2010,0050	CS	11INX11IN, CURRENT, 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, A3, A4, 24CMX30CM, 8_5INX11IN, 8INX10IN,	ALWAYS	CONFIG	-
Image Display Format	2010,0010	ST	STANDARD\1,1, STANDARD\2,2, STANDARD\2,3, STANDARD\1,2, STANDARD\3,4.	ALWAYS	CONFIG	-
Magnification Type	2010,0060	CS	BILINEAR, CUBIC, NONE, REPLICATE	ALWAYS	AUTO	-
Max Density	2010,0130	US	0..1000	ALWAYS	AUTO	-
Min Density	2010,0120	US	0..1000	ALWAYS	AUTO	-
Smoothing Type	2010,0080	CS	1, 10, 11, 12, 13, 14, 15, 140, 2, 3, 4, 5, 6, 7, 8, 9, ENHANCED, SHARP, ENHANCED1, MEDIUM, NORMAL, SMOOTH	ALWAYS	AUTO	-
Trim	2010,0140	CS	NO, YES	ALWAYS	AUTO	-

Table 33: 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	1.2.840.10008.5.1.1.1	ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

Note: The default values and ranges are printer type dependent.

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

Table 34: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created	Normal completion
Warning	B6XX		Print Film Session considered successful. Status logged in system file.
Failure	C6XX		Print Film Session considered failed. Status logged in system file.

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

This section and sub-section includes 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 Session 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 35: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film accepted for printing	Normal completion
Warning	B6XX		Print Film Session considered successful. Status logged in system file.
Failure	C6XX		Print Film Session considered failed. Status logged in system file.

4.2.1.3.6.4.2. Dataset Specific Conformance for Basic Film Session N-CREATE SCU

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

Table 36: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Film Destination	2000,0040	CS	BIN_i, PROCESSOR, CURRENT, MAGAZINE	ALWAYS	CONFIG	(i=Integer)
Film Session Label	2000,0050	LO		ALWAYS	AUTO	Equal to Exam Type
Medium Type	2000,0030	CS	BLUE FILM, PAPER, TRANSPARENCY, CLEAR FILM, CURRENT	ALWAYS	CONFIG	-
Number of Copies	2000,0010	IS		ALWAYS	CONFIG	Integer (1-99)

Print Priority	2000,0020	CS	HIGH, LOW, MED	ALWAYS	CONFIG	-

Note: The default values are printer type dependent.

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

Table 37: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Session successfully created	Normal completion
Warning	B6XX		Print Film Session considered successful. Status logged in system file.
Failure	C6XX		Print Film Session considered failed. Status logged in system file.

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

This section and sub-section includes 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 Grayscale Image Box N-SET SCU

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

Table 38: Image Box Pixel Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Box Position	2020,0010	US		ALWAYS	AUTO	Generated
Polarity	2020,0020	CS	NORMAL, REVERSE	ALWAYS	AUTO	-
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	-
>Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	-
>Bits Stored	0028,0101	US	12	ALWAYS	FIXED	-
>Columns	0028,0011	US	1280	ALWAYS	FIXED	-
>High Bit	0028,0102	US	11	ALWAYS	FIXED	-
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	-
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	-
>Pixel Representation	0028,0103	US	0x0000	ALWAYS	FIXED	-
>Rows	0028,0010	US	1024	ALWAYS	FIXED	-
>Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	-

Note: The default values are printer type dependent.

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

Table 39: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Image successfully stored in Image Box	Normal completion
Warning	B6XX		Print Film Session considered successful. Status logged in system file.
Failure	C6XX		Print Film Session considered failed. Status logged in system file.

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

This section and sub-section includes 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 N-GET SCU

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

Table 40: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Printer Status	2110,0010	CS		ALWAYS	AUTO	Provided by printer
Printer Status Info	2110,0020	CS		ALWAYS	AUTO	Provided by printer

Note: Only in case that the printer responds with a Printer status of "NORMAL" or "WARNING" the Mobile C-Arm AE continues printing of the images.

4.2.1.3.6.6.2. Dataset Specific Conformance for Printer N-EVENT-REPORT 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 41: Printer - N-EVENT-REPORT Behavior

Event Type Name	Event Type ID	Behavior
NORMAL	1	When evaluated, the Mobile C-Arm AE sent response. The event is logged. The print job continues.
WARNING	2	When evaluated, the Mobile C-Arm AE sent response. The event is logged. The print job continues.
FAILURE	3	When evaluated, the Mobile C-Arm AE sent response. The event is logged. The print job gets aborted and is marked as failed.

4.2.1.4. Association Acceptance Policy

Not applicable.

4.2.2. ViewForum Surgical Workstation AE

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

4.2.2.1. SOP Classes

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

Table 42: SOP Classes for ViewForum Surgical Workstation AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	No	Yes
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	No	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	No	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	No	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	No	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	No	Yes
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Patient Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.1.2	Yes	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
Study Root QR Information Model - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
Patient/Study Only QR Info. Model - FIND SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.1	Yes	No
Patient/Study Only QR Info. Model - MOVE SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.2	Yes	No
Specialized PMS X-Ray Image Store (Private)	1.3.46.670589.2.3.1.1	No	Yes
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	No	Yes
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	No	Yes
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	No	Yes
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	No	Yes
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	No	Yes
Perfusion (Private)	1.3.46.670589.5.0.13	No	Yes
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	No	Yes
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	No	Yes
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	No	Yes
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	No	Yes
CT Synthetic Image Storage (Private)	1.3.46.670589.5.0.9	No	Yes

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

4.2.2.2. Association Policies

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

4.2.2.2.1. General

The DICOM standard application context name for DICOM 3.0 is always proposed.

Table 43: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2. Number of Associations

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

The ViewForum Surgical Workstation AE may initiate and accept one association simultaneously.

Table 44: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

Table 45: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous associations	configurable

4.2.2.2.3. Asynchronous Nature

The ViewForum Surgical Workstation AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.2.2.4. Implementation Identifying Information

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

Table 46: DICOM Implementation Class and Version for ViewForum Surgical Workstation AE

Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R6.3

4.2.2.2.5. Communication Failure Handling

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

Table 47: Communication Failure Behavior

Exception	Behavior
ARTIM Timeout	The job fails in case of association setup. The reason is logged and reported to the operator.
Reply Timeout	The job fails and the association is aborted. The reason is logged and reported to the operator.
Association Timeout	The association is released.
Association Aborted	The job fails. The reason is logged and reported to the operator.

4.2.2.3. Association Initiation Policy

The Application Entity will response on a received reject Association attempts as shown in next table.

Table 48: Association Rejection response

Result	Source	Reason/Diagnosis	Explanation
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	-
		2 - application-context-name-not supported	-
		3 - calling-AE-title-not-recognized	-
		7 - called-AE-title-not-recognized	-
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	-
		2 - protocol-version-not-supported	-
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	-
		2 - Local-limit-exceeded	-
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	-
		2 - application-context-name-not-supported	-
		3 - calling-AE-title-not-recognized	-
		7 - called-AE-title-not-recognized	-
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	-
		2 - protocol-version-not-supported	-
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary congestion	-
		2 - local-limit-exceeded	-

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

Table 49: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	-
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	-
	1- unrecognized-PDU	-
	2 - unexpected-PDU	-
	4 - unrecognized-PDU parameter	-
	5 - unexpected-PDU parameter	-
	6 - invalid-PDU-parameter value	-

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

4.2.2.3.1.1. Description and Sequencing of Activities

For viewing images, the operator can use the ViewForum Surgical Workstation AE to query a remote archive and select the images to retrieve. The ViewForum Surgical Workstation AE then sent a retrieve request and accepts the related images.

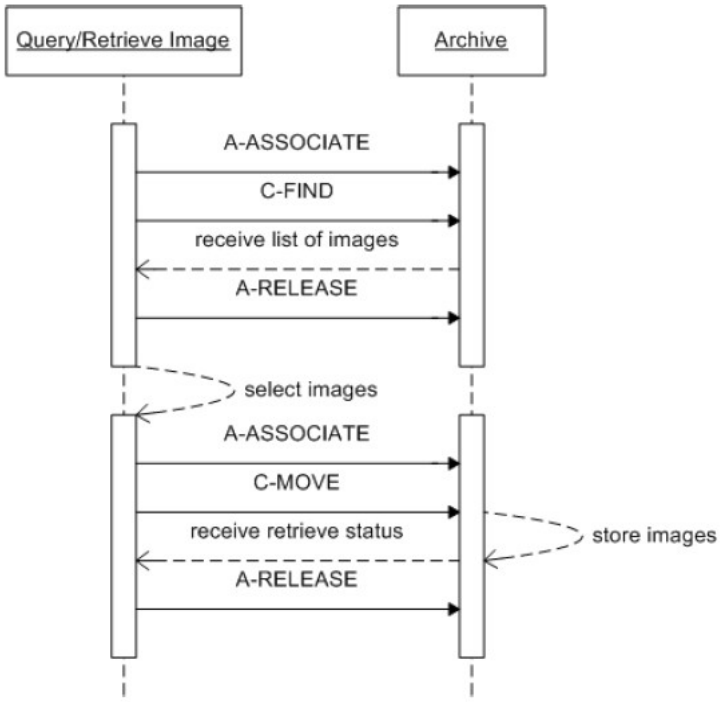

Figure 16: Sequencing of RWA Query/Retrieve Image

The operator queries a remote archive, using the query tool in the data handling facility. The ViewForum Surgical Workstation AE initiates an association to the selected peer entity (Archive) and uses it to sent Query (C-FIND) requests and receives subsequent responses. The association is released when the execution of the query completes and the Query/Retrieve dialog on the GUI is closed. The matching images are then displayed in a patient folder for the remote archive.

The required images can now be selected for copying to the Mobile C-Arm, using the copy tool in the data handling facility. For each copy request the ViewForum Surgical Workstation AE initiates an association to the selected peer entity (Archive) and uses it to sent Retrieve (C-MOVE) requests and receive subsequent responses; an examination may contain both images and presentation states. The association is released after the final Retrieve (C-MOVE) response for the related request has been received (no more pending).

4.2.2.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 50: 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		
Patient/Study Only QR Info. Model - FIND SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.1	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		

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
		Implicit VR Little Endian	1.2.840.10008.1.2		

Note: For performance reasons the ELE transfer syntax is preferred.

4.2.2.3.1.3. SOP Specific Conformance for Patient Root QR Information Model - FIND SOP Class

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

4.2.2.3.1.3.1. Dataset Specific Conformance for Patient Root Q/R Information Model - FIND SOP Class SCU

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

The ViewForum Surgical Workstation AE will not generate queries containing optional keys.
The ViewForum Surgical Workstation AE will not generate relational queries.

In the following table the supported query keys for each query level are described.

Universal matching shall be supported as default.

Table 51: Supported Query Keys for Additional Module

Additional Module				
Attribute Name	Tag	VR	Type Of Matching	Comment
SOP Class UID	0008,0016	UI		Q/R Image Level
Content Date	0008,0023	DA		Q/R Image Level
Content Time	0008,0033	TM		Q/R Image Level
Station Name	0008,1010	SH		Q/R Series Level
Body Part Examined	0018,0015	CS		Q/R Series Level
Performed Procedure Step Start Date	0040,0244	DA		Q/R Series Level
Performed Procedure Step ID	0040,0253	SH		Q/R Series Level

Do note that the query results screen will display all patients that have an empty Patient ID as one patient entry.

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

Table 52: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The find results are displayed.
Failure	A700	Refused - Out of resources	No find results are displayed. The reason is logged.
	A900	Failed - Identifier does not match SOP class	No find results are displayed. The reason is logged.
	Cxxx	Failed - Unable to process	No find results are displayed. The reason is logged.

Service Status	Error Code	Further Meaning	Behavior
Cancel	FE00	Matching terminated due to Cancel Request	No find results are displayed. The reason is logged.
Pending	FF00	Matches are continuing - Current match is supplied and any optional keys were supported in the same manner as required keys	The find command continues.
	FF01	Matches are continuing - Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The find command continues.

4.2.2.3.1.4. SOP Specific Conformance for Patient/Study Only QR Info. Model - FIND SOP Class (Retired)

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

4.2.2.3.1.4.1. Dataset Specific Conformance for Patient/Study Only Q/R Information Model - FIND SOP Class SCU

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

The ViewForum Surgical Workstation AE will not generate queries containing optional keys.
The ViewForum Surgical Workstation AE will not generate relational queries.

In the following table the supported query keys for each query level are described.

Universal matching shall be supported as default.

Do note that the query results screen will display all patients that have an empty Patient ID as one patient entry.

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

Table 53: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The find results are displayed
Failure	A700	Refused - Out of resources	No find results are displayed. The reason is logged.
	A900	Failed - Identifier does not match SOP class	No find results are displayed. The reason is logged.
	Cxxx	Failed - Unable to process	No find results are displayed. The reason is logged.
Cancel	FE00	Matching terminated due to Cancel Request	No find results are displayed. The reason is logged.
Pending	FF00	Matches are continuing - Current match is supplied and any optional keys were supported in the same manner as required keys	The find command continues.
	FE01	Matches are continuing - Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The find command continues.

4.2.2.3.1.5. SOP Specific Conformance for Study Root QR Information Model - FIND SOP Class

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

4.2.2.3.1.5.1. Dataset Specific Conformance for Study Root Q/R Information Model - FIND SOP Class SCU

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

The ViewForum Surgical Workstation AE will not generate queries containing optional keys.
The ViewForum Surgical Workstation AE will not generate relational queries.

In the following table the supported query keys for each query level are described.

Universal matching shall be supported as default.

Table 54: Supported Query Keys for Additional Module

Additional Module				
Attribute Name	**Tag**	**VR**	**Type Of Matching**	**Comment**
SOP Class UID	0008,0016	UI		Q/R Image Level
Content Date	0008,0023	DA		Q/R Image Level
Content Time	0008,0033	TM		Q/R Image Level
Station Name	0008,1010	SH		Q/R Series Level
Body Part Examined	0018,0015	CS		Q/R Series Level
Performed Procedure Step Start Date	0040,0244	DA		Q/R Series Level
Performed Procedure Step ID	0040,0253	SH		Q/R Series Level

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

Table 55: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Matching is complete	The find results are displayed.
Failure	A700	Refused - Out of resources	No find results are displayed. The reason is logged.
	A900	Failed - Identifier does not match SOP class	No find results are displayed. The reason is logged.
	Cxxx	Failed - Unable to process	No find results are displayed. The reason is logged.
Cancel	FE00	Matching terminated due to Cancel Request	No find results are displayed. The reason is logged.
Pending	FF00	Matches are continuing - Current match is supplied and any optional keys were supported in the same manner as required keys	The find command continues.
	FF01	Matches are continuing - Warning that one or more optional keys were not supported for existence and/or matching for this identifier	The find command continues.

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

4.2.2.3.2.1. Description and Sequencing of Activities

Refer to chapter 4.2.3.3.1.1 for the description and sequencing diagram.

4.2.2.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 56: 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		
Patient/Study Only QR Info. Model - MOVE SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.2	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		

Note: For performance reasons the ELE transfer is preferred.

