

# DICOM Conformance Statement

BV Endura R2.3,  
BV Pulsera R2.3,  
Veradius R1.1.



**Issued by:**

Philips Healthcare Philips Nederlands Best

P.O. Box 10.000  
5680 DA Best  
The Netherlands

Email: [dicom@philips.com](mailto:dicom@philips.com)

Internet: <http://www.medical.philips.com/connectivity>

Document Number: 8026939

Date: 17-July-2013

## 1. DICOM Conformance Statement Overview

This DICOM Conformance Statement is applicable to BV Endura and BV Pulsera with software release 2.5 and to Veradius with software release 3.4.

BV Endura R2.3, BV Pulsera R2.3 and Veradius R1.1 are surgery mobile C-arm X-ray image generation systems, 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 surgical 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.

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

- Print images from the local database on a DICOM printer (Standard DICOM package).
- Export images from the local database to a remote database (Standard DICOM package).
- Creates and Sends Radiation Dose Structure Reports (RDSRs).
- Automatically send a storage commitment request (Advanced DICOM package).
- Query an information system for a modality worklist (Advanced DICOM package).
- Send Modality Performed Procedure Step details to an information system (Advanced DICOM package).
- Query and retrieve images from a remote database (ViewForum Surgical Workstation).
- Read and Write DICOM media (ViewForum Surgical Workstation).
- Export CT Images and Secondary Captures (3D-RX Surgical Workstation).

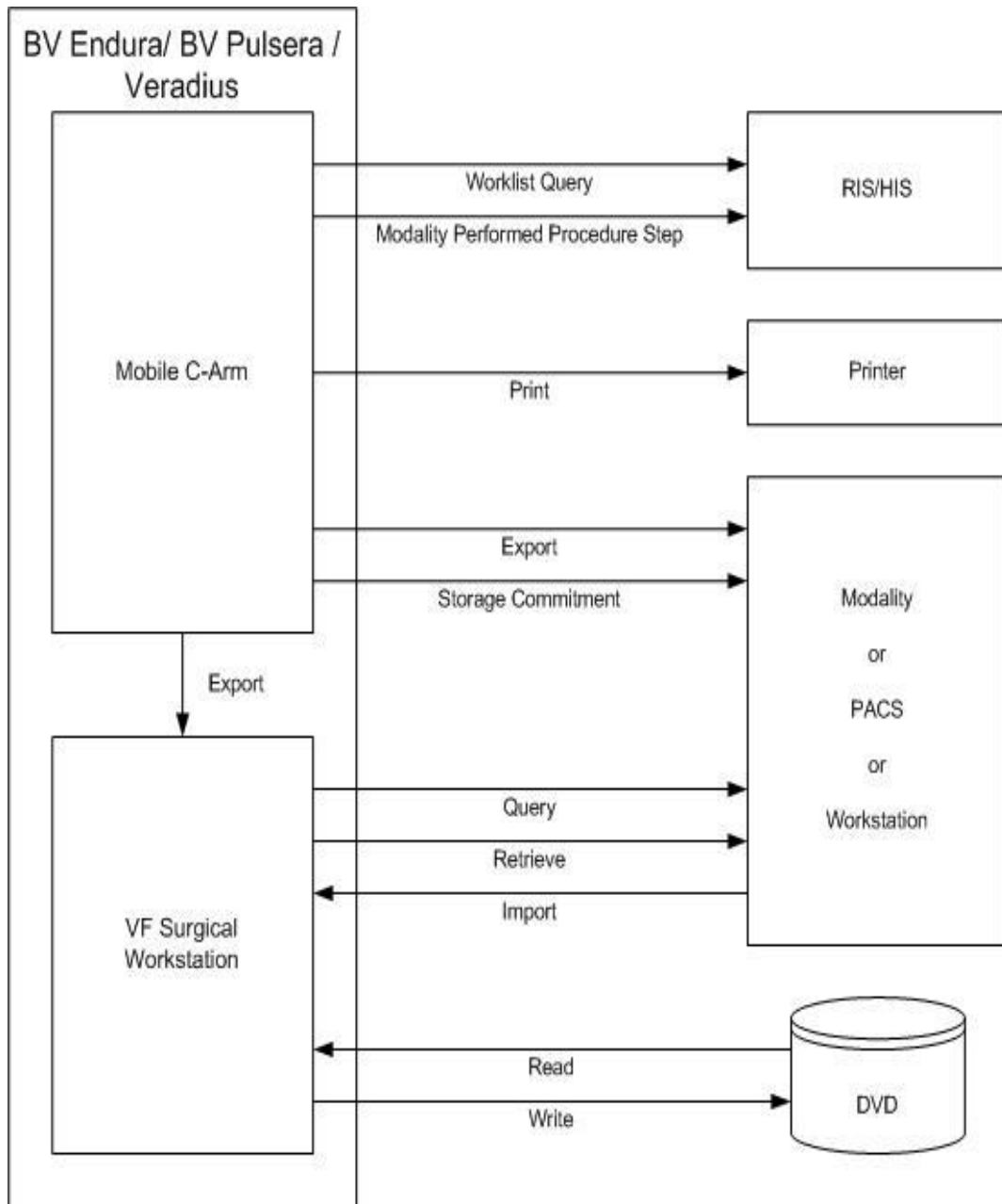


Figure 1: System Overview of Mobile C-Arm with integrated ViewForum Surgical Workstation

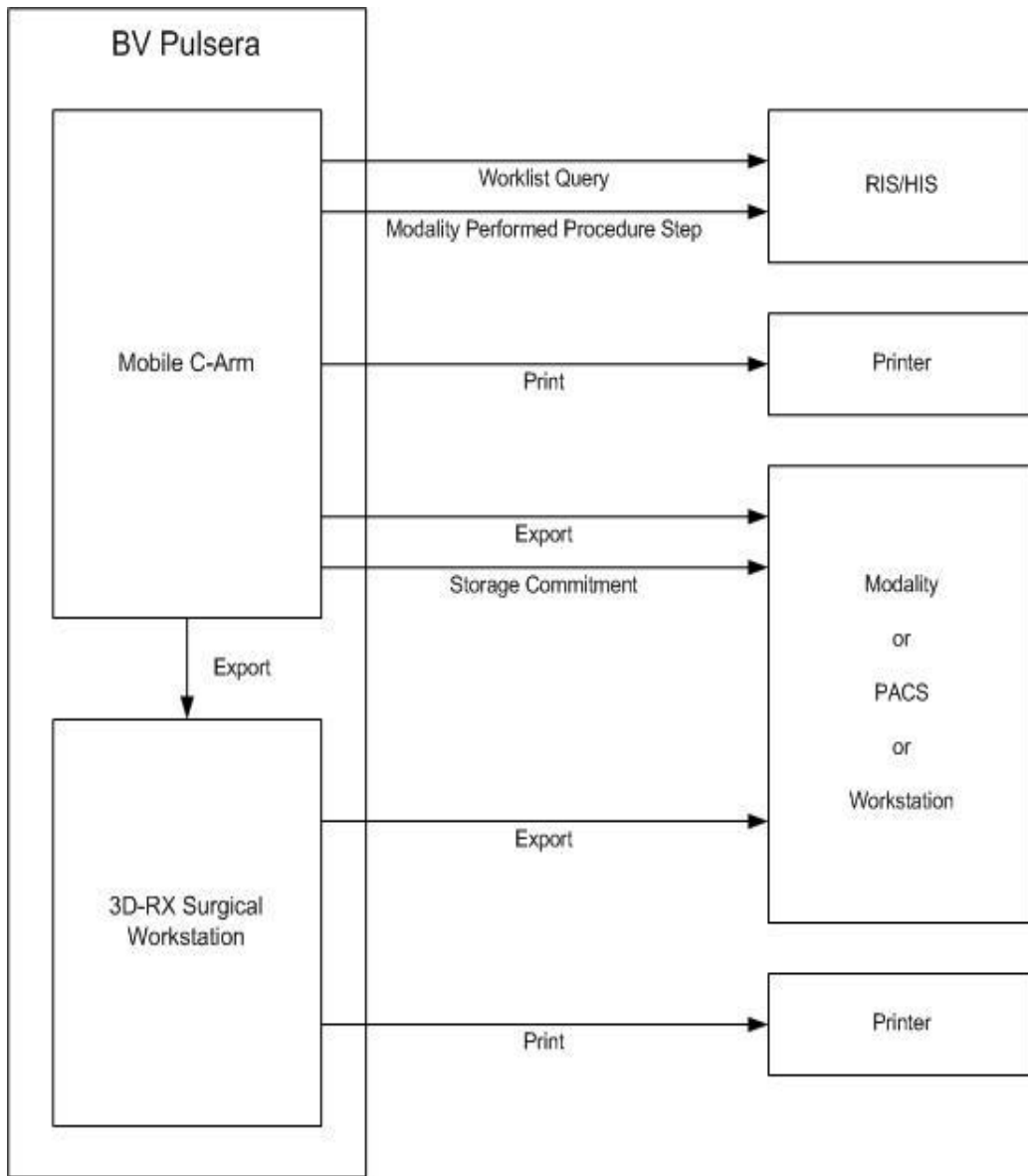


Figure 2: System Overview of Mobile C-Arm with integrated 3D-RX Surgical Workstation.

The following table 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		
<b>Other</b>			
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes
<b>Print Management</b>			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No

SOP Class		User of Service (SCU)	Provider of Service (SCP)
Name	UID		
<b>Query/Retrieve</b>			
Patient Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.1.1	Yes	No
Study Root QR Information Model - FIND SOP Class	1.2.840.10008.5.1.4.1.2.2.1	Yes	No
PatientStudy Only QR Info. Model - FIND SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.1	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 - MOVE SOP Class	1.2.840.10008.5.1.4.1.2.2.2	Yes	No
PatientStudy Only QR Info. Model - MOVE SOP Class (Retired)	1.2.840.10008.5.1.4.1.2.3.2	Yes	No
<b>Transfer</b>			
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No
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 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
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	No	Yes
Philips Private Reconstructed X-ray Storage	1.3.46.670589.2.4.1.1	No	Yes
Philips Private ViewForum 3D Volume New Storage	1.3.46.670589.5.0.1.1	No	Yes
Philips Private ViewForum MR Synthetic Image Storage	1.3.46.670589.5.0.10	No	Yes
Philips Private ViewForum MR Cardio Analysis New Storage	1.3.46.670589.5.0.11.1	No	Yes
Philips Private ViewForum CX Synthetic Image Storage	1.3.46.670589.5.0.12	No	Yes
Philips Private ViewForum Perfusion Storage	1.3.46.670589.5.0.13	No	Yes
Philips Private ViewForum Perfusion Analysis Storage	1.3.46.670589.5.0.14	No	Yes
Philips Private ViewForum 3D Volume Object New Storage	1.3.46.670589.5.0.2.1	No	Yes
Philips Private ViewForum Surface New Storage	1.3.46.670589.5.0.3.1	No	Yes
Philips Private ViewForum MR Cardio New Storage	1.3.46.670589.5.0.8.1	No	Yes
Philips Private ViewForum CT Synthetic Image Storage	1.3.46.670589.5.0.9	No	Yes
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No
<b>Workflow Management</b>			
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	Yes	No
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Yes	No
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Yes	No

The Transfer SCU (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 but 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 Surgical Workstation includes dedicated Transfer SCU (CT and Secondary Capture Image Storage) and Print Management SCU services.

The following table provides an overview of all media services as provided by the BV Family.

**Note:** After data is written to DVD, the DVD is finalized; the finalized DVD can now be read on almost every DVD reader. Currently the BV Family 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 is the Media DVD-R/-RW.

Media services are provided only when ViewForum Workstation or 3D-RX Workstation options are present.

**Table 2: Media Services**

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

## 2. Table of Contents

<b>1.</b>	<b>DICOM CONFORMANCE STATEMENT OVERVIEW .....</b>	<b>3</b>
<b>2.</b>	<b>TABLE OF CONTENTS .....</b>	<b>8</b>
<b>3.</b>	<b>INTRODUCTION .....</b>	<b>12</b>
<b>3.1.</b>	<b>REVISION HISTORY .....</b>	<b>12</b>
<b>3.2.</b>	<b>AUDIENCE .....</b>	<b>12</b>
<b>3.3.</b>	<b>REMARKS .....</b>	<b>12</b>
<b>3.4.</b>	<b>DEFINITIONS, TERMS AND ABBREVIATIONS.....</b>	<b>13</b>
<b>3.5.</b>	<b>REFERENCES.....</b>	<b>14</b>
<b>4.</b>	<b>NETWORKING .....</b>	<b>15</b>
<b>4.1.</b>	<b>IMPLEMENTATION MODEL .....</b>	<b>15</b>
4.1.1.	Application Data Flow .....	15
4.1.2.	Functional Definition of AE's .....	17
4.1.2.1.	Functional Definition of 3D-RX Surgical Workstation AE .....	17
4.1.2.2.	Functional Definition of Mobile C-Arm AE .....	18
4.1.2.3.	Functional Definition of ViewForum Surgical Workstation AE .....	18
4.1.3.	Sequencing of Real World Activities .....	18
<b>4.2.</b>	<b>AE SPECIFICATIONS .....</b>	<b>22</b>
4.2.1.	3D-RX Surgical Workstation AE .....	22
4.2.1.1.	SOP Classes .....	22
4.2.1.2.	Association Policies.....	22
4.2.1.2.1.	General.....	22
4.2.1.2.2.	Number of Associations .....	22
4.2.1.2.3.	Asynchronous Nature .....	23
4.2.1.2.4.	Implementation Identifying Information .....	23
4.2.1.2.5.	Communication Failure Handling .....	23
4.2.1.3.	Association Initiation Policy .....	23
4.2.1.3.1.	(Real-World) Activity – Verification as SCU .....	24
4.2.1.3.2.	(Real-World) Activity – Image Export .....	25
4.2.1.3.3.	(Real-World) Activity – Print Management as SCU .....	27
4.2.1.4.	Association Acceptance Policy.....	33
4.2.2.	Mobile C-Arm AE .....	34
4.2.2.1.	SOP Classes .....	34
4.2.2.2.	Association Policies.....	34
4.2.2.2.1.	General.....	34
4.2.2.2.2.	Number of Associations .....	34
4.2.2.2.3.	Asynchronous Nature .....	35
4.2.2.2.4.	Implementation Identifying Information .....	35
4.2.2.2.5.	Communication Failure Handling .....	35
4.2.2.3.	Association Initiation Policy .....	35
4.2.2.3.1.	(Real-World) Activity – Verification as SCU .....	35
4.2.2.3.2.	(Real-World) Activity – Modality worklist as SCU .....	37
4.2.2.3.3.	(Real-World) Activity – Modality Performed Procedure Step as SCU .....	41
4.2.2.3.4.	(Real-World) Activity – Instance Export.....	46
4.2.2.3.5.	(Real-World) Activity – Storage Commitment Push Model as SCU .....	47
4.2.2.3.6.	(Real-World) Activity – Print Management as SCU .....	49
4.2.2.4.	Association Acceptance Policy.....	56
4.2.3.	ViewForum Surgical Workstation AE .....	57
4.2.3.1.	SOP Classes .....	57
4.2.3.2.	Association Policies.....	57
4.2.3.2.1.	General.....	57
4.2.3.2.2.	Number of Associations .....	58
4.2.3.2.3.	Asynchronous Nature .....	58