4.2.2.3.2.3. SOP Specific Conformance for Patient Root QR Information Model - MOVE SOP Class

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

4.2.2.3.2.3.1. Dataset Specific Conformance for Patient Root Q/R Information Model - MOVE SOP Class 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 57: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete - No Failures	The move job is marked as completed. The association is released.
Error	A701	Refused - Out of Resources - Unable to calculate number of matches	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Failure	A702	Refused - Out of Resources - Unable to perform Sub-operations	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A801	Refused - Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A900	Failed - Identifier does not match SOP class	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	Cxxx	Failed - Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Cancel	FE00	Sub-operations terminated due to Cancel Indication	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Warning	B000	Sub-operations complete - One or more Failures	The move job is marked as completed. The association is released.
Pending	FF00	Sub-operations are continuing	The move job continues.

4.2.2.3.2.4. SOP Specific Conformance for Patient/Study Only QR Information Model - MOVE SOP Class (Retired)

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

4.2.2.3.2.4.1. Dataset Specific Conformance for Patient/Study Only Q/R Information Model - MOVE SOP Class 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 58: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete - No Failures	The move job is marked as completed. The association is released.
Failure	A701	Refused - Out of Resources - Unable to Calculate number of matches	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A702	Refused - Out of Resources - Unable to perform Sub-operations	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A801	Refused - Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A900	Failed - Identifier does not match SOP class	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	Cxxx	Failed - Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Cancel	FE00	Sub-operations terminated due to Cancel Indication	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Warning	B000	Sub-operations complete - One or more Failures	The move job is marked as completed. The association is released.
Pending	FF00	Sub-operations are continuing	The move job continues.

4.2.2.3.2.5. SOP Specific Conformance for Study Root QR Information Model - MOVE SOP Class

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

4.2.2.3.2.5.1. Dataset Specific Conformance for Study Root Query/Retrieve Information Model - MOVE SOP Class SCU

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

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

Table 59: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Sub-operations complete - No Failures	The move job is marked as completed. The association is released.
Failure	A701	Refused - Out of Resources - Unable to Calculate number of matches	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A702	Refused - Out of Resources - Unable to perform Sub-operations	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	A801	Refused - Move Destination unknown	The move job is marked as failed. The association is released. The reason is logged and reported to the user.

Service Status	Error Code	Further Meaning	Behavior
	A900	Failed - Identifier does not match SOP class	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
	Cxxx	Failed - Unable to process	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Cancel	FE00	Sub-operations terminated due to Cancel Indication	The move job is marked as failed. The association is released. The reason is logged and reported to the user.
Warning	B000	Sub-operations complete - One or more Failures	The move job is marked as completed. The association is released.
Pending	FF00	Sub-operations are continuing	The move job continues.

4.2.2.4. Association Acceptance Policy

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

Table 60: Association Reject Reasons

Result	Source	Reason/Diagnosis	Behavior
1 - rejected permanent	1 - DICOM UL service-user	1 - no-Reason-given	Message.
		2 - application-context-name-not-supported	Message.
		3 - calling-AE-title-not-recognized	Message.
		7 - called-AE-title-not-recognized	Message.
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	Message.
		2 - protocol-version-not-supported	Message.
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	Message.
		2 - local-limit-exceeded	Message.
2 - Rejected-transient	1 - DICOM UL service-user	1 - no-Reason-given	Message.
		2 - application-context-name-not-supported	Message.
		3 - calling-AE-title-not-recognized	Message.
		7 - called-AE-title-not-recognized	Message.
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	Message.
		2 - protocol-version-not-supported	Message.
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	Message.
		2 - local-limit-exceeded	Message.

The behavior of the AE to sent an association abort is summarized in next table

Table 61: Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	Message.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	Message.
	1 - unrecognized-PDU	Message.
	2 - unexpected-PDU	Message.
	4 - unrecognized-PDU parameter	Message.
	5 - unexpected-PDU parameter	Message.
	6 - invalid-PDU-parameter value	Message.

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

4.2.2.4.1.1. Description and Sequencing of Activities

The ViewForum Surgical Workstation AE can send a verification request (C-ECHO) to verify application level communication.

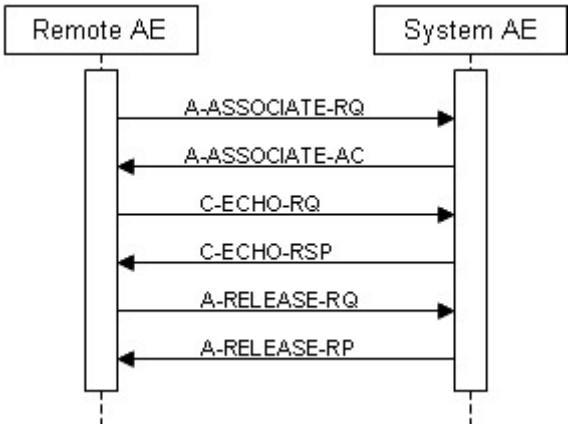

Figure 17: Sequencing of RWA Verification as SCP

4.2.2.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

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

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

4.2.2.4.1.3. SOP Specific Conformance for Verification SOP Class

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

The ViewForum Surgical Workstation AE provides standard conformance to the Verification service class.

4.2.2.4.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCP

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

Table 63: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	Standard verification response.

4.2.2.4.2. (Real-World) Activity – Image Import

4.2.2.4.2.1. Description and Sequencing of Activities

For viewing images, the ViewForum Surgical Workstation AE accepts the retrieved images.

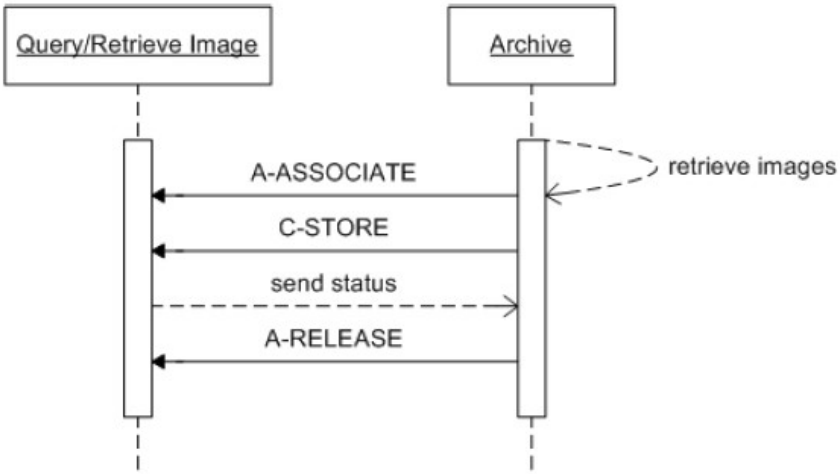

Figure 18: Sequencing of RWA Query/Retrieve Image

For each retrieve request (selected from query results) the ViewForum Surgical Workstation AE accepts an association from the selected peer entity (Archive) and uses it to receive image Storage (C-STORE) requests and sent subsequent responses. On request of the Storage SCU (Archive) the association is released.

4.2.2.4.2.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 64: 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		
3D Object new Storage (Private)	1.3.46.670589.5.0.2.1	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		
3D Volume Storage new SOP Class (Private)	1.3.46.670589.5.0.1.1	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		
Cardio Image Storage new SOP Class (Private)	1.3.46.670589.5.0.8.1	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		
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	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
CT Synthetic Image Storage	1.3.46.670589.5.0.9	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**		
(Private)		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
CX Synthetic Image Storage (Private)	1.3.46.670589.5.0.12	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		
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	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		
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	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		
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	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		
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	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		
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	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		
MR Cardio Analysis new Storage (Private)	1.3.46.670589.5.0.11.1	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		
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		
MR Synthetic Image Storage (Private)	1.3.46.670589.5.0.10	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		
Perfusion (Private)	1.3.46.670589.5.0.13	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		
Perfusion Image Storage (Private)	1.3.46.670589.5.0.14	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		
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
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Surface Storage new (Private)	1.3.46.670589.5.0.3.1	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		
Ultrasound Image Storage SOP	1.2.840.10008.5.1.4.1.1.6.1	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		
Class		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
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		
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	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		
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	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		
XA reconstructed X-ray SOP Class (private)	1.3.46.670589.2.4.1.1	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		

Note: For performance reasons the ELE transfer syntax is preferred and shall be chosen in case multiple transfer syntaxes are proposed in the association negotiation.

The ViewForum Surgical Workstation AE shall accept all contexts in the intersection of the proposed and acceptable presentation contexts. This means that the ViewForum Surgical Workstation AE accepts multiple proposed presentation contexts with the same SOP class but different transfer syntaxes. There is no check for duplicate contexts, and these will therefore be accepted.

4.2.2.4.2.3. SOP Specific Conformance for Storage SOP Classes

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

The ViewForum Surgical Workstation AE provides standard level 1 (Base) conformance to the Storage service class.

If the ViewForum Surgical Workstation AE imports an image and during the association negotiation the presentation state SOP class was not negotiated, then the ViewForum Surgical Workstation AE creates a presentation state instance for the imported image.

The ViewForum Surgical Workstation AE standard supports the photometric interpretations MONOCHROME1, MONOCHROME2, and RGB.

4.2.2.4.2.3.1. 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 65: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Successful stored	The images are stored in the ViewForum Surgical Workstation AE database.
Failure	A7xx	Refused: Out of Resources	The ViewForum Surgical Workstation AE database is full - recovery from this condition is left to the SCU. The ViewForum Surgical Workstation AE sent a notification, log the condition, and abort the association.

Service Status	Error Code	Further Meaning	Behavior
	A9xx	Error: Data Set does not match SOP Class	The SOP class of the image(s) does not match the negotiated abstract syntax. The ViewForum Surgical Workstation AE sent a notification, log the condition, and abort the association.
	C000	Error: cannot understand	The image(s) cannot be parsed. The ViewForum Surgical Workstation AE sent a notification, log the condition, and abort the association.
Warning	B000	Coercion of Data Elements	N/A
	B007	Data Set does not match SOP Class	N/A
	B006	Elements Discarded	N/A

4.2.3. 3D-RX Workstation AE

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

4.2.3.1. SOP Classes

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

Table 66: SOP Classes for 3D-RX Workstation AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	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.

4.2.3.2. Association Policies

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

4.2.3.2.1. General

The DICOM standard application context name for DICOM 3.0 is always proposed.

Table 67: DICOM Application Context

Description	Value
Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2. Number of Associations

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

The 3D-RX Workstation AE may initiate one association simultaneously.

Table 68: Number of associations as an Association Initiator for this AE

Description	Value
Maximum number of simultaneous associations	1

Table 69: Number of associations as an Association Acceptor for this AE

Description	Value
Maximum number of simultaneous associations	0

4.2.3.2.3. Asynchronous Nature

The 3D-RX Workstation AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.2.3.2.4. Implementation Identifying Information

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

Table 70: DICOM Implementation Class and Version for 3D-RX Workstation AE

Implementation Class UID	1.3.46.670589.7.8.7.2
Implementation Version Name	XV_rel_7.2

4.2.3.2.5. Communication Failure Handling

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

Table 71: Communication Failure Behavior

Exception	Behavior
Unreachable host	Message "Storage error: Check storage device"
Connection lost in middle of transfer	Message "Storage error: Check storage device"
Network Timeouts	Message "Communication cannot be established. Call service"

4.2.3.3. Association Initiation Policy

The Application Entity will response on a received reject Association attempts as shown in next table.

Table 72: Association Rejection response

Result	Source	Reason/Diagnosis	Behavior
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	Message
		2 - application-context-name-not supported	Message.
		3 - calling-AE-title-not-recognized	Message
		7 - called-AE-title-not-recognized	Message
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	Message
		2 - protocol-version-not-supported	Message
	3 - DICOM UL service-provider(Presentation related function)	1 - temporary-congestion	Message
		2 - Local-limit-exceeded	Message
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	Messag.
		2 - application-context-name-not-supported	Message.
		3 - calling-AE-title-not-recognized	Message
		7 - called-AE-title-not-recognized	Message
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	Message
		2 - protocol-version-not-supported	Message
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary congestion	Message
		2 - local-limit-exceeded	Message

The message is in all cases: "Communication cannot be established. Call service".

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

Table 73: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	Message.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	Message.
	1- unrecognized-PDU	Message.
	2 - unexpected-PDU	Message.
	4 - unrecognized-PDU parameter	Message.
	5 - unexpected-PDU parameter	Message.
	6 - invalid-PDU-parameter value	Message.

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

4.2.3.3.1.1. Description and Sequencing of Activities

The operator is able to select one or more images from the internal database (via the Data Handling facility) and perform the Print operation on them.

The operator will select the print destination (out of choice list of configured printers) and some print parameters. As a result, the 3D-RX Workstation AE will initiate an association to the selected printer and uses it to send the Print Service Elements of the Print SOP Classes.

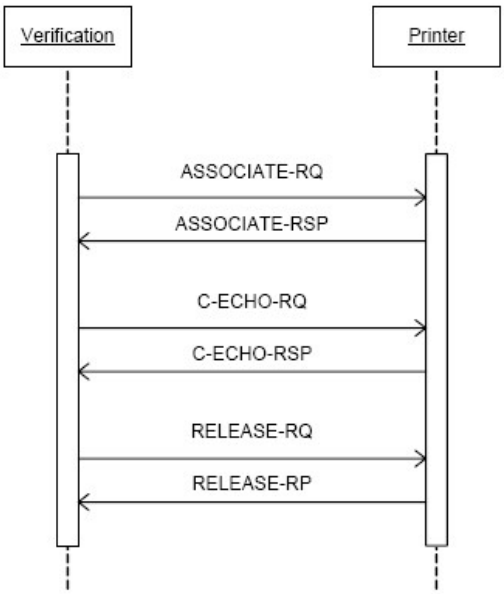

Figure 19: (Real World) Activity - 3D-RX Workstation AE as SCU

4.2.3.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 74: 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		

4.2.3.3.1.3. SOP Specific Conformance for Verification SOP Class

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

4.2.3.3.1.3.1. 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 75: DICOM Command Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using AP-ABORT and command marked as failed. The standard error message is displayed.
Association aborted	The command is marked as failed. The standard error message is displayed.

4.2.3.3.2. (Real-World) Activity – Image Export

4.2.3.3.2.1. Description and Sequencing of Activities

After selection of an image file, the file will be sent when initiating the Sent command. The 3D-RX Workstation AE initiates one association to the preconfigured peer system and uses it to send the selected images and runs via CSTORE requests (and receives the associated C-STORE responses). The association is released after successful transfer of the images or when an error occurs.

The 3D-RX Workstation AE handles each sent request one after another.