4.2.3.2.4.	Implementation Identifying Information .....	58
4.2.3.2.5.	Communication Failure Handling .....	58
4.2.3.3.	Association Initiation Policy .....	58
4.2.3.3.1.	(Real-World) Activity – FIND as SCU .....	59
4.2.3.3.2.	(Real-World) Activity – MOVE as SCU .....	63
4.2.3.4.	Association Acceptance Policy .....	67
4.2.3.4.1.	(Real-World) Activity – Verification as SCP .....	67
4.2.3.4.2.	(Real-World) Activity – Image Import .....	68
<b>4.3.</b>	<b>NETWORK INTERFACES .....</b>	<b>72</b>
4.3.1.	Physical Network Interfaces .....	72
4.3.2.	Additional Protocols .....	72
<b>4.4.</b>	<b>CONFIGURATION .....</b>	<b>72</b>
4.4.1.	AE Title/Presentation Address Mapping .....	72
4.4.1.1.	Local AE Titles .....	72
4.4.1.2.	Remote AE Title/Presentation Address Mapping .....	72
4.4.2.	Parameters .....	73
<b>5.</b>	<b>MEDIA INTERCHANGE .....</b>	<b>77</b>
<b>5.1.</b>	<b>IMPLEMENTATION MODEL .....</b>	<b>77</b>
5.1.1.	Application Data Flow Diagram .....	77
5.1.2.	Functional Definitions of AE's .....	79
5.1.3.	Sequencing of Real World Activities .....	79
<b>5.2.</b>	<b>AE SPECIFICATIONS .....</b>	<b>80</b>
5.2.1.	ViewForum Surgical Workstation AE Media - Specification .....	80
5.2.1.1.	File Meta Information for the ViewForum Surgical Workstation AE .....	81
5.2.1.2.	Real-World Activities .....	81
5.2.1.2.1.	RWA - Read File-set .....	81
5.2.1.2.2.	RWA - Create File-set .....	81
5.2.1.2.3.	RWA - Update File-set .....	82
5.2.2.	3D-RX Surgical Workstation AE Media - Specification .....	83
5.2.2.1.	File Meta Information for the 3D-RX Surgical Workstation AE .....	83
5.2.2.2.	Real-World Activities .....	83
5.2.2.2.1.	RWA - Create File-set .....	83
<b>5.3.</b>	<b>AUGMENTED AND PRIVATE APPLICATION PROFILES .....</b>	<b>84</b>
5.3.1.	Augmented Application Profiles .....	84
5.3.1.1.	Augmented Application Profile AUG-GEN-DVD-JPEG .....	84
5.3.1.1.1.	SOP Class Augmentations .....	84
5.3.1.1.2.	Directory Augmentations .....	84
5.3.1.1.3.	Other Augmentations .....	84
5.3.2.	Private Application Profiles .....	84
<b>5.4.</b>	<b>MEDIA CONFIGURATION .....</b>	<b>85</b>
<b>6.</b>	<b>SUPPORT OF CHARACTER SETS .....</b>	<b>86</b>
<b>7.</b>	<b>SECURITY .....</b>	<b>87</b>
<b>7.1.</b>	<b>SECURITY PROFILES .....</b>	<b>87</b>
7.1.1.	Security use Profiles .....	87
7.1.2.	Security Transport Connection Profiles .....	87
7.1.3.	Digital Signature Profiles .....	87
7.1.4.	Media Storage Security Profiles .....	87
7.1.5.	Attribute Confidentiality Profiles .....	87
7.1.6.	Network Address Management Profiles .....	89
7.1.7.	Time Synchronization Profiles .....	89
7.1.8.	Application Configuration Management Profiles .....	89
7.1.9.	Audit Trail Profiles .....	89
<b>7.2.</b>	<b>ASSOCIATION LEVEL SECURITY .....</b>	<b>89</b>
<b>7.3.</b>	<b>APPLICATION LEVEL SECURITY .....</b>	<b>89</b>
<b>8.</b>	<b>ANNEXES OF APPLICATION "3D-RX SURGICAL WORKSTATION AE" .....</b>	<b>90</b>

<b>8.1.</b>	<b>IOD CONTENTS</b> .....	<b>90</b>
8.1.1.	Created SOP Instance .....	90
8.1.1.1.	List of created SOP Classes .....	90
8.1.1.2.	CT Image Storage SOP Class.....	90
8.1.1.3.	Secondary Capture Image Storage SOP Class .....	93
8.1.2.	Usage of Attributes from Received IOD .....	95
8.1.3.	Attribute Mapping .....	95
8.1.4.	Coerced/Modified fields .....	96
<b>8.2.</b>	<b>DATA DICTIONARY OF PRIVATE ATTRIBUTES</b> .....	<b>96</b>
<b>8.3.</b>	<b>CODED TERMINOLOGY AND TEMPLATES</b> .....	<b>96</b>
8.3.1.	Context Groups .....	96
8.3.2.	Template Specifications.....	96
8.3.3.	Private code definitions.....	96
<b>8.4.</b>	<b>GRAYSCALE IMAGE CONSISTENCY</b> .....	<b>96</b>
<b>8.5.</b>	<b>STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS</b> .....	<b>96</b>
<b>8.6.</b>	<b>PRIVATE TRANSFER SYNTAXES</b> .....	<b>96</b>
<b>9.</b>	<b>ANNEXES OF APPLICATION "MOBILE C-ARM AE"</b> .....	<b>97</b>
<b>9.1.</b>	<b>IOD CONTENTS</b> .....	<b>97</b>
9.1.1.	Created SOP Instance .....	97
9.1.1.1.	List of created SOP Classes .....	97
9.1.1.2.	Secondary Capture Image Storage SOP Class .....	97
9.1.1.3.	X-Ray Angiographic Image Storage SOP Class .....	101
9.1.1.4.	X-Ray Radiation Dose SR.....	105
9.1.2.	Usage of Attributes from Received IOD .....	108
9.1.3.	Attribute Mapping .....	108
9.1.4.	Coerced/Modified fields .....	110
<b>9.2.</b>	<b>DATA DICTIONARY OF PRIVATE ATTRIBUTES</b> .....	<b>110</b>
<b>9.3.</b>	<b>CODED TERMINOLOGY AND TEMPLATES</b> .....	<b>110</b>
9.3.1.	Context Groups .....	110
9.3.2.	Template Specifications.....	110
9.3.3.	Private code definitions.....	110
<b>9.4.</b>	<b>GRAYSCALE IMAGE CONSISTENCY</b> .....	<b>110</b>
<b>9.5.</b>	<b>STRUCTURED REPORT DOCUMENT INFORMATIONS</b> .....	<b>111</b>
9.5.1.	Radiation Dose Structured Report .....	111
9.5.1.1.	TID 10001 Projection X-Ray Radiation Dose .....	111
9.5.1.2.	TID 10002 Accumulated X-Ray Dose.....	111
9.5.1.3.	TID 10003 Irradiation Event X-Ray Data .....	112
9.5.1.4.	TID 10004 Accumulated Projection X-Ray Dose.....	113
9.5.1.5.	TID 1002 Observer Context.....	113
9.5.1.6.	TID 1004 Device Observer Identifying Attributes .....	113
9.5.1.7.	TID 1020 Person Participant .....	114
9.5.1.8.	TID 1021 Device Participant.....	114
<b>9.6.</b>	<b>PRIVATE TRANSFER SYNTAXES</b> .....	<b>114</b>
<b>10.</b>	<b>ANNEXES OF APPLICATION "VIEWFORUM SURGICAL WORKSTATION AE"</b> .....	<b>115</b>
<b>10.1.</b>	<b>IOD CONTENTS</b> .....	<b>115</b>
10.1.1.	Created SOP Instance.....	115
10.1.1.1.	List of created SOP Classes .....	115
10.1.1.2.	Secondary Capture Image Storage SOP Class .....	115
10.1.1.3.	Grayscale Softcopy Presentation State Storage SOP Class .....	122
10.1.2.	Usage of Attributes from Received IOD .....	125
10.1.3.	Attribute Mapping .....	125
10.1.4.	Coerced/Modified fields .....	125
<b>10.2.</b>	<b>DATA DICTIONARY OF PRIVATE ATTRIBUTES</b> .....	<b>129</b>
<b>10.3.</b>	<b>CODED TERMINOLOGY AND TEMPLATES</b> .....	<b>129</b>
10.3.1.	Context Groups .....	129

10.3.2.	Template Specifications .....	129
10.3.3.	Private code definitions .....	129
<b>10.4.</b>	<b>GRAYSCALE IMAGE CONSISTENCY .....</b>	<b>129</b>
<b>10.5.</b>	<b>STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS.....</b>	<b>129</b>
10.5.1.	Standard Extended/Specialized/Private SOP Instance .....	130
10.5.1.1.	Secondary Capture Image Storage SOP Class .....	130
<b>10.6.</b>	<b>PRIVATE TRANSFER SYNTAXES.....</b>	<b>130</b>

## 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	24-October-2011	Proposal	Updated after review.
01	25-November-2011	Proposal	Updated after review.
02	30-January-2012	Proposal	Updated after IO validation.
03	06-March-2012	Final	Updated document number in line with Document Repository (Live Link).
04	17-July-2013	Final	Updated with configuration information for configurable DICOM attributes

### 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
- Application specialists and sales

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

### 3.3. Remarks

The DICOM Conformance Statement is contained in chapter 4 through 8 and follows the contents and structuring requirements of DICOM PS 3.2.

This DICOM Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**  
Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.  
It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.
- **Validation**  
Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.  
Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.
- **New versions of the DICOM Standard**  
The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM

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

### 3.4. Definitions, Terms and Abbreviations

**Table 4: Definitions, Terms and Abbreviations**

Abbreviations/ Terms	Explanation
AE	Application Entity
AP	Application Profile
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
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
MOD	Magneto-Optical Disk
MPPS	Modality Performed Procedure Step
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDU	Protocol Data Unit
RDSR	Radiation Dose Structure Report
RF	X-Ray Radiofluoroscopic
RIS	Radiology Information System
RT	Radiotherapy
RWA	Real-World Activity
SC	Secondary Capture
SCM	Study Component Management
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
SR	Structure Report(s)
TCP/IP	Transmission Control Protocol/ Internet Protocol
UID	Unique Identifier

Abbreviations/ Terms	Explanation
US	Ultrasound
SR	Structure Report(s)
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 2011) 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 Surgical 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 send 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 sends a Storage Commitment request for those images. When the examination is closed, (optionally) an RDSR is automatically generated (Export).

In service mode the service operator can verify application level communication. (Check)

The **ViewForum Surgical Workstation AE** is intended to view images. Those images may be exported 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 Surgical 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, acquired images and dose reports 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.

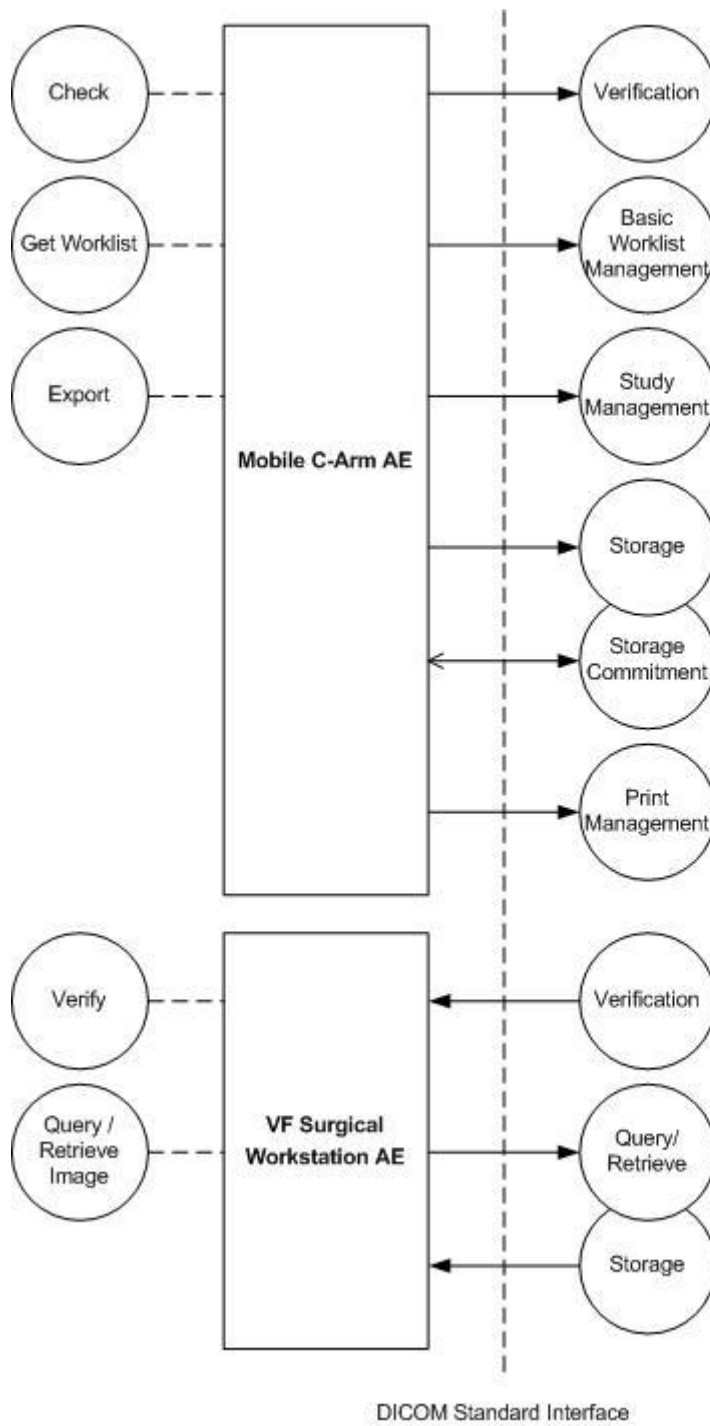


Figure 3: Application Data Flow Diagram Mobile C-Arm AE with integrated ViewForum Workstation AE



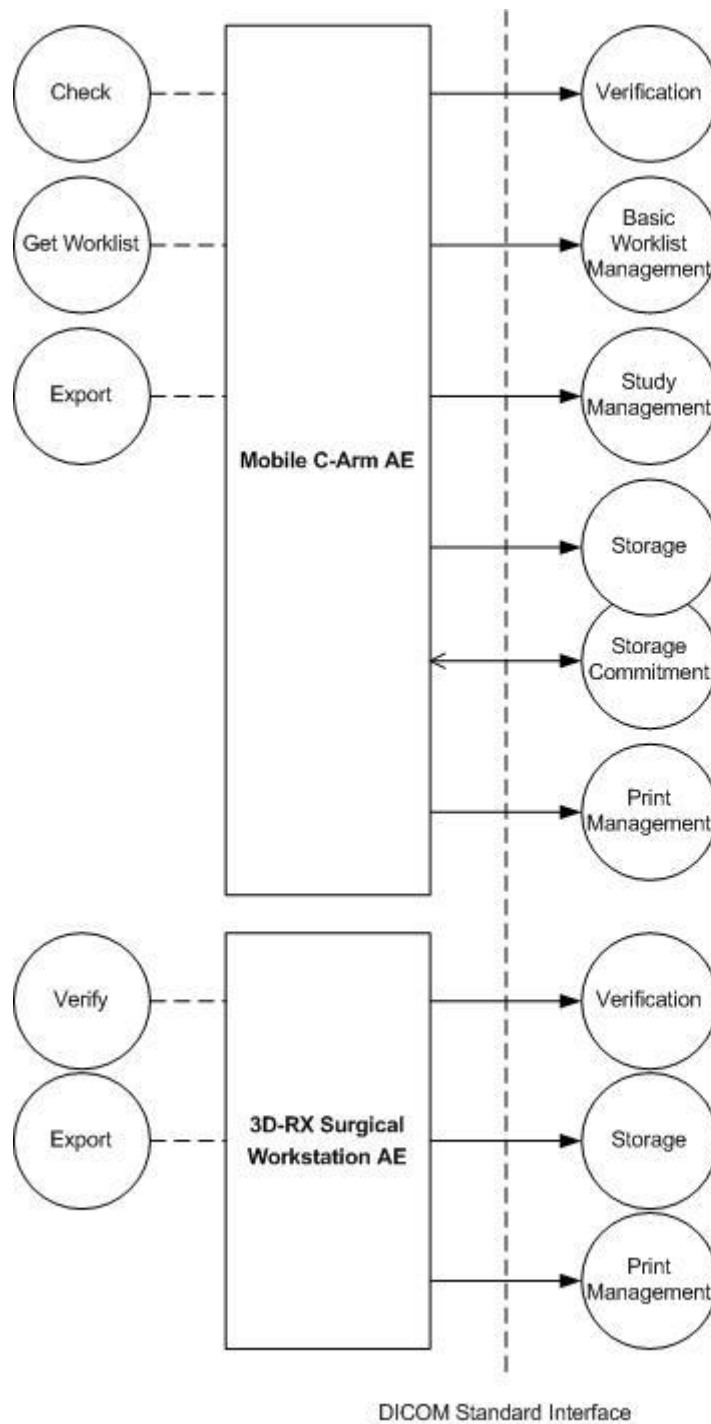


Figure 4: Application Data Flow Diagram Mobile C-Arm AE with integrated 3D-RX Surgical Workstation AE