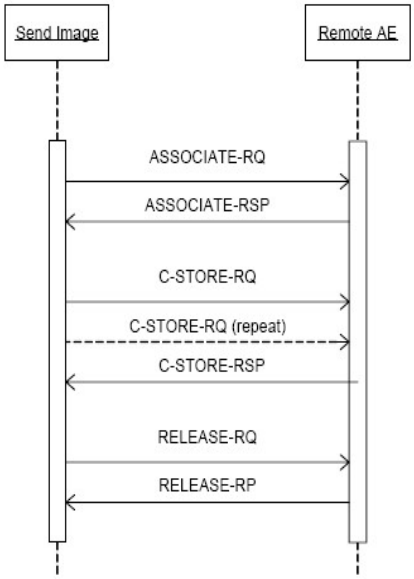

Figure 20: Real world activity Send Image

4.2.3.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 76: 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		
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	SCU	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	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		

4.2.3.3.2.3. SOP Specific Conformance for Storage SOP Classes

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

4.2.3.3.2.3.1. Dataset Specific Conformance for C-STORE-RQ

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

Table 77: Status Response

ServiceStatus	ErrorCode	Further Meaning	Behavior
Success	0000	Successful stored	Message in console
Failure	A7xx	Refused: Out of Resources	Message in console
	A9xx	Error: Data Set does not match SOP Class	Message in console

ServiceStatus	ErrorCode	Further Meaning	Behavior
	Cxxx	Error: cannot understand	Message in console
Warning	B000	Coercion of Data Elements	Message in console
	B007	Data Set does not match SOP Class	Message in console
	B006	Elements Discarded	Message in console

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

4.2.3.3.3.1. Description and Sequencing of Activities

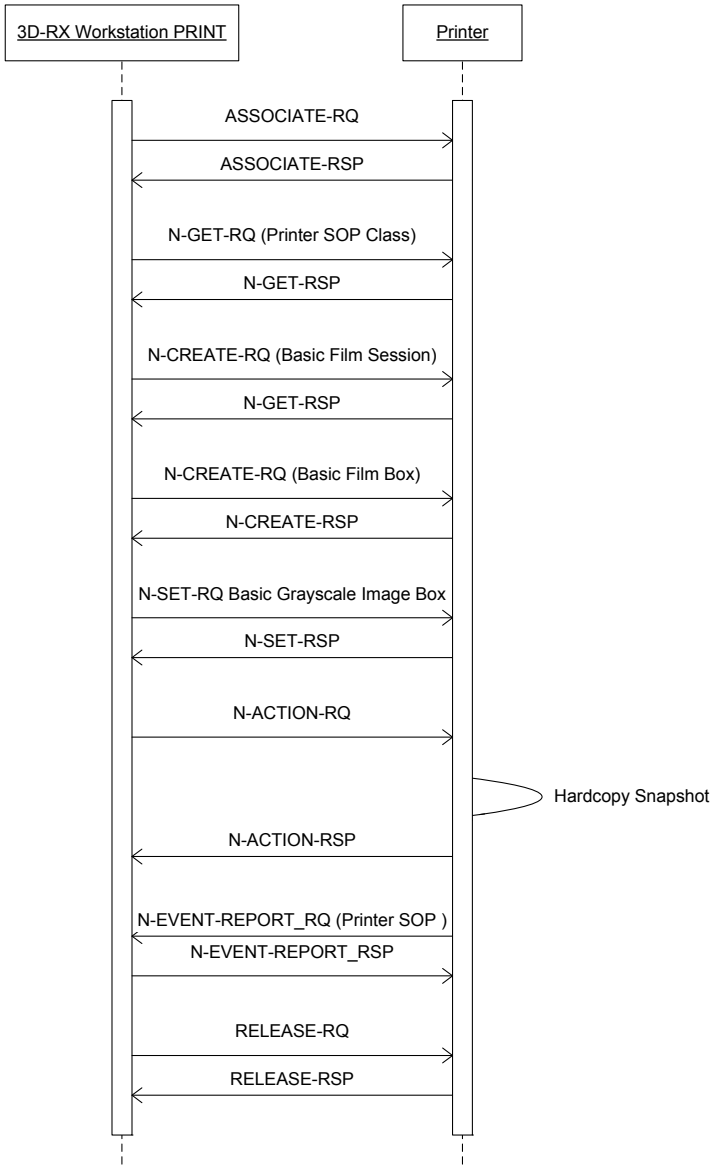

Figure 21: (Real World) Activity - Print Management as SCU

4.2.3.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 78: 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 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 each private IOD).

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

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

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

4.2.3.3.3.3.1. Dataset Specific Conformance for Basic Film Box 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 79: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created.	
Warning	<>0000	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Continue Job + UI Message
Error	<>0000	There is an existing Film Box that has not been printed and NACTION at the Film Session level is not supported. A new Film Box will not be created when a previous Film Box has not been printed.	Stop Job + UI Message

4.2.3.3.3.3.2. Dataset Specific Conformance for Basic Film Box N-CREATE SCU

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

Table 80: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Border Density	2010,0100	CS	BLACK	ALWAYS	FIXED	-
Configuration Information	2010,0150	ST		ALWAYS	CONFIG	Printer dependent
Empty Image Density	2010,0110	CS	BLACK	ALWAYS	FIXED	-
Film Orientation	2010,0040	CS		ALWAYS	AUTO	-
Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX14IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8INX10IN	ALWAYS	CONFIG	-
Image Display Format	2010,0010	ST	STANDARD\1,1, STANDARD\2,2, STANDARD\2,3, STANDARD\1,2, STANDARD\3,4.	ALWAYS	USER	-
Magnification Type	2010,0060	CS	BILINEAR, CUBIC, NONE, REPLICATE	ALWAYS	CONFIG	-
Max Density	2010,0130	US		ALWAYS	CONFIG	1-350
Min Density	2010,0120	US		ALWAYS	AUTO	0-349 (printer dependent)
Smoothing Type	2010,0080	CS		ALWAYS	CONFIG	-
Trim	2010,0140	CS	NO	ALWAYS	FIXED	-

Table 81: Basic Film Box Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Film Session Sequence	2010,0500	SQ		ALWAYS	AUTO	Parent Film Session
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.5.1.1.1	ALWAYS	FIXED	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

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

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

4.2.3.3.3.4.1. Dataset Specific Conformance for Basic Film Session N-CREATE SCU

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

Table 82: Basic Film Session Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Film Destination	2000,0040	CS	PROCESSOR, BIN_1, MAGAZINE	ALWAYS	CONFIG	-
Medium Type	2000,0030	CS	BLUE FILM, PAPER, CLEAR FILM, CURRENT	ALWAYS	CONFIG	-
Number of Copies	2000,0010	IS		ALWAYS	USER	-
Print Priority	2000,0020	CS	HIGH, LOW, MED	ALWAYS	CONFIG	-

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

Table 83: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film belongs to the film session are accepted for printing; if supported, the Print Job SOP Instance is created.	Continue Job
Error	<>0000	Film Session SOP Instance hierarchy does not contain Film Box SOP Instances. OR Unable to create Print Job SOP Instance; print queue is full. OR Image size is larger than image box size. OR Combined Print Image size is larger than the Image Box size.	Stop Job + UI Message
Warning	<>0000	Film session printing (collation) is not supported. OR Film Session SOP Instance hierarchy does not contain Image Box SOP Instances (empty page). OR Image size is larger than image box size, the image has been De-magnified. OR Image size is larger than the Image Box size. The Image has been cropped to fit. OR Image size or Combined Print Image size is larger than the Image Box size. Image or Combined Print Image has been decimated to fit.	Continue Job + UI Message

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

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

4.2.3.3.3.5.1. Dataset Specific Conformance for Basic Grayscale Image Box N-SET SCU

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

Table 84: 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	NORMAL	ALWAYS	FIXED	-
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	-

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

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

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

4.2.3.3.3.6.1. Dataset Specific Conformance for Printer N-GET SCU

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

Table 85: Printer Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Printer Status	2110,0010	CS		ANAPCV	AUTO	-

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

Table 86: N-GET-RQ Response Contents

Attribute Name	Tag	VR	Comment
Printer Status	2110,0010	CS	Retrieves the printer statuses OK or WARNING or ERROR. 3D-RX Workstation takes the following actions for these responses.
			OK - 3D-RX Workstation starts the print session
			WARNING - Shows warning message in UI and starts print session
			ERROR- Gets the printer status info (2110,0020), logs the information for service engineer , Closes the communication with the printer and exits.

4.2.3.3.3.6.2. Dataset Specific Conformance for Printer N-EVENT-REPORT SCU

4.2.3.4. Association Acceptance Policy

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

Table 87: Association Reject Reasons

Result	Source	Reason/Diagnosis	Explanation
1 - rejected permanent	1 - DICOM UL service-user	1 - no-Reason-given	-
		2 - application-context-name-not-supported	-
		3 - calling-AE-title-not-recognized	-

Result	Source	Reason/Diagnosis	Explanation
		7 - called-AE-title-not-recognized	-
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	-
		2 - protocol-version-not-supported	-
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	-
		2 - local-limit-exceeded	-
2 - Rejected-transient	1 - DICOM UL service-user	1 - no-Reason-given	-
		2 - application-context-name-not-supported	-
		3 - calling-AE-title-not-recognized	-
		7 - called-AE-title-not-recognized	-
	2 - DICOM UL service provider (ACSE related function)	1 - no-reason-given	-
		2 - protocol-version-not-supported	-
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	-
		2 - local-limit-exceeded	-

The behavior of the AE to send an association abort is summarized in next table.

Table 88: Association Abort Policies

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	-
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	-
	1 - unrecognized-PDU	-
	2 - unexpected-PDU	-
	4 - unrecognized-PDU parameter	-
	5 - unexpected-PDU parameter	-
	6 - invalid-PDU-parameter value	-

4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The Mobile C-Arm provides DICOM 3.0 TCP/IP Network Communication Support as defined in [DICOM] PS 3.8.

For the Mobile C-Arm AE the TCP/IP stack is inherited from the VxWorks operating system.

For the ViewForum Surgical Workstation AE and the 3D-RX Workstation AE the TCP/IP stack is inherited from the Windows XP operating system.

The Mobile C-Arm supports Ethernet (ISO 8802-3) and IEEE 802.3 (10 / 100 BASE-T) for the printer and image interfaces.

4.3.2. Additional Protocols

Not applicable

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

Notes:

- The configuration of a Mobile C-Arm AE is done by means of a web-based service program called BV-Scope.
- The configuration of a ViewForum Surgical Workstation AE is done by means of a configuration program, which is accessible at start-up (password protected, intended to be used by Philips Customer Support Engineers only).
- The configuration of a 3D-RX Workstation AE is done by means of service user tool.

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

4.4.1.1. Local AE Titles

Per default the Mobile C-Arm AE Application Entity Title is "No Name". At installation the Customer Support Engineer can change the host name. The Mobile C-Arm AE can be changed independently.

Table 89: AE Title configuration table

Application Entity	Default AE Title	Default TCP/IP Port
Mobile C-Arm AE	"No Name"	104
		8104 (Storage Commitment, fixed)
ViewForum Surgical Workstation AE	"VF1"	3010
3D-RX Workstation AE	"XVexport"	3110
	"XVexportvol"	3110
	"XVprint"	3110

4.4.1.2. Remote AE Title/Presentation Address Mapping

Specified is here the configuration of the remote application.

Remote Association Initiators

The following information must be provided for all relevant remote applications that are able to initiate DICOM associations to the Mobile C-Arm system:

- The Application Entity Title.
- The host name/IP address on which the remote application resides
- The port number at which the remote application has to sent association requests
- The SOP classes and transfer syntaxes for which the ViewForum Surgical Workstation AE accepts associations.

Remote Association Acceptors

The following information must be provided for all relevant remote applications that are able to accept DICOM associations from Mobile C-Arm AE:

- The Application Entity Title.
- The host name/IP address on which the remote application resides.
- The port number at which the remote application accepts association requests.

4.4.2. Parameters

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

The configuration parameters of the Mobile C-Arm AE are given in the following table, categorized in the following sections:

- Local System Parameters
- Export Target(s) (Store) Parameters
- Export Target(s) (Print) Parameters
- Worklist Management Target Parameters
- MPPS Target Parameters
- Storage commit (N-EVENT-REPORT) Parameters

Table 90: Configuration Parameters table for Mobile C-Arm AE

Parameter	Configurable	Default Value
AE Specific Parameters		
SOP Class support	Yes	MPPS Storage Commitment Printer
Local System Parameters		
AE Title	Yes	"No Name"
Host Name	Yes	"No Name"
IP Address	Yes	0.0.0.0
Subnet Mask	Yes	0.0.0.0
Default Gateway	Yes	0.0.0.0
Interpolation (on/off)	Yes	On
Max. PDU size	Yes	28672 (4..256 kb)
Receive Message Timeout	Yes	60 [s] (0..3600 s)
Association Close Timeout	Yes	1 [s] (0..3600 s)
Association Reply Timeout	Yes	60 [s] (0..3600 s)
Association Release Timeout	Yes	60 [s] (0..3600 s)
Network Write Timeout	Yes	60 [s] (0..3600 s)
Network Connect Timeout	Yes	60 [s] (0..3600 s)
Network Inactivity Timeout	Yes	60 [s] (0..3600 s)

Parameter	Configurable	Default Value
Export Target(s) (Store) Parameters		
AE Title	Yes	"No Name"
Name	Yes	Max. 25 char. Unique
IP Address	Yes	0.0.0.0
Port number	Yes	104
Type	Yes	STORE
Storage Commit - AE Title	Yes	"No Name"
Storage Commit - IP Address	Yes	0.0.0.0
Storage Commit - Port number	Yes	104
Export Triggers MPPS	Yes	"No"
Storage Commit - Enable/Disable	Yes	Disable
Export Target(s) (Print) Parameters		
AE Title	Yes	"No Name"
Name	Yes	Max. 25 char. Unique
IP Address	Yes	0.0.0.0
Port number	Yes	104
Type	Yes	PRINT
Printer type	Yes	Predefined List
Printer Priority	Yes	LOW
Film Destination	Yes	CURRENT
Film Orientation	Yes	PORTRAIT
Film Size	Yes	CURRENT
Border Density	Yes	BLACK
Border Density Value	Yes	1
Number of Copies	Yes	1
Magnification Type	No	Depending on Printer Type
Smoothing Type	No	Depending on Printer Type
Minimum Density	No	Depending on Printer Type
Maximum Density	No	Depending on Printer Type
Empty Image Density	No	Depending on Printer Type
Polarity	No	Depending on Printer Type
Trim	No	Depending on Printer Type
Configuration Information	No	Depending on Printer Type
Worklist Management Target Parameters		
AE Title	Yes	"No Name"
Name	Yes	Max. 25 char. Unique
IP Address	Yes	0.0.0.0
Port Number	Yes	104
Type	Yes	MWL
Select Query	Yes	Predefined Query List, maximum 4 items in the list
Define Query	Yes	Defines the queries that can be selected
MPPS Target Parameters		
AE Title	Yes	"No Name"
Name	Yes	Max. 25 char. Unique
IP Address	Yes	0.0.0.0
Port Number	Yes	104
Type	Yes	MPPS
Protocol Names	Yes	List of Protocol Names that can be selected in the MPPS panel
Enable Append Case	Yes	"Yes"

Parameter	Configurable	Default Value
MPPS also for unscheduled cases	Yes	"Yes"
Storage commit (N-EVENT-REPORT) Parameters		
AE Title	Yes	Local System AE Title
IP Address	Yes	Local System IP address
Port Number	No	Fixed: 8104

Note: Parameters that are part of a specific DICOM IOD are specified in section 4 and 8.

Table 91: Configuration Parameters table for ViewForum Surgical Workstation AE

Parameter	Configurable	Default Value
General Parameters		
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	-
General DIMSE level time-out values	No	-
Time-out waiting for response to TCP/IP connect request. (Lowlevel timeout)	No	-
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	-
Time-out for waiting for data between TCP/IP packets. (Lowlevel timeout)	No	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
Local Configurable AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can sent	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous Associations by Service and/or SOP Class	No	-
SOP Class support	Yes	-
Transfer Syntax support	Yes	-
Remote Configurable AE Specific Parameters		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can sent	No	-
AE specific DIMSE level time-out values	No	-
Number of simultaneous Associations by Service and/or SOP Class	No	-
SOP Class support	Yes	-
Transfer Syntax support	Yes	-

Note: The JPEG Baseline transfer syntax is only supported for RGB and YBR_FULL_422 images; therefore JPEG Baseline may NOT be configured for systems that are capable of handling storage of monochrome images too.