## 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 3D-RX Surgical Workstation AE

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

#### **4.1.2.2. 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).

#### **4.1.2.3. 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).

#### **4.1.3. Sequencing of Real World Activities**

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

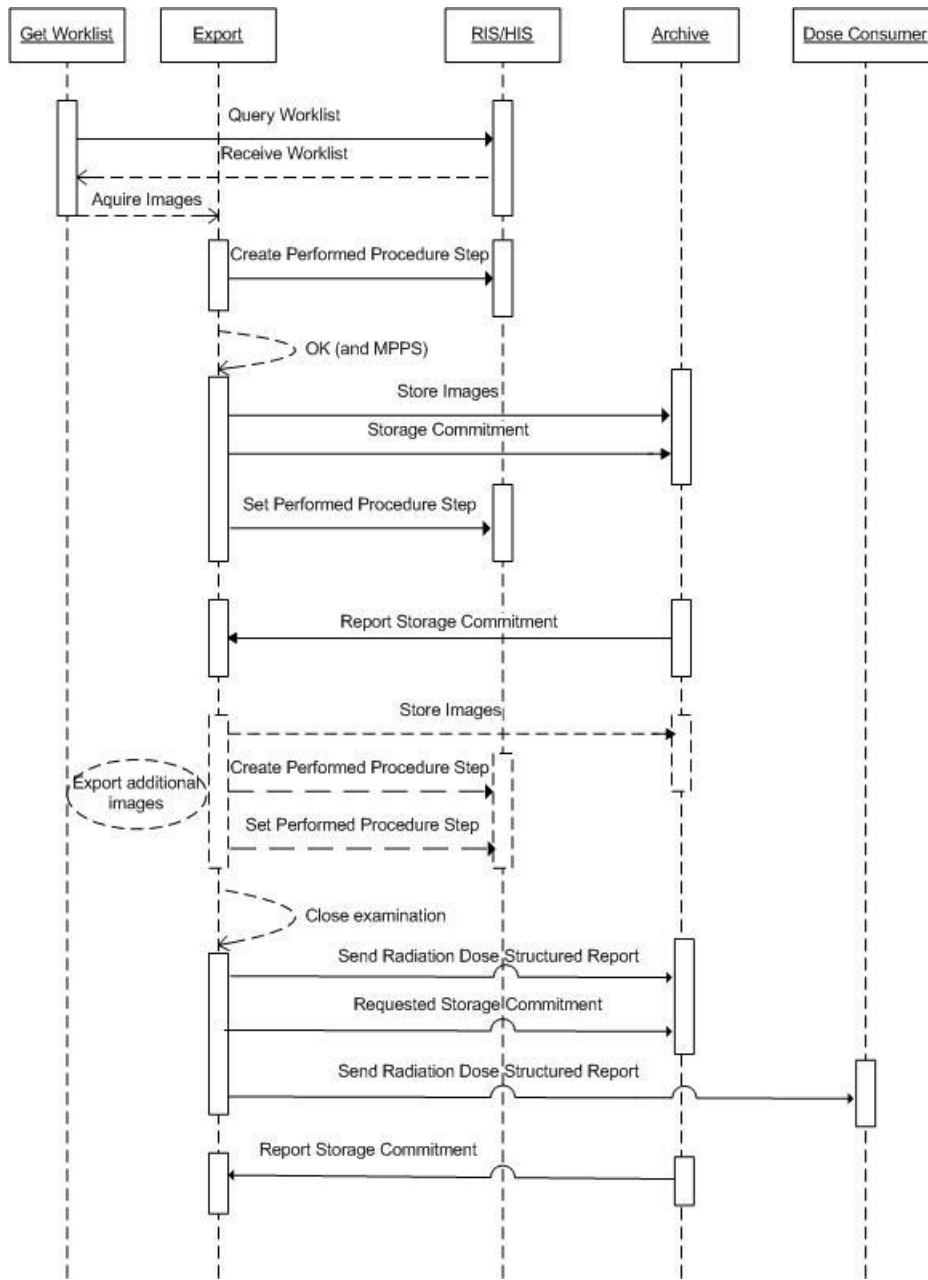


Figure 5: Typical Acquisition Archive Storage Sequencing Constraint.

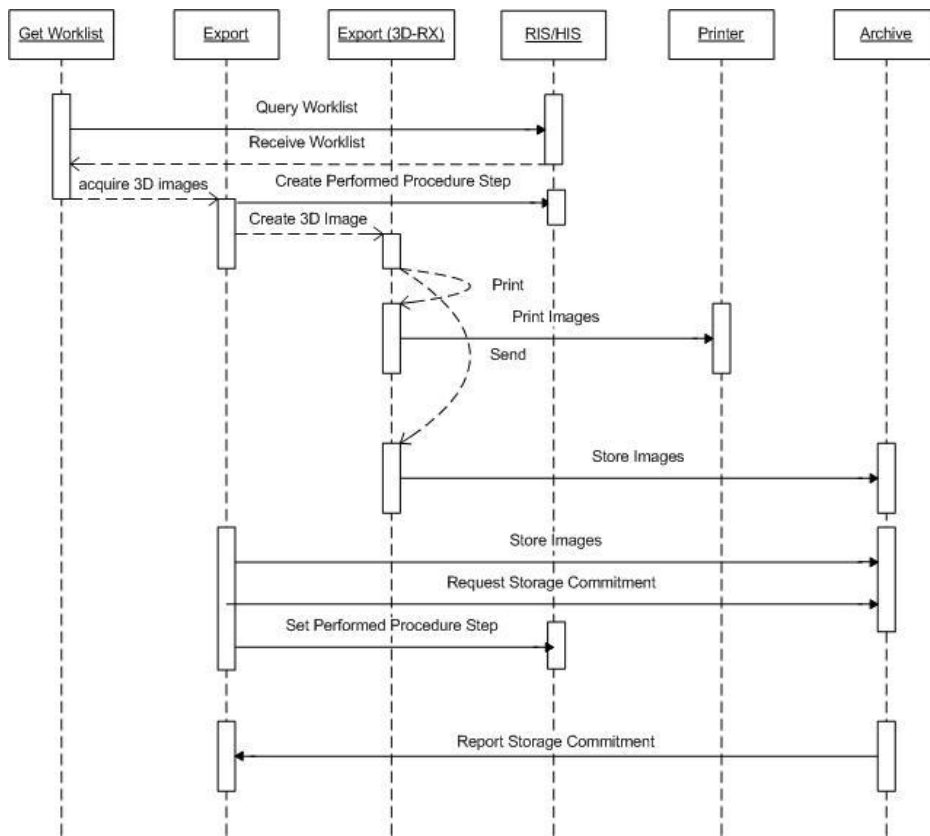


Figure 6: Typical 3D Acquisition Sequencing Constraint

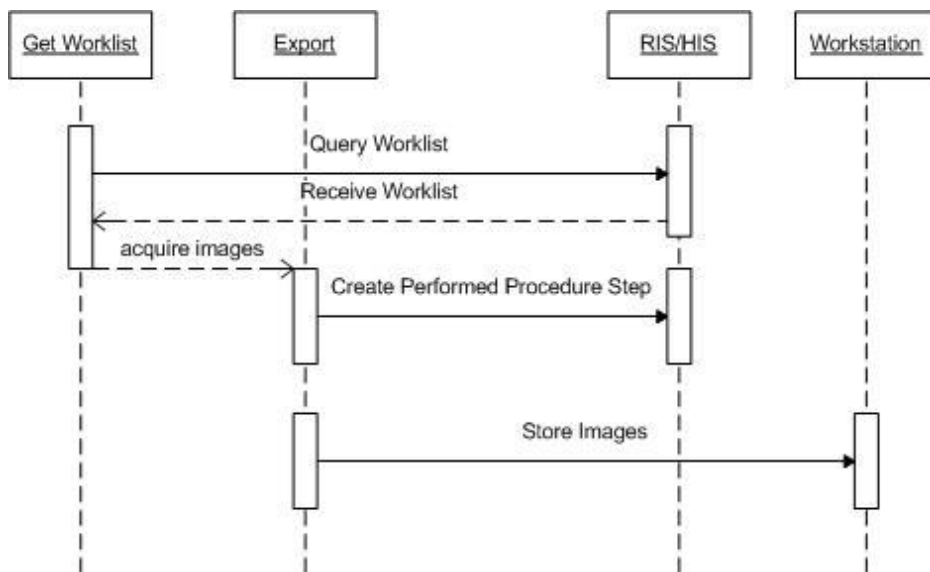


Figure 7: Typical Acquisition Workstation Storage Sequencing Constraint

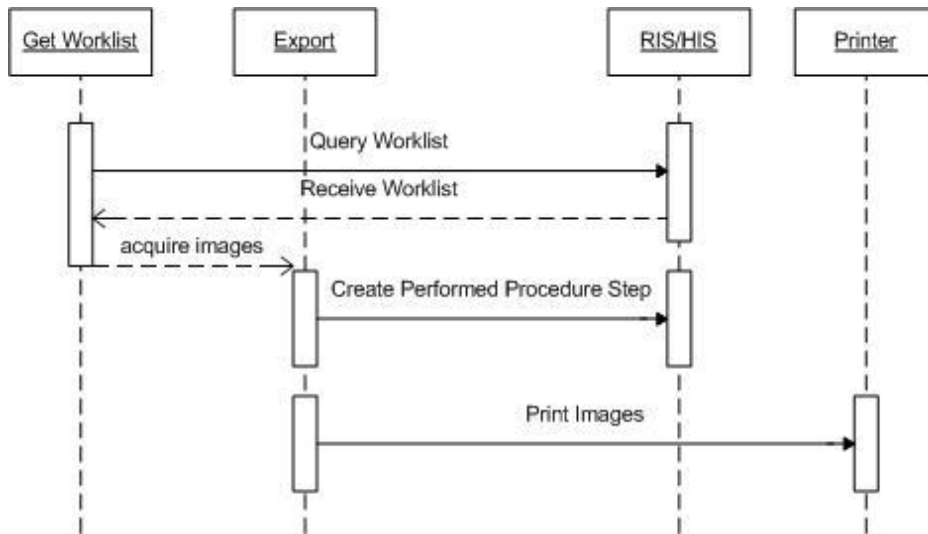


Figure 8: Typical Acquisition Print sequencing constraint

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.

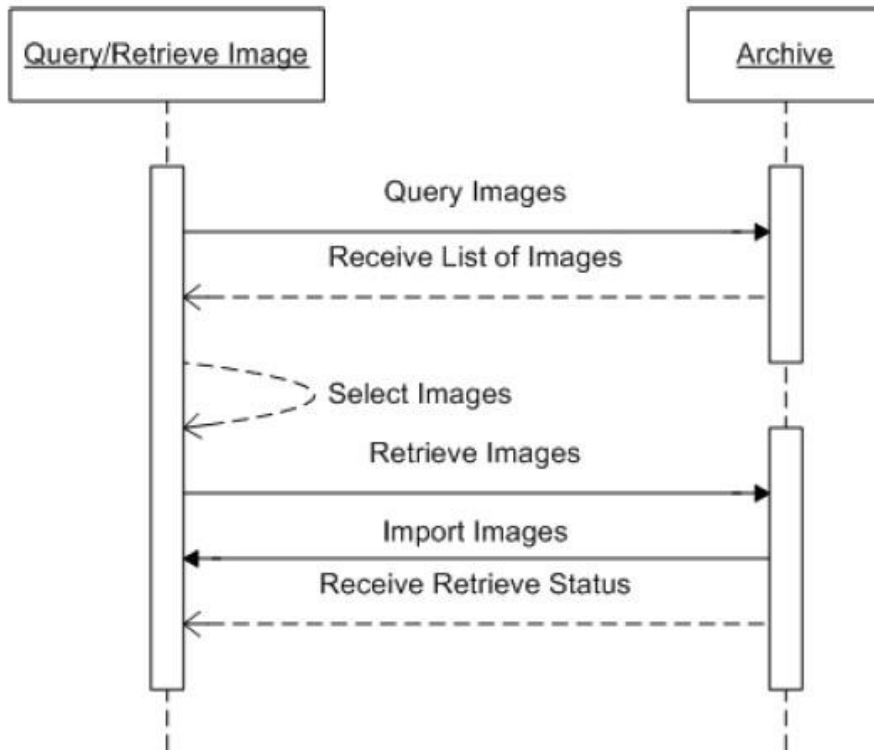


Figure 9: Typical Query/Retrieve Sequencing Constraint

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. 3D-RX Surgical Workstation 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 3D-RX Surgical 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 Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No

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

#### 4.2.1.2. Association Policies

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

##### 4.2.1.2.1. General

The DICOM standard application context 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 a Initiator or Acceptor is specified.

The 3D-RX Surgical Workstation AE may initiate 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	0

**4.2.1.2.3. Asynchronous Nature**

The 3D-RX Surgical Workstation AE does not support asynchronous operations and 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 3D-RX Surgical Workstation AE**

Implementation Class UID	1.3.46.670589.7.8.7.2
Implementation Version Name	XV_rel_7.2

**4.2.1.2.5. Communication Failure Handling**

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

**Table 10: 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"

**4.2.1.3. Association Initiation Policy**

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

**Table 11: 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.
2 - rejected-transient	1 - DICOM UL service-user	1 - temporary-congestion	Message.
		2 - Local-limit-exceeded	Message.
		1 - no-reason-given	Message.
		2 - application-context-name-not-supported	Message.
	2 - DICOM UL service-provider (ACSE related function)	3 - calling-AE-title-not-recognized	Message.
		7 - called-AE-title-not-recognized	Message.
		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 12: Association Abort Handling**

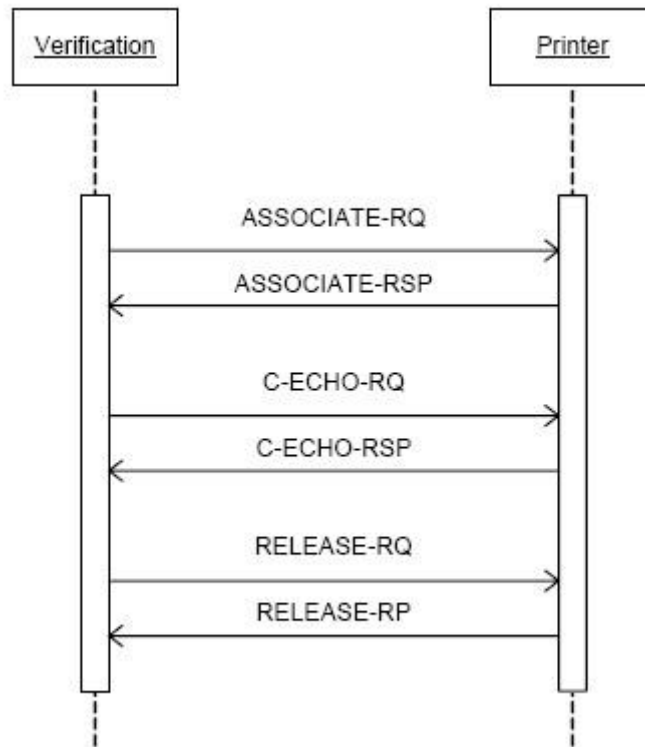
Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	Message.
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	Message.
	1 - unrecognized-PDU	Message.
	2 - unexpected-PDU	Message.
	4 - unrecognized-PDU parameter	Message.
	5 - unexpected-PDU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

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

**4.2.1.3.1.1. 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 Surgical 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 10: (Real World) Activity - 3D-RX Surgical Workstation AE as SCU**



#### 4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 13: 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.

##### 4.2.1.3.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCU

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

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

**Table 14: 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.

#### 4.2.1.3.2. (Real-World) Activity – Image Export

##### 4.2.1.3.2.1. Description and Sequencing of Activities

After selection of an image file, the file will be sent when initiating the Send command. The 3D-RX Surgical 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 Surgical Workstation AE handles each send request one after another.