Table 92: Configuration Parameters table for 3D-RX Workstation AE

Parameter	Configurable	Default Value
Local Configurable AE Specific Parameters		
Exam ID	Yes	The Exam ID can be set either to Accession Number, Requested Procedure ID, Study ID, or Study Instance UID.

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 DICOM media interchange implementation of the Mobile C-Arm is implemented in the 3D-RX Workstation AE and in the ViewForum Surgical Workstation AE. The following figures show the Media Interchange Application Data Flow as a functional overview of the 3D-RX Workstation AE and the ViewForum Surgical Workstation AE for CD and DVD medium.

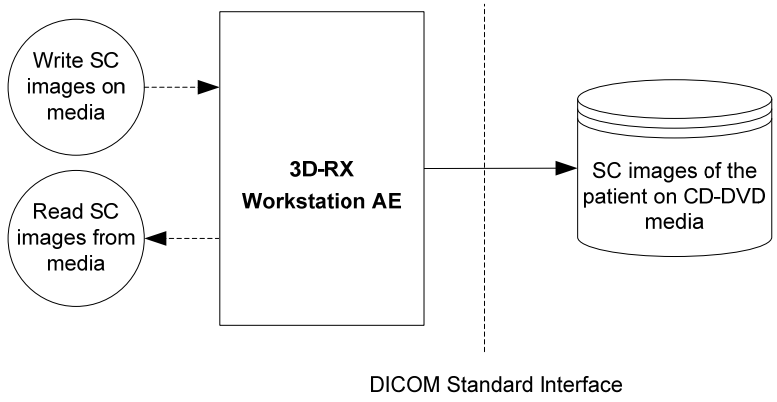

Figure 22: Application Data Flow Diagram (3D-RX Workstation AE)

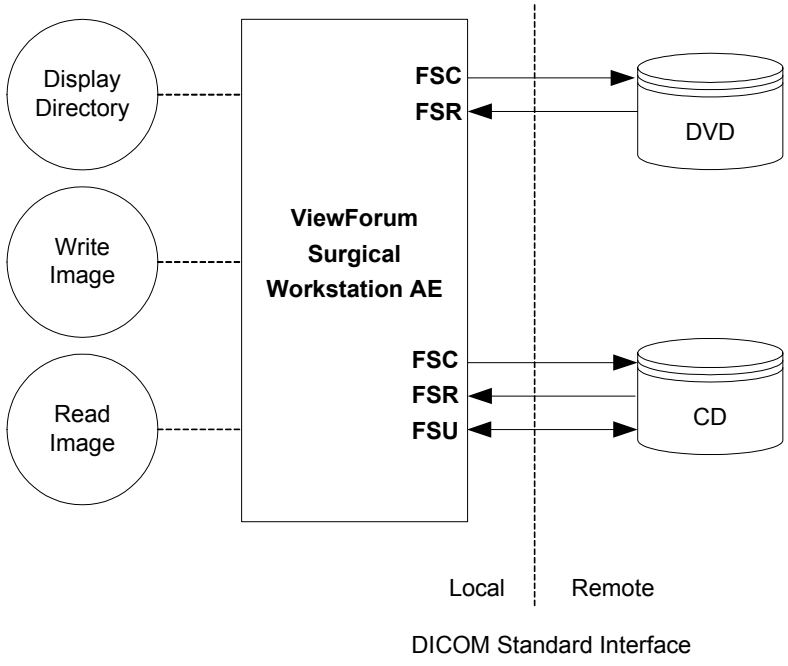

Figure 23: Application Data Flow Diagram (ViewForum Surgical Workstation AE)

The ViewForum Surgical Workstation AE will act as a FSR, for CD, DVD and USB media, when reading the directory of the medium. The ViewForum Surgical Workstation AE will act as a FSC / FSU for a CD and as FSC for DVD, when writing the selected images in a patient folder onto the DICOM medium.

The ViewForum Surgical Workstation AE supports the media profiles as shows in the table below.

Table 93: Media Profiles supported by ViewForum Surgical Workstation AE

Application Profile	CD	DVD+RW / DVD+R	USB
General Purpose	STD-GEN-CD	STD-GEN-DVD	STD-GEN-USB

Note that DVD-R and DVD-RW medium can be Read but are not supported for Writing. After the data is written to DVD, the DVD will be finalized after the burning process has finished for the ViewForum Surgical Workstation AE.

When data is written to DVD+R and DVD-R, of the 3D-RX Workstation AE, the media is not automatically finalized. Finalizing must be done here manually by the user.

Supported Photometric Interpretations

The ViewForum Surgical Workstation AE supports images with the following DICOM Photometric Interpretations as shows in the table below.

Table 94: Photometric interpretations supported by ViewForum Surgical Workstation AE

Photometric Interpretation	Import	Export	Viewing
MONOCHROME1	YES	YES	YES
MONOCHROME2	YES	YES	YES
PALETTE COLOR	YES	YES	NO
RGB	YES	YES	YES
YBR_FULL	YES	YES	NO
YBR_FULL_422 (see note)	YES	YES	NO
YBR_PARTIAL_422	YES	YES	NO
YBR_RCT	YES	YES	NO
YBR_ICT	YES	YES	NO

Note: If the photometric interpretation YBR_FULL_422 is used in combination with transfer syntax JPEG-lossy then the pixel data is converted to RGB on import.

The ViewForum Surgical Workstation AE supports images with Lossy image compression via JPEG as described as shows in the table below.

Table 95: JPEG coding supported by ViewForum Surgical Workstation AE

DICOM Transfer Syntax UID	JPEG coding process	JPEG description
1.2.840.10008.1.2.4.50	1	Lossy, Baseline (JPEG 8 Bit Image Compression)

Note: Lossy Compression is only supported for images with photometric interpretation RGB and YBR_FULL_422 and therefore ViewForum Surgical Workstation AE supports this only for Ultrasound Images.

5.1.2. Functional Definitions of AE's

This section contains the functional definition of each individual local Media Application Entity.

The ViewForum Surgical Workstation AE implements the following functions for DICOM media.

DICOM Media Storage Service Class for CD, DVD and USB media

The ViewForum Surgical Workstation AE can perform the CD DICOM Media Storage service as SCU, with capabilities for:

- RWA Display Directory (as FSR),
- RWA Write Images (as FSC / FSU), and
- RWA Read Images (as FSR).

The ViewForum Surgical Workstation AE can perform the DVD DICOM Media Storage service as SCU, with capabilities for:

- RWA Display Directory (as FSR),
- RWA Write Images (as FSC), and
- RWA Read Images (as FSR).

The ViewForum Surgical Workstation AE can perform the USB DICOM Media Storage service as SCU, with capabilities for:

- RWA Display Directory (as FSR),
- RWA Write Images (as FSC / FSU), and
- RWA Read Images (as FSR).

5.1.3. Sequencing of Real World Activities

This section contains a description of sequencing of Real-World Activities that the Media Application Entities require.

Whenever DICOM Media (CD or DVD) has to be written, the ViewForum Surgical Workstation AE first tries to read the DICOMDIR. The ViewForum Surgical Workstation AE will compile the updated DICOMDIR and any required DICOM images into a CD or DVD session image; this session image will be written to the DICOM Media.

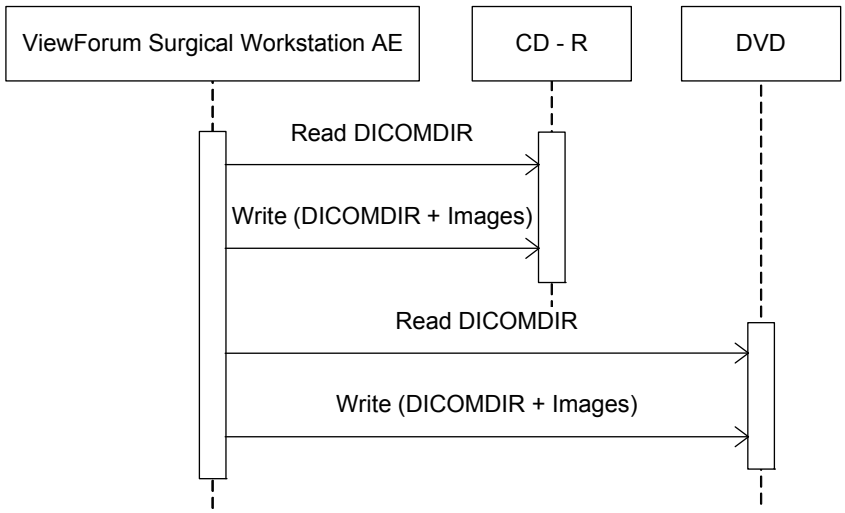

Figure 24: Sequencing of RWA Write Image

Note that after the DVD Media is written the DVD will be finalized by ViewForum Surgical Workstation AE to guarantee the readability on the most DVD reader.

5.2. AE Specifications

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

5.2.1. ViewForum Surgical Workstation AE Media - Specification

This section contains general policies that apply to all of the Application Entities described in subsequent section.
The ViewForum Surgical Workstation AE provides standard conformance to the DICOM interchange option of the Media Storage service class, and follows the specifications as defined in [DICOM] Media Storage and File Format for Data Interchange (PS 3.10) the Media Storage Application Profiles STD-GEN-CD, STD-GEN-USB-JPEG ([DICOM] PS 3.11) and the Media Storage Application Profiles STD-GEN-DVD-JPEG ([DICOM] PS 3.12) for Reading and Writing.

The ViewForum Surgical Workstation AE supports multi-patient and multi-session for CD and DVD, both for reading and writing.
Supported media by ViewForum Surgical Workstation AE are:

- For CD: CD R and CD RW with the profile: STD-GEN-CD
- For DVD: DVD+R and DVD+RW with the profile STD-GEN-DVD-JPEG
- The supported Transfer Syntax is ELE uncompressed
- DVD-R and DVD-RW can be read only, but are not supported for writing

The Application Profiles and roles are listed below:

Table 96: AE ViewForum Surgical Workstation AE related Application Profiles, RWA activities and roles

Supported Application Profile	Identifier	Real-World Activities	Roles
General Purpose CD-R Interchange	STD-GEN-CD	Update File-set	FSU
		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 USB Media Interchange with JPEG	STD-GEN-USB-JPEG	Update File-set	FSU
		Create File-set	FSC
		Read File-set	FSR

5.2.1.1. File Meta Information for the ViewForum Surgical Workstation AE

This section shall contain the values of the file Meta information that pertain to the Application Entity (see PS 3.10).

The Source Application Entity Title is configurable (ref. section 5.4).

Table 97: File Meta Information for the ViewForum Surgical Workstation AE

Implementation Class UID	1.3.46.670589.5.2.23
Implementation Version Name	ViewForum R6.3

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 describe here.

Display Directory

When a Database Open action is initiated on DICOM media, the ViewForum Surgical Workstation AE will acts as an FSR using the interchange option to read the DICOMDIR of the DICOM media. This will result in an overview of the patients, studies, series, and images on the GUI.

Read Image

When an image transfer from DICOM media is initiated then the ViewForum Surgical Workstation AE acts as an FSR using the interchange option to import SOP instances from the DICOM media.

5.2.1.2.1.1. Media Storage Application Profile

The application Profile that is used by this Media Application Entity is specified in this section.

Display Directory

The ViewForum Surgical Workstation AE supports the RWA Display Directory for STD-GEN-DVD-JPEG, STD-GEN-USB-JPEG and the STD-GEN-CD application profiles.

Read Image

The ViewForum Surgical Workstation AE supports the RWA Read Image for STD-GEN-DVD-JPEG, STD-GEN-USB-JPEG and the STD-GEN-CD application profiles.

5.2.1.2.1.1.1. Options

The options used in the the Application Profile are specified in detail in this section.

Display Directory

The mandatory DICOMDIR keys are required for the correct display of directory information. The display is structured according the DICOM Composite Information Model: Patient, Study, Series, and Image.

Read Image

The mandatory attributes of the DICOM images are required for the correct storage of the images in the local database. Optional attributes and retired/private attributes are stored too - if present; this is equivalent with the level 2 (Full) conformance for the Storage service class in the Network support.

5.2.1.2.2. RWA - Create File-set

This Media Application Entity has a File-set Create functionality which is describe here.

When an image transfer to DICOM media is initiated then the ViewForum Surgical Workstation AE acts as an FSC using the interchange option to write SOP instances on the DICOM media.

5.2.1.2.2.1. Media Storage Application Profile

The application Profile that is used by this Media Application Entity is specified in this section.

The ViewForum Surgical Workstation AE supports the RWA Write Image for STD-GEN-DVD-JPEG, STD-GEN-USB-JPEG and the STD-GEN-CD application profiles. However, the ViewForum Surgical Workstation AE only supports writing on DVD+R and DVD+RW media, not for DVD-R and DVD-RW media.

5.2.1.2.2.1.1. Options

The options used in the Application Profile are specified in detail in this section.

The DICOMDIR file will be extended when new images are written to the medium. In case some attributes are not present in an image but are specified as mandatory in the DICOMDIR definition of DICOM media, a generated value will be filled in.

Implementation remarks and restrictions

When writing the DICOMDIR records, key values are generated when no value of the corresponding attribute is supplied, according to the following table.

Table 98: Generated Keys

Key	Tag	Generated Value
Patient Keys		
Patient ID	0010,0020	At import the ViewForum Surgical Workstation AE each time creates a new value based on the Study Instance UID for each new study written to DICOM media (even if this study belongs to a patient recorded earlier). Otherwise the default generated value shall be a succession of "UNKNOWN", the Patient's Name, the Patient's Birth Date, and the Patient's Sex, concatenated by using underscore characters.
Study Keys		
Study Date	0008,0020	Current date
Study Time	0008,0030	Current time
Study ID	0020,0010	"UNKNOWN"
Series Keys		
Series Number	0020,0011	1
Image Keys		
Instance Number	0020,0013	1

The default value for (0028,1040) Pixel Intensity Relationship is set to DISP.

The ViewForum Surgical Workstation AE can write volumes of the media to that media.

If multi media is required then the ViewForum Surgical Workstation AE asks for a new media.

5.2.1.2.3. RWA - Update File-set

This Media Application Entity has a File-set Updater functionality which is describe here.

5.2.1.2.3.1. Media Storage Application Profile

The application Profile that is used by this Media Application Entity is specified in this section.

The ViewForum Surgical Workstation AE supports the RWA Update File-set for the STD-GEN-USB-JPEG and STD-GEN-CD application profiles.

5.2.1.2.3.1.1. Options

Not applicable.

5.2.2. 3D-RX Workstation AE Media - Specification

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

The Application Profiles and Roles are listed below (note: Secondary Capture images only).

Table 99: AE 3D-RX Workstation AE related Application Profiles, RWA activities and roles

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

5.2.2.1. File Meta Information for the 3D-RX Workstation AE

This next table specified the list of values assigned to the File Meta Information attributes that pertain to the Implementation Class and Version.