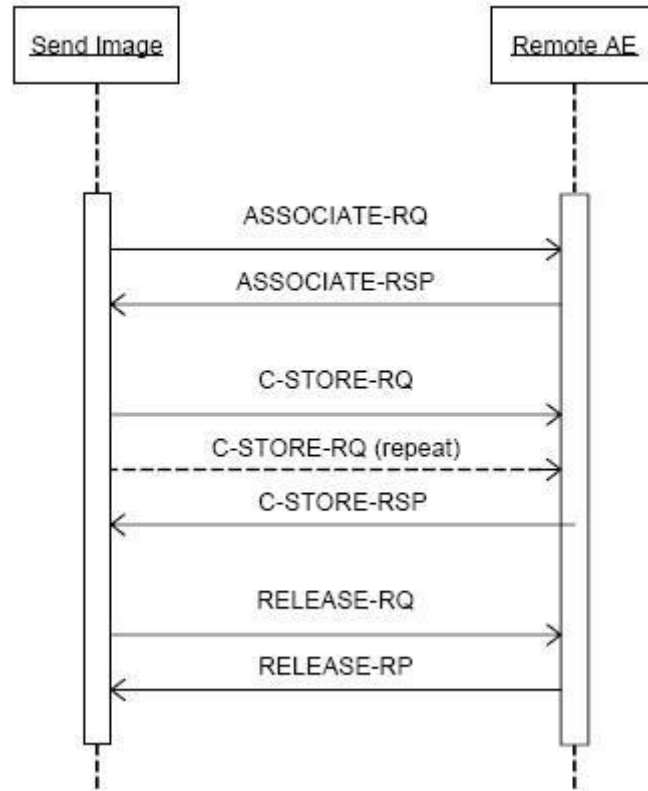


Figure 11: Real world activity Send Image.

4.2.1.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 15: 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		

4.2.1.3.2.3. 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.

4.2.1.3.2.3.1. 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 16: Status Response

Service Status	Error Code	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
	Cxx	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

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

##### 4.2.1.3.3.1. Description and Sequencing of Activities

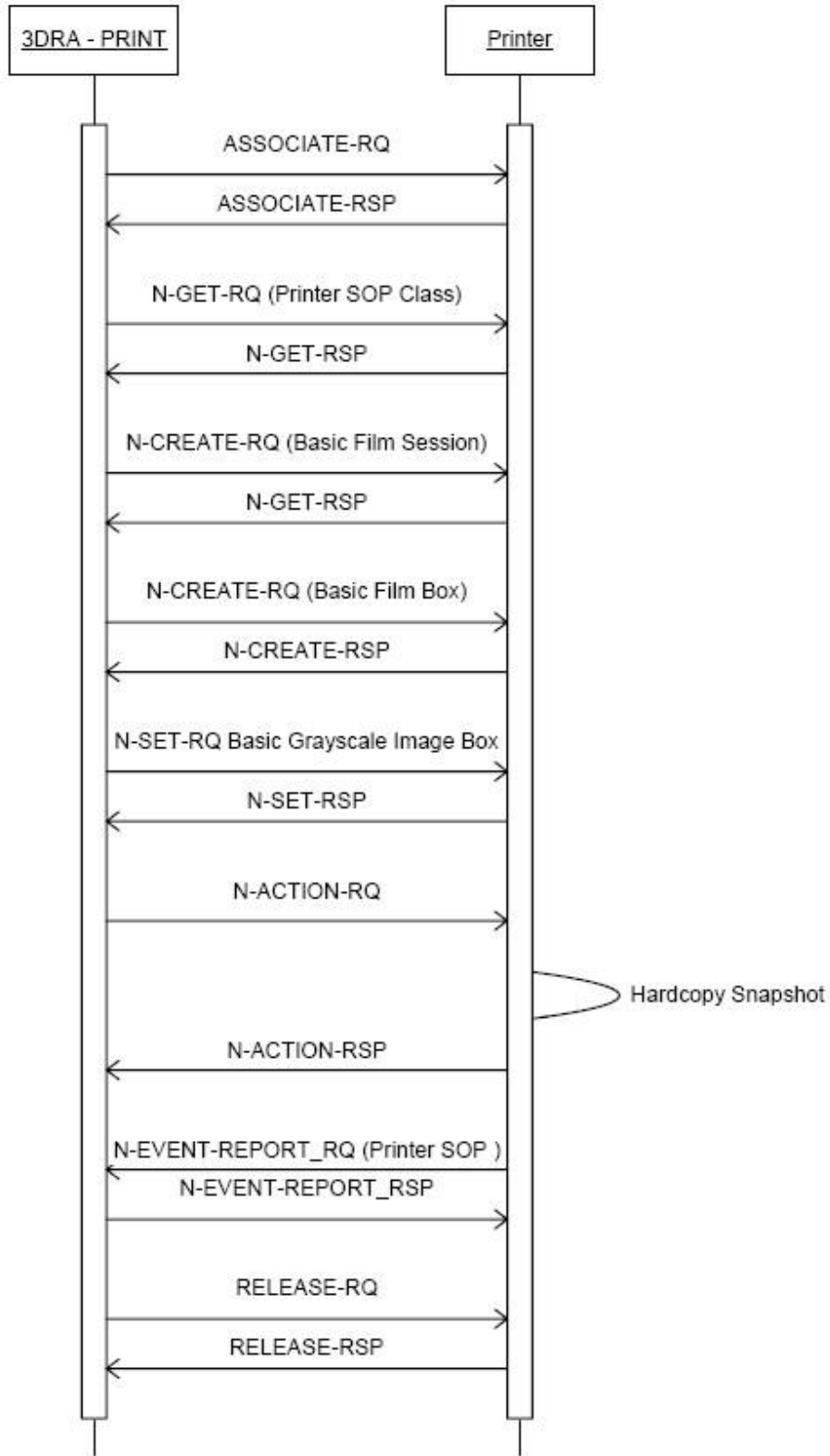


Figure 12: (Real World) Activity - Print Management As SCU

#### 4.2.1.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 17: 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 Session SOP Class	1.2.840.10008.5.1.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
>Basic 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 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		

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

#### 4.2.1.3.3.3. 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.

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

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

**Table 18: Basic Film Session Presentation Module**

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

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

**Table 19: Status Response**

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Films belonging 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 Demagnetized. 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

#### 4.2.1.3.3.4. 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.

##### 4.2.1.3.3.4.1. Dataset Specific Conformance for Printer N-GET SCU

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

**Table 20: 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 21: N-GET-RQ Response Contents**

Attribute Name	Tag	VR	Comment
Printer Status	2110,0010	CS	Retrieves the printer statuses OK or WARNING or ERROR. Xtravision takes the following actions for these responses.
			OK - Xtravision 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.

#### 4.2.1.3.3.4.2. Dataset Specific Conformance for Printer N-EVENT-REPORT SCU

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

#### 4.2.1.3.3.5. 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.

##### 4.2.1.3.3.5.1. 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 22: Status Response**

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

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

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

**Table 23: Basic Film Box Presentation Module**

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

**Table 24: 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	

#### 4.2.1.3.3.6. 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.

##### 4.2.1.3.3.6.1. 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 25: 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	
>Samples per Pixel	0028,0002	US		ALWAYS	AUTO	
>Photometric Interpretation	0028,0004	CS		ALWAYS	AUTO	
>Rows	0028,0010	US		ALWAYS	AUTO	
>Columns	0028,0011	US		ALWAYS	AUTO	
>Bits Allocated	0028,0100	US		ALWAYS	AUTO	
>Bits Stored	0028,0101	US		ALWAYS	AUTO	
>High Bit	0028,0102	US		ALWAYS	AUTO	
>Pixel Representation	0028,0103	US		ALWAYS	AUTO	
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	



#### 4.2.1.4. Association Acceptance Policy

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

**Table 26: 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	-
		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 for sending an association abort is summarized in next table.

**Table 27: 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	-

## 4.2.2. Mobile C-Arm 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 28: 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
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	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 Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No

**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 29: 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 a Initiator or Acceptor is specified.