Table 100: File Meta Information for the 3D-RX Workstation AE

Implementation Class UID	1.3.46.670589.7.8.7.2
Implementation Version Name	XV_rel_7.2.1

5.2.2.2. Real-World Activities

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

5.2.2.2.1. RWA - Create File-set

This Media Application Entity has a File-set Create functionality which is describe here.

After one or more patients are selected, the operator can choose to store the data onto a portable medium (CD or DVD). All Secondary Capture images belonging to all the selected patients will be stored on the portable medium in DICOM media format.
Though the entire patient data can extend to more than one CD or DVD, the DICOM Secondary Capture images are stored in the first CD or DVD itself. Hence, if the user wants to read the secondary capture images at a DICOM File-Set-Reader (FSR), he/she only needs the first CD or DVD of the series. If the data of a single directory is too large (for example, an XperCT run), then it has to be written to DVD's. In this case, it will not be possible to write this data to multiple CD's.

Table 101: SOP Classes and Transfer Syntaxes

IOD	SOP Class	Transfer Syntax and UID	FSC	FSR	FSU
Basic Directory	1.2.840.10008.1.3.10	ELE 1.2.840.10008.1.2.1	YES	YES	NO
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	ELE 1.2.840.10008.1.2.1	YES	YES*	NO

* Note that the File Set Reader (FSR) functionality will be supported for Specializing non-DICOM information only.

The 3D-RX Workstation AE will not delete any snapshots, which are already written to the File Set.

5.2.2.2.1.1. Media Storage Application Profile

The application Profile that is used by this Media Application Entity is specified in this section.

The 3D-RX Workstation AE supports the RWA Create File-set for STD-GEN-DVD-JPEG and STD-GEN-CD application profiles.

5.2.2.2.1.1.1. Options

The following data is de-identified when the de-identification feature is switched on:

Table 102: De-identified Attributes

DICOM Attribute name	Tag	De-identification details
Patient's Name	0010,0010	Default shown in the de-identification dialog, or as selected by the user
Patient's Birth Date	0010,0030	Day and month changed to 1st January. Year modified only if patient is more than 90 years old. In this case, age made equal to 90.
Patient ID	0010,0020	Randomly generated unique identifier
Study Date	0008,0020	Day and month changed to 1st January. (yyyy0101)
Accession Number	0008,0050	An integer value
Series Date	0008,0021	Day and month changed to 1st January. (yyyy0101)

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 AUG-GEN-DVD-JPEG

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

Note: This section is applicable only to the ViewForum Surgical Workstation AE. This section is not applicable to the 3D-RX Workstation AE.

5.3.1.1.1. SOP Class Augmentations

The additional SOP Classes beyond those specified in the Standard Application Profile on which this Augumented Application Profile is based are described in this section.

As augmentation to the STD-GEN-DVD-JPEG application profile, also the SOP classes as per following table are supported.

Table 103: Additional SOP Classes supported by AUG-GEN-DVD-JPEG

SOP Class Name	SOP Class UID
X-Ray Specialization	1.3.46.670589.2.3.1.1
Stack of X-Ray	1.3.46.670589.2.4.1.1
Volume	1.3.46.670589.5.0.1.1
3D Volume Object	1.3.46.670589.5.0.2.1
Surface	1.3.46.670589.5.0.3.1
Cardio	1.3.46.670589.5.0.8.1
CT Synthetic Image	1.3.46.670589.5.0.9
MR Synthetic Image	1.3.46.670589.5.0.10
MR Cardio Analysis	1.3.46.670589.5.0.11.1
CX Synthetic Image	1.3.46.670589.5.0.12

SOP Class Name	SOP Class UID
Perfusion	1.3.46.670589.5.0.13
Perfusion Analysis	1.3.46.670589.5.0.14

5.3.1.1.2. Directory Augmentations

Not applicable.

5.3.1.1.3. Other Augmentations

Not applicable.

5.3.2. Private Application Profiles

Not applicable.

5.4. Media Configuration

Any configuration issues may be found in the Networking section 4.4.

6. Support of Character Sets

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

Table 104: 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
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
Default repertoire	-	-	ISO-IR 6	G0	ISO 646
		-	-	-	-

If a WLM query response includes a Person Name attribute containing character code 5C (i.e. BACKSLASH "\" in ISO-IR 6) then all characters behind the character code 5C will be omitted (at GUI and export, i.e. will still be present in MPPS).

Unsupported character sets will be accepted, though all characters will be displayed as per ISO_IR 100, not conform the actual character set specification.

7. Security

7.1. Security Profiles

7.1.1. Security use Profiles

Not applicable

7.1.2. Security Transport Connection Profiles

Not applicable

7.1.3. Digital Signature Profiles

Not applicable

7.1.4. Media Storage Security Profiles

Not applicable

7.1.5. Attribute Confidentiality Profiles

The Mobile C-Arm AE conforms to the Basic Application Level Confidentiality Profile as de-identifier.

De-identified SOP Instances will be created on DICOM Media if specified by the user.

No instances of the Encrypted Attributes Data Set are created. No transfer syntaxes are supported for encoding/decoding of Encrypted Attributes Data Sets.

The terms used to describe the replacement value in the de-identified patient data can be read as follows:

- COPY: Same value as in source data
- EMPTY: The attribute will have a value of zero length.
- ANP: Attribute Not Present
- n.a.: Not applicable, the attribute is not contained in the standard IOD of the Mobile C-Arm AE

The next table lists the protected data attributes.

Table 105: Basic Application Level Confidentiality Profile Attributes

Name	Tag	VR	Replacement Value
Instance Creator UID	0008,0014	UI	n.a.
SOP Instance UID	0008,0018	UI	COPY
Accession Number	0008,0050	SH	EMPTY
Institution Name	0008,0080	LO	ANP
Institution Address	0008,0081	ST	n.a.
Referring Physician's Name	0008,0090	PN	EMPTY
Referring Physician's Address	0008,0092	ST	n.a.
Referring Physician's Telephone Numbers	0008,0094	SH	n.a.
Station Name	0008,1010	SH	COPY

Name	Tag	VR	Replacement Value
Study Description	0008,1030	LO	COPY
Series Description	0008,103E	LO	COPY
Institutional Department Name	0008,1040	LO	n.a.
Physician(s) of Record	0008,1048	PN	n.a.
Performing Physicians' Name	0008,1050	PN	ANP
Name of Physician(s) Reading Study	0008,1060	PN	n.a.
Operators' Name (Technologist)	0008,1070	PN	COPY
Admitting Diagnoses Description	0008,1080	LO	n.a.
Referenced SOP Instance UID	0008,1155	UI	COPY
Derivation Description	0008,2111	ST	COPY
Patient's Name	0010,0010	PN	EMPTY
Patient ID	0010,0020	LO	In Patient Module the Patient ID value is "EMPTY". In the DIRECTORY RECORD: 0 (PATIENT) the Patient ID value has a new generated value
Patient's Birth Date	0010,0030	DA	EMPTY
Patient's Birth Time	0010,0032	TM	COPY
Patient's Sex	0010,0040	CS	EMPTY
Other Patient Ids	0010,1000	LO	COPY
Other Patient Names	0010,1001	PN	COPY
Patient's Age	0010,1010	AS	EMPTY
Patient's Size	0010,1020	DS	COPY
Patient's Weight	0010,1030	DS	COPY
Medical Record Locator	0010,1090	LO	n.a.
Ethnic Group	0010,2160	SH	n.a.
Occupation	0010,2180	SH	n.a.
Additional Patient's History	0010,21B0	LT	n.a.
Patient Comments	0010,4000	LT	n.a.
Device Serial Number	0018,1000	LO	COPY
Protocol Name	0018,1030	LO	COPY
Study Instance UID	0020,000D	UI	COPY
Series Instance UID	0020,000E	UI	COPY
Study ID	0020,0010	SH	EMPTY
Frame of Reference UID	0020,0052	UI	n.a.
Synchronization Frame of Reference UID	0020,0200	UI	n.a.
Image Comments	0020,4000	LT	COPY
Requested Attributes Sequence	0040,0275	SQ	n.a.
UID	0040,A124	UI	n.a.
Content Sequence	0040,A730	SQ	n.a.
Storage Media File-set UID	0088,0140	UI	n.a.
Referenced Frame of Reference UID	3006,0024	UI	n.a.
Related Frame of Reference UID	3006,00C2	UI	n.a.

SOP Class Augmentations

DICOM media that have been written with the de-identification feature switched on (anonymized data) will have DICOM-format data.

In case of writing to CD, DVD or USB media, de-identification is supported. However, when the de-identification feature is active, also Secondary Capture images are written to the DICOM media; it is possible that they contain burned-in patient information.

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

Not applicable

7.2. Association Level Security

Not supported. Any calling AE title and/or IP address may open an association.

7.3. Application Level Security

Not applicable.

8. Annexes of application "Mobile C-Arm AE"

8.1. IOD Contents

8.1.1. Created SOP Class Instances

This section specifies each created IOD by this application.

This section specifies each IOD created (including each private IOD). 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 106: List of created SOP Classes

SOP Class Name	SOP Class UID
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1

8.1.1.2. Secondary Capture Image Storage SOP Class

Table 107: IOD of Created Secondary Capture Image Storage SOP Class Instances

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

Series	General Series Module	ALWAYS
Equipment	General Equipment Module	CONDITIONAL
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	SOP Common Module	ALWAYS

Table 108: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		VNAP	MWL	-
Other Patient Names	0010,1001	PN		VNAP	MWL	-
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	-
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	-
Patient's Birth Time	0010,0032	TM		VNAP	MWL	-
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	-
Patient's Sex	0010,0040	CS	F, M, O	ALWAYS	MWL, USER	-

Table 109: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ALWAYS	MWL, USER	-
Referring Physician's Name	0008,0090	PN		VNAP	MWL	-
Study Date	0008,0020	DA		ALWAYS	AUTO	<yyyymmdd>
Study Description	0008,1030	LO		ALWAYS	AUTO, MWL	Copied from either Requested Procedure description' (0032,1060) or the 'Scheduled Procedure Step description' (0040,0007). If the MWL attribute is empty the Examination Type is used instead.
Study ID	0020,0010	SH		ALWAYS	MWL	From Requested Procedure ID (0040,1001) of MWL
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	-
Study Time	0008,0030	TM		ALWAYS	AUTO	<hhmmss>
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	From Requested Procedure Code Sequence (0008,1032) of MWL. If empty in MWL, should not be present in Image IOD
>Code Meaning	0008,0104	LO		ALWAYS	MWL	-
>Code Value	0008,0100	SH		ALWAYS	MWL	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	-
>Coding Scheme Version	0008,0103	SH		ANAP	MWL	-
Referenced Study Sequence	0008,1110	SQ		ANAP	MWL	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL	-

Table 110: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Weight	0010,1030	DS		VNAP	MWL	-

Table 111: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Laterality	0020,0060	CS		EMPTY	FIXED	-
Performing Physician's Name	0008,1050	PN		VNAP	MWL, USER	Copied from scheduled performing physician's name if this provided by MWL or can be entered by Operator.
Protocol Name	0018,1030	LO		VNAP	AUTO	Entered by the user in the MPPS panel is used in MPPS N-SET. same will be copied to Image Storage.
Series Date	0008,0021	DA		ALWAYS	AUTO	for Dose Reports Export Date will be used.
Series Description	0008,103E	LO		ALWAYS	AUTO	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	for Dose Reports Export Time will be used.
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAPCV	AUTO	-
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ALWAYS	MWL	-
>Requested Procedure Description	0032,1060	LO		ALWAYS	MWL	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	-
>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	MWL	-
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		ALWAYS	MWL	-
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	-
>>Code Value	0008,0100	SH		ALWAYS	MWL	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	-
>>Coding Scheme Version	0008,0103	SH		ANAP	MWL	-
Performed Procedure Step Description	0040,0254	LO		ALWAYS	AUTO	same as Study Description (0008,1030)
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	internal counter
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	Examination Date
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	Examination Time

Table 112: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ANAP	CONFIG	Hospital Name
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	Philips Medical Systems
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	"BV Pulsera" or "Veradius" depending on the system type.

Station Name	0008,1010	SH		ALWAYS	CONFIG	-

Table 113: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Conversion Type	0008,0064	CS	DI	ALWAYS	AUTO	-
Modality	0008,0060	CS	XA	ALWAYS	AUTO	XA, for Dose report only OT
Secondary Capture Device ID	0018,1010	LO		ALWAYS	CONFIG	BV System ID
Secondary Capture Device Manufacturer	0018,1016	LO	Philips Medical Systems	ALWAYS	AUTO	Philips Medical Systems
Secondary Capture Device Manufacturer's Model Name	0018,1018	LO		ALWAYS	AUTO	"BV Pulsera" or "Veradius" depending on the system type.
Secondary Capture Device Software Version(s)	0018,1019	LO	Value 1: PH Mobile C R3.2	ALWAYS	AUTO	-

Table 114: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	<yyyymmdd>
Content Time	0008,0033	TM		ALWAYS	AUTO	<hhmmss>
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	Generated running number
Patient Orientation	0020,0020	CS		EMPTY	FIXED	-

Table 115: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	-
Bits Stored	0028,0101	US	12	ALWAYS	AUTO	-
Columns	0028,0011	US	1024	ALWAYS	AUTO	For images with text: 1280
High Bit	0028,0102	US	11	ALWAYS	AUTO	-
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	-
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	-
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	-
Rows	0028,0010	US	1024	ALWAYS	AUTO	-
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	-

Table 116: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	-
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	-

Table 117: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	Required if expanded/replacement character set used

8.1.1.3. X-Ray Angiographic Image Storage SOP Class

Table 118: IOD of Created X-Ray Angiographic Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	Cine Module	ALWAYS
	Multi-Frame Module	ALWAYS
	X-Ray Image Module	ALWAYS
	X-Ray Acquisition Module	ALWAYS
	XA Positioner Module	ALWAYS
	SOP Common Module	ALWAYS

Table 119: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		VNAP	MWL	-
Other Patient Names	0010,1001	PN		VNAP	MWL	-
Patient ID	0010,0020	LO		ALWAYS	MWL, USER	-
Patient's Birth Date	0010,0030	DA		ALWAYS	MWL, USER	-
Patient's Birth Time	0010,0032	TM		VNAP	MWL	-
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	-
Patient's Sex	0010,0040	CS	F, M, O	ALWAYS	MWL, USER	-

Table 120: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ALWAYS	MWL, USER	-
Referring Physician's Name	0008,0090	PN		VNAP	MWL	-
Study Date	0008,0020	DA		ALWAYS	AUTO	<yyyymmdd>
Study Description	0008,1030	LO		ALWAYS	AUTO, MWL	Copied from either Requested Procedure description' (0032,1060) or the 'Scheduled Procedure Step description' (0040,0007). If the MWL attribute is empty the Examination Type is used instead.
Study ID	0020,0010	SH		VNAP	FIXED	From Requested Procedure ID (0040,1001) of MWL
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	-
Study Time	0008,0030	TM		ALWAYS	AUTO	<hhmmss>

Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	From Requested Procedure Code Sequence (0008,1032) of MWL. If empty in MWL, should not be present in Image IOD
>Code Meaning	0008,0104	LO		ALWAYS	MWL	-
>Code Value	0008,0100	SH		ALWAYS	MWL	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	-
>Coding Scheme Version	0008,0103	SH		ANAPCV	MWL	-
Referenced Study Sequence	0008,1110	SQ		ANAP	MWL	-
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.1	ALWAYS	MWL	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL	-

Table 121: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Weight	0010,1030	DS		VNAP	MWL	-

Table 122: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Laterality	0020,0060	CS		EMPTY	FIXED	-
Modality	0008,0060	CS	XA	ALWAYS	AUTO	-
Performing Physician's Name	0008,1050	PN		VNAP	MWL, USER	Copied from scheduled performing physician's name if this provided by MWL or can be entered by Operator.
Protocol Name	0018,1030	LO		VNAP	AUTO	entered by the user in the MPPS panel is used in the MPPS N-SET. Same will be copied to image storage
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Description	0008,103E	LO		ANAP	AUTO	Depending on 3D Run. Applied values: 3DRAanypos, 3DRApatient (normal 3D run). 3DRAanypos, 3DRAdodec (geometry calibration). 3DRAanypos, 3DRApincus (pincushion calibration).
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	increasing number that identifies series (run)
Series Time	0008,0031	TM		ALWAYS	AUTO	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAPCV	AUTO	-
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ALWAYS	MWL	-
>Requested Procedure Description	0032,1060	LO		ALWAYS	MWL	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	-
>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	MWL	-
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	MWL	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		ALWAYS	MWL	-
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	-
>>Code Value	0008,0100	SH		ALWAYS	MWL	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	-
>>Coding Scheme Version	0008,0103	SH		ANAP	MWL	-

Performed Procedure Step Description	0040,0254	LO		ALWAYS	MPPS	Copied from either Requested Procedure description' (0032,1060) or the 'Scheduled Procedure Step description' (0040,0007). If the MWL attribute is empty the Examination Type is used instead.
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	internal counter.
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	-
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	-

Table 123: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ANAP	CONFIG	Hospital Name
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	Philips Medical Systems
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	"BV Pulsera" or "Veradius" depending on the system type.
Software Version(s)	0018,1020	LO	PH Mobile C R3.2	ALWAYS	AUTO	-
Station Name	0008,1010	SH		ALWAYS	CONFIG	-

Table 124: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	<yyyymmdd>
Content Time	0008,0033	TM		ALWAYS	AUTO	<hhmmss>
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Patient Orientation	0020,0020	CS		EMPTY	FIXED	-

Table 125: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US	1024	ALWAYS	AUTO	-
Pixel Data	7FE0,0010	OW /OB		ALWAYS	AUTO	-
Rows	0028,0010	US	1024	ALWAYS	AUTO	-

Table 126: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Cine Rate	0018,0040	IS		ANAP	AUTO	Calculated from acquisition speed.
Frame Time	0018,1063	DS		ALWAYS	AUTO	Calculated from acquisition speed [ms].
Frame Time Vector	0018,1065	DS		ANAP	AUTO	-
Recommended Display Frame Rate	0008,2144	IS		ANAP	AUTO	Acquisition speed
Start Trim	0008,2142	IS	1	ALWAYS	AUTO	-
Stop Trim	0008,2143	IS		ALWAYS	AUTO	Number of images in the run.

Table 127: Multi-Frame Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Frames	0028,0008	IS		ALWAYS	AUTO	number of exported images in the run.

Table 128: X-Ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	-
Bits Stored	0028,0101	US	12	ALWAYS	AUTO	-
Frame Increment Pointer	0028,0009	AT	0x00181063	ALWAYS	AUTO	-
High Bit	0028,0102	US	11	ALWAYS	AUTO	-
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY	ALWAYS	AUTO	-
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	-
Pixel Intensity Relationship	0028,1040	CS	LIN	ALWAYS	AUTO	-
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	-
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	-

Table 129: X-Ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Exposure	0018,1152	IS		EMPTY	FIXED	-
Field of View Shape	0018,1147	CS	ROUND	ALWAYS	AUTO	-
Grid	0018,1166	CS	IN	ALWAYS	AUTO	EMPTY for Veradius.
Imager Pixel Spacing	0018,1164	DS		ANAP	AUTO	Absent during detector format switch
Intensifier Size	0018,1162	DS	230, 265, 310	ALWAYS	AUTO	230 or 310 for BV Pulsera, 265 for Veradius.
KVP	0018,0060	DS		EMPTY	FIXED	-
Radiation Setting	0018,1155	CS	GR, SC	ALWAYS	AUTO	-
Type of Filters	0018,1161	LO	NONE	ALWAYS	AUTO	-
Pixel Spacing	0028,0030	DS		ANAP	AUTO	For 3D runs pixel spacing in center of rotation. For all other runs same as Imager Pixel Spacing (0018,1164). Absent during detector format switch.
Pixel Spacing Calibration Description	0028,0A04	LO		ANAP	AUTO	For 3D runs 'Pixel Spacing in center of rotation'. For all other runs absent.
Pixel Spacing Calibration Type	0028,0A02	CS	GEOMETRY	ANAP	AUTO	For 3D runs 'GEOMETRY'. For all other runs absent.

Table 130: XA Positioner Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Distance Source to Detector	0018,1110	DS	983, 993	ALWAYS	FIXED	983 for BV Pulsera, 993 for Veradius.
Distance Source to Patient	0018,1111	DS		ANAP	FIXED	Only present for 3D Acquisitions.
Positioner Motion	0018,1500	CS		ANAP	AUTO	EMPTY, Value present for 3D Acquisitions.
Positioner Primary Angle	0018,1510	DS	0, -101.5	ALWAYS	AUTO	0 for Non 3D Acquisitions. -101.5 for 3D Acquisitions.
Positioner Primary Angle Increment	0018,1520	DS		ANAP	FIXED	Only present for 3D Acquisitions.
Positioner Secondary Angle	0018,1511	DS	0	ALWAYS	FIXED	-
Positioner Secondary Angle Increment	0018,1521	DS	0	ANAP	FIXED	Only present for 3D Acquisitions.

Table 131: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.12.1	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	Required if expanded/replacement character set used

8.1.2. Usage of Attributes from Received IOD

Not applicable.

8.1.3. Attribute Mapping

The following mapping applies for attributes of the Mobile C-Arm AE.

Table 132: Attribute Mapping of the Mobile C-Arm AE

Attribute Name	MWL Tag	MPPS Create Tag	MPPS Set Tag	SC Tag	XA Tag
Specific Character Set (if present)	0008,0005	0008,0005	-	0008,0005	0008,0005
Accession Number	0008,0050	(0040,0270) >(0008,0050)	-	0008,0050	0008,0050
Referring Physician's Name	0008,0090	-	-	0008,0090	0008,0090
Referenced Study Sequence	(0008,1110)	(0040,0270) >(0008,1110)	-	0008,1110	0008,1110
> Referenced SOP Class UID	>(0008,1150)	>(0008,1150)	-	>(0008,1150)	>(0008,1150)
> Referenced SOP Instance UID	>(0008,1155)	>(0008,1155)	-	>(0008,1155)	>(0008,1155)
Referenced Patient Sequence	(0008,1120)	(0008,1120)	-	-	-
> Referenced SOP Class UID	>(0008,1150)	>(0008,1150)	-	-	-
> Referenced SOP Instance UID	>(0008,1155)	>(0008,1155)	-	-	-
Patient's Name	0010,0010	0010,0010	-	0010,0010	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020	0010,0020
Patient's Birth Date	0010,0030	0010,0030	-	0010,0030	0010,0030
Patient's Birth Time	0010,0032	-	-	0010,0032	0010,0032
Patient's Sex	0010,0040	0010,0040	-	0010,0040	0010,0040
Other Patient IDs	0010,1000	-	-	0010,1000	0010,1000
Other Patient Names	0010,1001	-	-	0010,1001	0010,1001
Patient's Weight	0010,1030	-	-	0010,1030	0010,1030
Study Instance UID	0020,000D	(0040,0270) >(0020,000D)	-	0020,000D	0020,000D
Requested Procedure Description	0032,1060	(0040,0270)	-	(0040,0275)	(0040,0275)
	-	>(0032,1060)	-	>(0032,1060)	>(0032,1060)
Scheduled Procedure Step Sequence	(0040,0100)	-	-	-	-
>Modality	>(0008,0060)	0008,0060	-	(0008,0060)	(0008,0060)
>Scheduled Station AE Title	>(0040,0001)	(0040,0242)	-	-	-
>Scheduled Procedure Step Start Date	>(0040,0002)	(0040,0244)	(0040,0250)	-	-
>Scheduled Procedure Step Start Time	>(0040,0003)	(0040,0245)	(0040,0251)	-	-

Attribute Name	MWL Tag	MPPS Create Tag	MPPS Set Tag	SC Tag	XA Tag
>Scheduled Performing Physician's Name. (Physician who makes the Examination)	>(0040,0006)	-	(0040,0340) >(0008,1050)	(0008,1050)	(0008,1050)
>Scheduled Procedure Step Description	>(0040,0007)	(0040,0270)	-	(0040,0275)	(0040,0275)
	-	>(0040,0007), (0040,0254)	-	>(0040,0007)	>(0040,0007)
>Scheduled Protocol Code Sequence	>0040,0008)	(0040,0270)	-	(0040,0275)	(0040,0275)
	-	>(0040,0008)	-	>(0040,0008)	>(0040,0008)
>>Code Value	>>(0008,0100)	>>(0008,0100)	-	>>(0008,0100)	>>(0008,0100)
>>Coding Scheme Designator	>>(0008,0102)	>>(0008,0102)	-	>>(0008,0102)	>>(0008,0102)
>>Coding Scheme Version	>>(0008,0103)	>>(0008,0103)	-	>>(0008,0103)	>>(0008,0103)
>>Code Meaning	>>(0008,0104)	>>(0008,0104)	-	>>(0008,0104)	>>(0008,0104)
>Scheduled Procedure Step ID	>(0040,0009)	(0040,0270)	-	(0040,0275)	(0040,0275)
	-	>(0040,0009)	-	>0040,0009)	>0040,0009)
>Scheduled Station Name	>(0040,0010)	>(0040,0242)	-	(0040,0010)	(0040,0010)
Requested Procedure ID	(0040,1001)	(0040,0270)	-	(0040,0275)	(0040,0275)
	-	>(0040,1001), (0020,0010)		>(0040,1001), (0020,0010)	>(0040,1001), (0020,0010)
Performed Procedure Step ID	-	(0040,0253)	-	(0040,0253)	(0040,0253)
Performed Procedure Step Description	0040,0254	0040,0254	0040,0254	(0040,0254), (0008,1030)	(0040,0254), (0008,1030)
Requested Procedure Code Sequence	(0032,1064)	(0008,1032)	-	(0008,1032)	(0008,1032)
>Code Value	>(0008,0100)	>(0008,0100)	-	>(0008,0100)	>(0008,0100)
>Coding Scheme Designator	>(0008,0102)	>0008,0102)	-	>(0008,0102)	>(0008,0102)
>Coding Scheme Version	>(0008,0103)	>0008,0103)	-	>(0008,0103)	>(0008,0103)
>Code Meaning	>(0008,0104)	>0008,0104)	-	>(0008,0104)	>(0008,0104)
MPPS SOP Class UID	-	(0000,0002)	(0000,0003)	(0008,1111) >(0008,1150)	(0008,1111) >(0008,1150)
MPPS SOP Instance UID	-	(0000,1000)	(0000,1001)	(0008,1111) >(0008,1155)	(0008,1111) >(0008,1155)

8.1.4. Coerced/Modified fields

When exporting an image the following behavior applies.

A Secondary Capture image shall be exported as reflected in the GUI.

To enable reconstruction, an X-ray image shall be exported without annotations and using the original grayscale values as per acquisition, and a 3D image shall be exported without supplementary rotation.

8.2. Data Dictionary of Private Attributes

Not applicable.

8.3. Coded Terminology and Templates

Not applicable.

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

The high-resolution display monitor attached to the Mobile C-Arm can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

8.5. Standard Extended/Specialized/Private SOPs

The X-Ray Angiographic Image Storage SOP Class is extended to create a standard extended SOP class by addition of standard and private attributes to the created SOP instances as documented in section 9.1.1.3.

8.6. Private Transfer Syntaxes

Not applicable.

9. Annexes of application "ViewForum Surgical Workstation AE"

9.1. IOD Contents

9.1.1. Created SOP Class Instances

This section specifies each created IOD by this application.

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

9.1.1.1. List of created SOP Classes

Table 133: List of created SOP Classes

SOP Class Name	SOP Class UID
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1

9.1.1.2. Secondary Capture Image Storage SOP Class

Table 134: IOD of Created Secondary Capture Image Storage SOP Class Instances

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

	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	CONDITIONAL
	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	Overlay Plane module	CONDITIONAL
	Modality LUT module	CONDITIONAL
	VOI LUT module	CONDITIONAL
	SOP Common Module	ALWAYS

Table 135: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP	AUTO	-
Other Patient Names	0010,1001	PN		ANAP	AUTO	-
Patient ID	0010,0020	LO		VNAP	AUTO, USER	From GUI
Patient's Birth Date	0010,0030	DA		VNAP	AUTO, USER	<yyyymmdd>From GUI
Patient's Birth Time	0010,0032	TM		ANAP	AUTO	<hhmm> From GUI
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	-
Patient's Sex	0010,0040	CS	F, M, O	VNAP	AUTO, USER	-
Ethnic Group	0010,2160	SH		ANAP	AUTO	-
Patient Comments	0010,4000	LT		ANAP	AUTO, USER	From GUI
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO	
> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

Table 136: Patient Medical Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	AUTO, USER	From GUI
Contrast Allergies	0010,2110	LO		ANAP	AUTO, USER	From GUI

Table 137: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		VNAP	AUTO, USER	From GUI
Referring Physician's Name	0008,0090	PN		VNAP	AUTO, USER	From GUI
Study Date	0008,0020	DA		VNAP	AUTO	<yyyymmdd>
Study Description	0008,1030	LO		ANAP	AUTO, USER	From GUI
Study ID	0020,0010	SH		VNAP	MWL	-

Study Instance UID	0020,000D	UI		ALWAYS	AUTO	-
Study Time	0008,0030	TM		VNAP	AUTO	<hhmmss>
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-
>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
>Context Identifier	0008,010F	CS		ANAP	AUTO	-
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Physician(s) of Record	0008,1048	PN		ANAP	AUTO, USER	From GUI
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	AUTO, USER	From GUI
Referenced Patient Sequence	0008,1110	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

Table 138: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Weight	0010,1030	DS		ANAP	AUTO	-
Patient's Age	0010,1010	AS		ANAP	AUTO	From GUI
Patient's Size	0010,1020	DS		ANAP	AUTO	-
Occupation	0010,2180	SH		ANAP	AUTO, USER	From GUI
Additional Patient's History	0010,21B0	LT		ANAP	AUTO, USER	From GUI
Admitting Diagnoses Description	0008,1080	UI		ANAP	AUTO, USER	From GUI
Admitting Diagnoses Code Sequence	0008,1084	SQ		ANAP	AUTO, USER	-
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-
>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
>Context Identifier	0008,010F	CS		ANAP	AUTO	-

Table 139: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Laterality	0020,0060	CS		EMPTY	FIXED	-
Performing Physician's Name	0008,1050	PN		ANAP	AUTO, USER	-
Operator's Name	0008,1070	PN		ANAP	AUTO	-
Protocol Name	0018,1030	LO		ANAP	AUTO, USER	-
Series Date	0008,0021	DA		ANAP	AUTO	-
Series Description	0008,103E	LO		ANAP	AUTO	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Body Part Examined	0018,0015	CS		ANAP	AUTO	-
Patient Position	0018,5100	CS		ANAPCV	AUTO	-
Series Number	0020,0011	IS		VNAP	AUTO	-
Series Time	0008,0031	TM		ANAP	AUTO	-
Referenced Patient Sequence	0008,1111	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ALWAYS	AUTO	-
>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	AUTO	-
>Scheduled Protocol Code Sequence	0040,0008	SQ		ALWAYS	AUTO	-
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-
>>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>> Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
> >Context Identifier	0008,010F	CS		ANAP	AUTO	-
>>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	-
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO, USER	From GUI
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	-
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	-
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	-
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-

>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
>Context Identifier	0008,010F	CS		ANAP	AUTO	-
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO, USER	From GUI
Smallest Pixel Value in Series	0028,0108	SS/ US		ANAP	AUTO	-
Largest Pixel Value in Series	0028,0109	SS/ US		ANAP	AUTO	-

Table 140: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ANAP	CONFIG	-
Manufacturer	0008,0070	LO	Philips Medical Systems	VNAP	AUTO	-
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Station Name	0008,1010	SH		ALWAYS	CONFIG	-
Institutional Department Name	0008,1400	LO		ANAP	AUTO	-
Device Serial Number	0018,1000	LO		ANAP	AUTO	-
Software Versions	0018,1020	LO		ANAP	AUTO	-
Spatial Resolution	0018,1050	DS		ANAP	AUTO	-
Date of Last Calibration	0018,1200	DT		ANAP	AUTO	-
Time of Last Calibration	0018,1201	TM		ANAP	AUTO	-
Pixel Padding Value	0028,0120	SS/ US		ANAP	AUTO	-

Table 141: SC Equipment Module

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

Table 142: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	<yyyymmdd>
Content Time	0008,0033	TM		ALWAYS	AUTO	<hhmmss>
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	-
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Patient Orientation	0020,0020	CS		EMPTY	FIXED	-
Acquisition Date	0008,0023	DA		ANAP	AUTO	-
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	-
Acquisition Time	0008,0032	TM		ANAP	AUTO	-
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	-
>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>Purposed of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	-
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-

>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-
>>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>>Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
>>Context Identifier	0008,010F	CS		ANAP	AUTO	-
>>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	-
Derivation Description	0008,2111	ST		ANAP	AUTO	-
Source Image Sequence	0008,2112	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	-
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	-
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-
>>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>>Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
>>Context Identifier	0008,010F	CS		ANAP	AUTO	-
>>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	-
Derivation Code Sequence	0008,9215	SQ		ANAP	AUTO	-
>Code Meaning	0008,0104	LO		ALWAYS	AUTO	-
>Code Value	0008,0100	SH		ALWAYS	AUTO	-
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	-
>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	-
>Context Group Version	0008,0106	DT		ALWAYS	AUTO	-
>Context Group Local Version	0008,0107	DT		ALWAYS	AUTO	-
>Context Group Extension Flag	0008,010B	CS		ANAP	AUTO	-
>Context Group Extension Creator UID	0008,010D	UI		ALWAYS	AUTO	-
>Context Identifier	0008,010F	CS		ANAP	AUTO	-
Acquisition Number	0020,0012	IS		ANAP	AUTO	-
Instance Number	0020,0013	IS		VNAP	AUTO	-
Patient Orientation	0020,0020	CS		ALWAYS	AUTO	-
Images in Acquisition	0020,1002	IS		ANAP	AUTO	-
image Comments	0020,4000	LT		ANAP	AUTO	-
Quality Control Image	0028,0300	CS		ANAP	AUTO	-
Burned in Annotation	0028,0301	CS		ANAP	AUTO	-
Lossy Image Compression	0028,2110	CS		ANAP	AUTO	-

Lossy Image Compression Ratio	0028,2112	DS		ANAP	AUTO	-
Icon Image Sequence	0088,0200	SQ		ANAP	AUTO	-
>Slice Thickness	0018,0050	DS		ALWAYS	AUTO	-
>Slice Location	0020,1041	DS		ALWAYS AUTO	AUTO	-
>Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	-
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	-

Table 143: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	-
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	-
Planar Configuration	0028,0006	US		ANAP	AUTO	-
Pixel Aspect Ratio	0028,0034	IS		ANAP	AUTO	-
Bits Allocated	0028,0100	US	16	ALWAYS	AUTO	-
Bits Stored	0028,0101	US	12	ALWAYS	AUTO	-
High Bit	0028,0102	US	11	ALWAYS	AUTO	-
Pixel Data	7FE0,0010	OW/ OB		ALWAYS	AUTO	-
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	-
Rows	0028,0010	US	1024	ALWAYS	AUTO	-
Columns	0028,0011	US	1024	ALWAYS	AUTO	-
Smallest Image Pixel Value	0028,0106	SS / US		ANAP	AUTO	-
Largest Image Pixel Value	0028,0107	SS / US		ANAP	AUTO	-
Red Palette Color Lookup Table Descriptor	0028,1101	SS / US		ANAP	AUTO	-
Green Palette Color Lookup Table Descriptor	0028,1102	SS / US		ANAP	AUTO	-
Blue Palette Color Lookup Table Descriptor	0028,1103	SS / US		ANAP	AUTO	-
Red Palette Color Lookup Table Data	0028,1201	OW		ANAP	AUTO	-
Green Palette Color Lookup Table Data	0028,1202	OW		ANAP	AUTO	-
Blue Palette Color Lookup Table Data	0028,1203	OW		ANAP	AUTO	-

Table 144: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DA		ALWAYS	AUTO	-
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	-

Table 145: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	60xx,0010	US		ALWAYS	AUTO	-
Overlay Columns	60xx,0011	US		ALWAYS	AUTO	-
Overlay Description	60xx,0022	LO		ANAP	AUTO	-
Overlay Type	60xx,0040	CS		ALWAYS	AUTO	-
Overlay Subtype	60xx,0045	LO		ANAP	AUTO	-

Overlay Origin	60xx,0050	SS		ALWAYS	AUTO	-
Overlay Bits Allocated	60xx,0100	US		ALWAYS	AUTO	-
Overlay Bits Position	60xx,0102	US		ALWAYS	AUTO	-
ROI Area	60xx,1301	IS		ANAP	AUTO	-
ROI Mean	60xx,1302	DS		ANAP	AUTO	-
ROI Standard Deviation	60xx,1303	DS		ANAP	AUTO	-
Overlay Label	60xx,1500	LO		ANAP	AUTO	-
Overlay Data	60xx,3000	OB / OW		ALWAYS	AUTO	-

Table 146: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality LUT Sequence	0028,3000	SQ		ANAP	AUTO	-
>LUT Descriptor	0028,3002	SS / US		ALWAYS	AUTO	-
>LUT Explanation	0028,3003	LO		ANAP	AUTO	-
>Modality LUT Type	0028,3004	LO		ALWAYS	AUTO	-
>LUT Data	0028,3006	SS / US / OW		ALWAYS	AUTO	-
Rescale Intercept	0028,1052	DS		ANAP	AUTO	-
Rescale Slope	0028,1053	DS		ANAP	AUTO	-

Table 147: VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
VOI LUT Sequence	0028,3010	SQ		ANAP	AUTO	-
>LUT Descriptor	0028,3002	SS / US		ALWAYS	AUTO	-
>LUT Explanation	0028,3003	LO		ANAP	AUTO	-
>LUT Data	0028,3006	SS / US / OW		ALWAYS	AUTO	-
Window Center	0028,1050	DS		ANAP	AUTO	-
Window Width	0028,1051	DS		ANAP	AUTO	-
Window Center & Width Explanation	0028,1055	LO		ANAP	AUTO	-

Table 148: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	Required if expanded/replacement character set used

9.1.1.3. Grayscale Softcopy Presentation State Storage SOP Class

Table 149: IOD of Created 9.1.1.3. Grayscale Softcopy Presentation State Storage SOP Class Instances

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

Table 150: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient ID	0010,0020	LO		VNAP	AUTO, USER	From GUI
Patient's Birth Date	0010,0030	DA		VNAP	AUTO, USER	<yyyymmdd>From GUI
Patient's Birth Time	0010,0032	TM		ANAP	AUTO	<hhmm>From GUI
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	-
Patient's Sex	0010,0040	CS	F, M, O	VNAP	AUTO, USER	-

Table 151: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	COPY	-
Study Time	0008,0030	TM		ALWAYS	COPY	-
Accession Number	0008,0050	SH		VNAP	COPY	-
Referring Physician's Name	0008,0090	PN		VNAP	COPY	-
Study Description	0008,1030	LO		VNAP	COPY	-
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO	-
>Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-
Study Instance UID	0020,000D	UI		ALWAYS, COPY	COPY	-
Study ID	0020,0010	SH		VNAP, COPY	COPY	-

Table 152: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ANAP	AUTO	<yyyymmdd>

Series Time	0008,0031	TM		ANAP, AUTO	AUTO	<hhmm>
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		VNAP	COPY	-
Laterality	0020,0060	CS	L, R	ANAP	COPY	

Table 153: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	-:
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	-
Software Version(s)	0018,1020	LO		ALWAYS	AUTO	-

Table 154: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Displayed Area Selection Sequence	0070,005A	SQ		ALWAYS	AUTO	-
>Displayed Area Top Left Hand Corner	0070,0052	SL	1, 1	ALWAYS	FIXED	-
>Displayed Area Bottom Right Hand Corner	0070,0053	SL		ALWAYS	AUTO	-
>Presentation Size Mode	0070,0100	CS	SCALE TO FIT	ALWAYS	FIXED	-

Table 155: Graphic Layer Module

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

Table 156: Softcopy Presentation LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Sequence	2050,0010	SQ		ALWAYS	AUTO	-
>LUT Descriptor	0028,3002	SS		ALWAYS	AUTO	-
>LUT Data	0028,3006	OW		ALWAYS	AUTO	-

Table 157: Softcopy VOI LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Softcopy VOI LUT Sequence	0028,3110	SQ		ALWAYS	AUTO	-
>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	-
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	-
>Window Center	0028,1050	DS		ANAP	AUTO	-

>Window Width	0028,1051	DS		ANAP	AUTO	-
>Window Center & Width Explanation	0028,1055	DS		ANAPCV	AUTO	-
>VOI LUT Sequence	0028,3010	SQ		ANAP	COPY	-
>>LUT Descriptor	0028,3002	SQ		ALWAYS	COPY	-
>>LUT Explanation	0028,3003	SQ		ANAPCV	COPY	-
>>LUT Data	0028,3006	SQ		ALWAYS	COPY	-

Table 158: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Content Label	0070,0080	CS	“AS LAST SEEN”, ”NEW AT IMPORT”	ALWAYS	AUTO	-
Content Description	0070,0081	LO		VNAP	AUTO	-
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	Current date.
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	Current time.
Content Creator’s Name	0070,0084	PN	“Surgical user”	ALWAYS	AUTO	-

Table 159: Presentation State Relationship Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	-
>Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO	-
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	COPY	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	COPY	-
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-

Table 160: Presentation State Shutter Module

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

Table 161: SOP Commen Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ANAP,	AUTO	-
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.11.1	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-

9.1.2. Usage of Attributes from Received IOD

None specific.

9.1.3. Attribute Mapping

Not applicable.

9.1.4. Coerced/Modified fields

In general, the ViewForum Surgical Workstation AE will try and optimize the imported image data. This may involve the removal of redundant data, either or not due to the creation of a Presentation State object for the image data. This may also involve the creation of extra attributes. As it is not the intention of the ViewForum Surgical Workstation AE to export this data as such, the SOP Instance UID shall not be changed. If not available at import then the ViewForum Surgical Workstation AE will create the additional attributes as listed in the following table.

Table 162: Additional Attributes for Image Storage

Attribute Name	Tag	VR	Generated Value
Performed Procedure Step Start Date	0040,0244	DA	Copied from (0008,0020) Study Date.
Performed Procedure Step Start Time	0040,0245	TM	Copied from (0008,0030) Study Time.
Performed Procedure Step ID	0040,0253	SH	Copied from (0020,0010) Study ID.
Performed Procedure Step Description	0040,0254	LO	Copied from (0008,1030) Study Description.

If the SCU does not propose a presentation context for the Grayscale Softcopy Presentation State storage SOP class, then the ViewForum Surgical Workstation AE will derive Presentation State data from the imported image data and store this data in a new series within the examination of the imported image. However, if during import the image is accompanied by Presentation State data, the ViewForum Surgical Workstation AE database shall avoid data overlap by only storing the relevant data from the first object received; either the first image or its Presentation State!

Thus it will omit data received by succeeding objects concerning the optional attributes (VT=3) listed in the following table, and clear all mandatory attributes (VT=2) listed in the second table below.

Table 163: Omitted Attributes for Optional Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Module					
Referenced Patient Sequence	0008,1120	SQ		ANAP	AUTO
Patient's Birth Date	0010,0032	TM		ANAP	AUTO
Other Patient IDs	0010,1000	LO		ANAP	AUTO
Other Patient Names	0010,1001	PN		ANAP	AUTO
Ethnic Group	0010,2160	SH		ANAP	AUTO
Patient Comments	0010,4000	LT		ANAP	AUTO
General Study Module					
Referring Physician Identification Sequence	0008,0096	SQ		ANAP	AUTO
Study Description	0008,1030	LO		ANAP	AUTO
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO
Physician(s) of Record	0008,1048	PN		ANAP	AUTO
Physician(s) of Record Identification Sequence	0008,1049	SQ			
Name of Physician(s) Reading Study	0008,1060	PN		ANAP	AUTO
Physician(s) Reading Study Identification Sequence	0008,1062	SQ		ANAP	AUTO
Referenced Study Sequence	0008,1110	SQ		ANAP	AUTO
Patient Study Module					
Admitting Diagnoses Description	0008,1080	UI		ANAP	AUTO
Admitting Diagnoses Code Sequence	0008,1084	SQ		ANAP	AUTO
Patient's Age	0010,1010	AQ		ANAP	AUTO
Patient's Size	0010,1020	DS		ANAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Weight	0010,1030	DS		ANAP	AUTO
Occupation	0010,2180	SH		ANAP	AUTO
Additional Patient History	0010,21B0	LT		ANAP	AUTO
Clinical Trial Study Module					
Clinical Trial Time Point Description	0012,0051	DA		ANAP	AUTO
General Series Module					
Series Date	0008,0021	DA		ANAP	AUTO
Series Time	0008,0031	TM		ANAP	AUTO
Series Description	0008,103E	LO		ANAP	AUTO
Performing Physician's Name	0008,1050	PN		ANAP	AUTO
Performing Physician Identification Sequence	0008,1052	SQ		ANAP	AUTO
Operators' Name	0008,1070	PN		ANAP	AUTO
Operators Identification Sequence	0008,1072	SQ		ANAP	AUTO
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO
Body Part Examined	0008,0015	CS		ANAP	AUTO
Protocol Name	0018,1030	LO		ANAP	AUTO
Smallest Pixel Value in Series	0028,0108	US / SS		ANAP	AUTO
Largest Pixel Value in Series	0028,0109	US / SS		ANAP	AUTO
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO
Comments on the Performed Procedure Step	0040,0280	ST		ANAP	AUTO
General Equipment Module					
Institution Name	0008,0080	LO		ANAP	AUTO
Institution Address	0008,0081	ST		ANAP	AUTO
Station Name	0008,1010	SH		ANAP	AUTO
Institutional Department Name	0008,1040	LO		ANAP	AUTO
Manufacturer's Model Name	0008,1090	LO		ANAP	AUTO
Device Serial Number	0018,1000	Lo		ANAP	AUTO
Software Versions	0018,1020	LO		ANAP	AUTO
Spatial Resolution	0018,1050	DS		ANAP	AUTO
Date of Last Calibration	0018,1200	DA		ANAP	AUTO
Time of Last Calibration	0018,1201	TM		ANAP	AUTO
Pixel Padding Value	0028,0120	US / SS		ANAP	AUTO
Display Shutter Module					
Shutter Presentation Value	0018,1622	US		ANAP	AUTO
Overlay Plane Module					
Overlay Description	60xx,0022	LO		ANAP	AUTO
Overlay Subtype	60xx,0045	LO		ANAP	AUTO
ROI Area	60xx,1301	IS		ANAP	AUTO
ROI Mean	60xx,1302	DS		ANAP	AUTO
ROI Standard Deviation	60xx,1303	DS		ANAP	AUTO
Overlay Label	60xx,1500	LO		ANAP	AUTO
SOP Common Module					
Instance Creation Date	0008,0012	DA		ANAP	AUTO
Instance Creation Time	0008,0013	TM		ANAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Creator UID	0008,0014	UI		ANAP	AUTO
Coding Scheme Identification Sequence	0008,0110	SQ		ANAP	AUTO
Timezone Offset From UTC	0008,0201	SH		ANAP	AUTO
Contributing Equipment Sequence	0018,A001	SQ		ANAP	AUTO
Instance Number	0020,0013	IS		ANAP	AUTO
SOP Authorization Date and Time	0100,0420	DT		ANAP	AUTO
SOP Authorization Comment	0100,0424	LT		ANAP	AUTO
Authorization Equipment Certification Number	0100,0426	LO		ANAP	AUTO
MAC Parameters Sequence	4FFE,0001	SQ		ANAP	AUTO
Digital Signatures Sequence	FFFA,FFFA	SQ		ANAP	AUTO

Table 164: Cleared Attributes for Mandatory Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient Module					
Patient's Name	0010,0010	PN		VNAP	AUTO
Patient ID	0010,0020	LO		VNAP	AUTO
Patient's Birth Date	0010,0030	DA		VNAP	AUTO
Patient's Sex	0010,0040	CS		VNAP	AUTO
Clinical Trial Subject Module					
Clinical Trial Protocol	0012,0021	LO		VNAP	AUTO
Clinical Trial Site ID	0012,0030	LO		VNAP	AUTO
Clinical Trial Site Name	0012,0031	LO		VNAP	AUTO
General Study Module					
Study Date	0008,0020	DA		VNAP	AUTO
Study Time	0008,0030	TM		VNAP	AUTO
Accession Number	0008,0050	SH		VNAP	AUTO
Referring Physician's Name	0008,0090	PN		VNAP	AUTO
Study ID	0020,0010	SH		VNAP	AUTO
Clinical Trial Study Module					
Clinical Trial Time Point ID	0012,0050	LO		VNAP	AUTO
General Series Module					
Patient Position	0018,5100	CS		ANAPCV	AUTO
Series Number	0020,0011	IS		VNAP	AUTO
Laterality	0020,0060	CS		ANAPCV	AUTO
Clinical Trial Series Module					
Clinical Trial Coordinating Center Name	0012,0060	LO		VNAP	AUTO
General Equipment Module					
Manufacturer	0008,0070	LO		VNAP	AUTO
Mask Module					
Recommended Viewing Mode	0028,1090	CS		VNAP	AUTO
Overlay/Curve Activation Module					
Curve Activation Layer	50xx,1001	CS		ANAP	AUTO
Overlay Activation Layer	60xx,1001	CS		ANAP	AUTO

The ViewForum Surgical Workstation AE allows the operator (USER) to modify attributes of the stored images in the GUI; see the following table. The ViewForum Surgical Workstation AE does not modify the pixel values of the stored images. Modified images retain their original Study, Series and Image UID.

Table 165: Modifiable Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient					
Patient's Name	0010,0010	PN		VNAP	USER
Patient ID	0010,0050	LO		VNAP	USER
Patient's Birth Date	0010,0030	DA		VNAP	USER
Patient's Sex	0010,0040	CS		VNAP	USER
Medical Alerts	0010,2000	LO	1-N	VNAP	USER
Contrast Allergies	0010,2110	LO	1-N	VNAP	USER
Patient Comments	0010,4000	LT		ANAP	USER
Study					
Accession Number	0008,0050	SH		VNAP	USER
Referring Physician's Name	0008,0090	PN		VNAP	USER
Study Description	0008,1030	LO		ANAP	USER
Physician(s) of Record	0008,1048	PN	1-N	ANAP	USER
Name of Physician(s) Reading Study	0008,1060	PN	1-N	ANAP	USER
Admitting Diagnoses Description	0008,1080	LO	1-N	ANAP	USER
Patient's Age	0010,1010	AS		ANAP	USER
Occupation	0010,2180	SH		ANAP	USER
Additional Patient History	0010,21B0	LT		ANAP	USER
Examination					
Performed Station Name	0040,0242	SH		An institution defined name for the modality on which the Performed Procedure Step was performed.	CONF, MPPS, USER
Performed Location	0040,0243	SH		Description of the location at which the Performed Procedure Step was performed.	MPPS, USER
Performed Procedure Step Description	0040,0254	LO		From Modality Worklist or user input. The user can modify the description provided via Modality Worklist.	MPPS, USER
Performed Procedure Type Description	0040,0255	LO		A description of the type of procedure performed.	MPPS, USER
Comments on the Performed Procedure Step	0040,0280	ST		User-defined comments on the Performed Procedure Step.	MPPS, USER

9.2. Data Dictionary of Private Attributes

Not applicable.

9.3. Coded Terminology and Templates

Not applicable.

9.3.1. Context Groups

Not applicable.

9.3.2. Template Specifications

Not applicable.

9.3.3. Private code definitions

Not applicable.

9.4. Grayscale Image consistency

The high-resolution display monitor attached to the product can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

9.5. Standard Extended/Specialized/Private SOP Classes.

The ViewForum Surgical Workstation AE supports the following standard specialized SOP classes as SCP.

Table 166: Standard Specialized SOP Classes of ViewForum Surgical Workstation AE

SOP Class Name	SOP Class UID
X-Ray Specialization	1.3.46.670589.2.3.1.1
Stack of X-Ray	1.3.46.670589.2.4.1.1
Volume	1.3.46.670589.5.0.1.1
3D Volume Object	1.3.46.670589.5.0.2.1
Surface	1.3.46.670589.5.0.3.1
Cardio	1.3.46.670589.5.0.8.1
CT Synthetic Image	1.3.46.670589.5.0.9
MR Synthetic Image	1.3.46.670589.5.0.10
MR Cardio Analysis	1.3.46.670589.5.0.11.1
CX Synthetic Image	1.3.46.670589.5.0.12
Perfusion	1.3.46.670589.5.0.13
Perfusion Analysis	1.3.46.670589.5.0.14

Table 167: List of created SOP Classes

SOP Class Name	SOP Class UID
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1

9.5.1. Standard Extended/Specialized/Private SOP Classes.

9.5.1.1. Secondary Capture Image Storage SOP Class

Table 168: Addition of standard and private attributes for Secondary Capture Image Storage SOP Class Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Medical Alerts	0010,2000	LO		ANAP	AUTO, USER	Patient Medical Module. From GUI.
Allergies	0010,2110	LO		ANAP	AUTO, USER	Patient Medical Module. From GUI.

9.6. Private Transfer Syntaxes

Not applicable.

10. Annexes of application "3D-RX Workstation AE"

10.1. IOD Contents

10.1.1. Created SOP Instances

This section specifies each created IOD by this application.

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

10.1.1.1. List of created SOP Classes

Table 169: List of created SOP Classes

SOP Class Name	SOP Class UID
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7

10.1.1.2. CT Image Storage SOP Class

Table 170: 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	General Image Module	ALWAYS
	Image Plane Module	ALWAYS
	Image Pixel Module	ALWAYS
	Contrast/Bolus Module	ALWAYS
	CT Image Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 171: Patient Module

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

Table 172: General Study Module

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

Table 173: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	XA	ALWAYS	AUTO	-
Patient Position	0018,5100	CS		VNAP	AUTO	-
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO	-
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	-
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	-
Performing Physician's Name	0008,1050	PN		VNAP	COPY	-
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	-
>Requested Procedure ID	0040,1001	SH	3DRAAcquisition	ALWAYS	AUTO	-
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	-
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	-

Table 174: 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 175: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		VNAP	AUTO	-
Manufacturer	0008,0070	LO	Philips Medical Systems (Netherlands)	ALWAYS	FIXED	-
Manufacturer's Model Name	0008,1090	LO	XtraVision	ALWAYS	CONFIG	-
Software Version(s)	0018,1020	LO	R_7.2	ALWAYS	CONFIG	-
Station Name	0008,1010	SH		ALWAYS	CONFIG	-

Table 176: General Image Module

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

Table 177: Image Plane Module

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

Table 178: Image Pixel Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Columns	0028,0011	US	256	ALWAYS	AUTO	-
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	-
Pixel Representation	0028,0103	US	0	ALWAYS	AUTO	-
Rows	0028,0010	US	256	ALWAYS	AUTO	-

Table 179: Contrast/Bolus Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contrast/Bolus Agent	0018,0010	LO		VNAP	AUTO	-

Table 180: CT Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	FIXED	-
KVP	0018,0060	DS		VNAP	AUTO	-
Acquisition Number	0020,0012	IS		ALWAYS	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	-
Rescale Intercept	0028,1052	DS		ALWAYS	AUTO	-
Rescale Slope	0028,1053	DS		ALWAYS	AUTO	-

Table 181: VOI LUT Module

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

Table 182: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.2	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Specific Character Set	0008,0005	CS	Value 1: ISO_IR 100	ALWAYS	AUTO	-

10.1.1.3. SC Image Storage SOP Class

Table 183: IOD of Created SC Image Storage SOP Class Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
	SC Equipment module	ALWAYS
Image	General Image Module	ALWAYS
	Image Pixel Module	ALWAYS
	SC Image Module	ALWAYS
	VOI LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Table 184: Patient Module

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

Table 185: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Accession Number	0008,0050	SH		ALWAYS	COPY	-
Referring Physician's Name	0008,0090	PN		VNAP	COPY	-
Study Date	0008,0020	DA		ALWAYS	AUTO	-

Study ID	0020,0010	SH		ALWAYS	AUTO	-
Study Instance UID	0020,000D	UI		ALWAYS	COPY	-
Study Time	0008,0030	TM		ALWAYS	AUTO	-

Table 186: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient Position	0018,5100	CS		ANAP	AUTO	-
Performed Procedure Step Description	0040,0254	LO		ANAP	AUTO	-
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	-
Performed Procedure Step Start Date	0040,0244	DA		ANAP	AUTO	-
Performed Procedure Step Start Time	0040,0245	TM		ANAP	AUTO	-
Performing Physician's Name	0008,1050	PN		VNAP	COPY	-
Series Date	0008,0021	DA		ALWAYS	AUTO	-
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	-
Series Number	0020,0011	IS		ALWAYS	AUTO	-
Series Time	0008,0031	TM		ALWAYS	AUTO	-
Request Attributes Sequence	0040,0275	SQ		ANAP	AUTO	-
>Requested Procedure ID	0040,1001	SH		ALWAYS	AUTO	-
>Scheduled Procedure Step Description	0040,0007	LO		ANAP	AUTO	-
> Scheduled Protocol Code Sequence	0040,0008	SQ		ANAP	AUTO	-
>> Code Value	0008,0100	SH		ALWAYS	AUTO	-
>> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	-
>> Coding Scheme Version	0008,0103	SH		ANAP	AUTO	-
>> Code Meaning	0008,0104	SH		ALWAYS	AUTO	-
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	AUTO	-
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	AUTO	-
> Referenced SOP Class UID	0008,1150	UI	1.2.840.10008.3.1.2.3.3	ALWAYS	AUTO	-
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	-

Table 187: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Institution Name	0008,0080	LO		ALWAYS	CONFIG	-
Manufacturer	0008,0070	LO	Philips Medical Systems (Netherlands)	ALWAYS	FIXED	-
Manufacturer's Model Name	0008,1090	LO	XtraVision	ALWAYS	CONFIG	-
Software Version(s)	0018,1020	LO	R_7.2	ALWAYS	CONFIG	-
Station Name	0008,1010	SH		ALWAYS	CONFIG	-

Table 188: SC Equipment Module

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

Table 189: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	-
Image Type	0008,0008	CS	DERIVED, SECONDARY	ALWAYS	FIXED	-
Patient Orientation	0020,0020	CS		EMPTY	FIXED	-

Table 190: 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	-
Rows	0028,0010	US		ALWAYS	FIXED	-
Columns	0028,0011	US		ALWAYS	FIXED	-
Bits Allocated	0028.0100	US	8			
Bits Stored	0028.0101	US	8			
High Bit	0028.0102	US	7			
Pixel Representation	0028,0103	US	0	ALWAYS	FIXED	-
Pixel Data	7FE0,0010	OW/ OB		ALWAYS	AUTO	-

Table 191: SC Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Date of Secondary Capture	0018,1012	DT		ALWAYS	AUTO	-
Time of Secondary Capture	0018,1014	TM		ALWAYS	AUTO	-

Table 192: VOI LUT Module

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

Table 193: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.7	ALWAYS	AUTO	-
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	-
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	-

10.1.2. Usage of Attributes from Received IOD's.

Not applicable.

10.1.3. Attribute Mapping

The following mapping applies for attributes of the 3D-RX Workstation AE SOP Classes.

Table 194: Attribute Mapping of the 3D-RX Workstation AE SOP Classes.

Attribute Name	Mobile C-Arm AE	SC Tag	CT Tag
Accession Number	0008,0050	0008,0050	0008,0050
Referring Physician's Name	0008,0090	0008,0090	0008,0090
Patient's Name	0010,0010	0010,0010	0010,0010
Patient ID	0010,0020	0010,0020	0010,0020
Patient's Birth Date	0010,0030	0010,0030	0010,0030
Patient's Sex	0010,0040	0010,0040	0010,0040
Study Instance UID	0020,000D	0020,000D	0020,000D
Performing Physician's Name	0008,1050	0008,1050	0008,1050

10.1.4. Coerced/Modified fields

Not applicable.

10.2. Data Dictionary of Private Attributes

Not applicable.

10.3. Coded Terminology and Templates

Not applicable.

10.3.1. Context Groups

Not applicable.

10.3.2. Template Specifications

Not applicable.

10.3.3. Private code definitions

Not applicable.

10.4. Grayscale Image consistency

Not applicable.

10.5. Standard Extended/Specialized/Private SOPs

The CT Image Storage SOP Class is a standard specialized SOP class as specified in section 10.1.1.2.

10.6. Private Transfer Syntaxes

Not applicable.