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

**Table 30: Number of associations as an Association Initiator for this AE**

Description	Value
Maximum number of simultaneous associations	1

**Table 31: Number of associations as an Association Acceptor for this AE**

Description	Value
Maximum number of simultaneous associations	1

#### 4.2.2.2.3. Asynchronous Nature

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

#### 4.2.2.2.4. Implementation Identifying Information

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

**Table 32: DICOM Implementation Class and Version for Mobile C-Arm AE**

Implementation Class UID	1.3.46.670589.7.70.3.4
Implementation Version Name	PH Mobile C R3.4

#### 4.2.2.2.5. Communication Failure Handling

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

**Table 33: 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

#### 4.2.2.3. 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 the below table.

**Table 34: 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.

#### 4.2.2.3.1. (Real-World) Activity – Verification as SCU

##### 4.2.2.3.1.1. Description and Sequencing of Activities

In service mode the Mobile C-Arm AE can send 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.

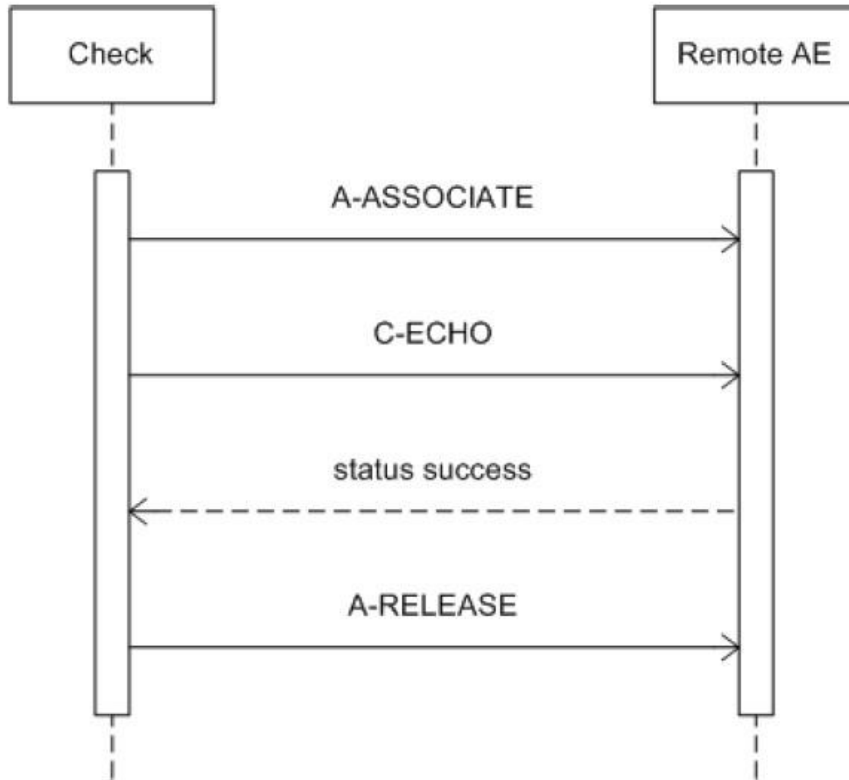


Figure 13: Sequencing of RWA Check

4.2.2.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 35: 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		

4.2.2.3.1.3. 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.

4.2.2.3.1.3.1. 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.

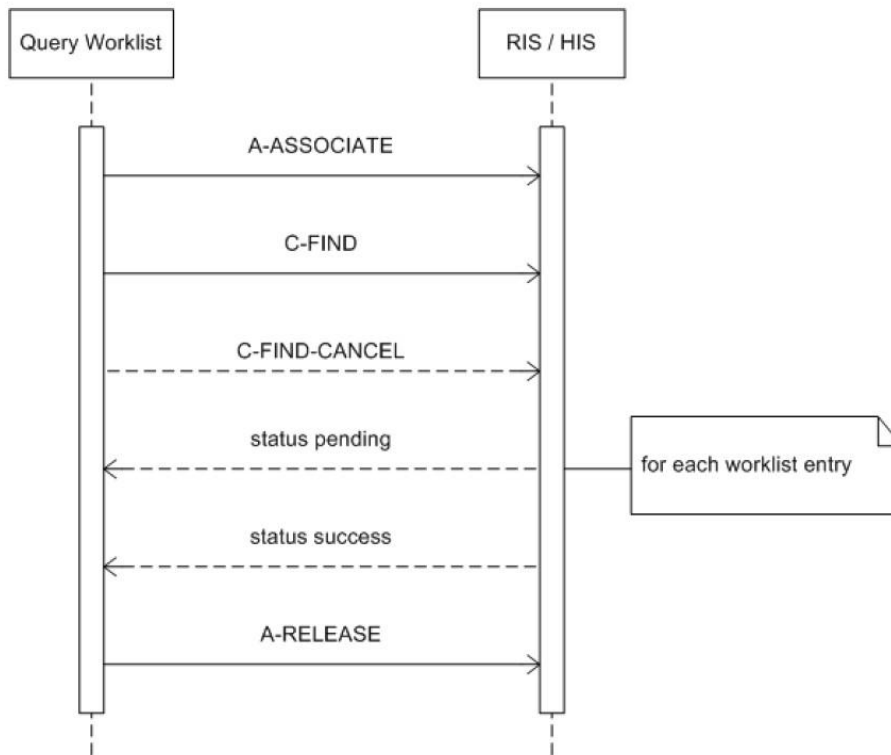
**Table 36: Status Response**

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

**4.2.2.3.2. (Real-World) Activity – Modality worklist as SCU**

**4.2.2.3.2.1. 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 14: Sequencing of RWA Get Worklist**

The worklist query is initiated by selecting "Get Worklist". Then the Mobile C-Arm AE opens an association and sends 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 37: 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 is present then the received worklist entry is ignored.

#### 4.2.2.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 38: 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 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		

#### 4.2.2.3.2.3. 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.

#### 4.2.2.3.2.3.1. 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 to 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 39: Worklist Request Identifier

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
<b>Patient Identification Module</b>									
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	
<b>Patient Demographic Module</b>									
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	X	Universal	
<b>Patient Medical Module</b>									
Allergies	0010,2110	LO		X		X		Universal	
Medical Alerts	0010,2000	LO		X		X		Universal	
Special Needs	0038,0050	LO		X		X		Universal	
<b>Visit Relationship Module</b>									
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	
<b>SOP Common Module</b>									
Specific Character Set	0008,0005	CS		X			X	Universal	
<b>Scheduled Procedure Step Module</b>									
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	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	X	Range	
>Scheduled Procedure Step Start Time	0040,0003	TM		X		X	X	Universal	
>Scheduled Station AE Title	0040,0001	AE		X	X		X	Single Value	

Attribute Name	Tag	VR	M	R	Q	D	IOD	Type of Matching	Comment
>Scheduled Station Name	0040,0010	SH		X		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	
<b>Requested Procedure Module</b>									
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	
Reason for the Requested Procedure	0040,1002	LO		X			X	Universal	
Reason for Requested Procedure Code Sequence	0040,100A	SQ		X			X	Universal	This attribute is omitted if not configured at system installation
>Code Meaning	0008,0104	LO		X			X	Universal	This attribute is omitted if not configured at system installation
>Code Value	0008,0100	SH		X			X	Universal	This attribute is omitted if not configured at system installation
>Coding Scheme Designator	0008,0102	SH		X			X	Universal	This attribute is omitted if not configured at system installation
>Coding Scheme Version	0008,0103	SH		X			X	Universal	This attribute is omitted if not configured at system installation
Requested Procedure Code Sequence	0032,1064	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	
<b>Imaging Service Request Module</b>									
Accession Number	0008,0050	SH		X	X	X	X	Single Value	
Referring Physician's Name	0008,0090	PN		X			X	Universal	
Placer Order Number / Imaging Service Request	0040,2016	LO		X			X	Universal	
Filler Order Number / Imaging Service Request	0040,2017	LO		X			X	Universal	
<b>Visit Admission Module</b>									
Admitting Diagnoses Description	0008,1080	LO		X			X	Universal	
Admitting Diagnoses Code Sequence	0008,1084	SQ		X			X	Universal	
>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	



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 40: 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.

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

##### 4.2.2.3.3.1. Description and Sequencing of Activities

After an acquisition the Mobile C-Arm AE sends related 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.

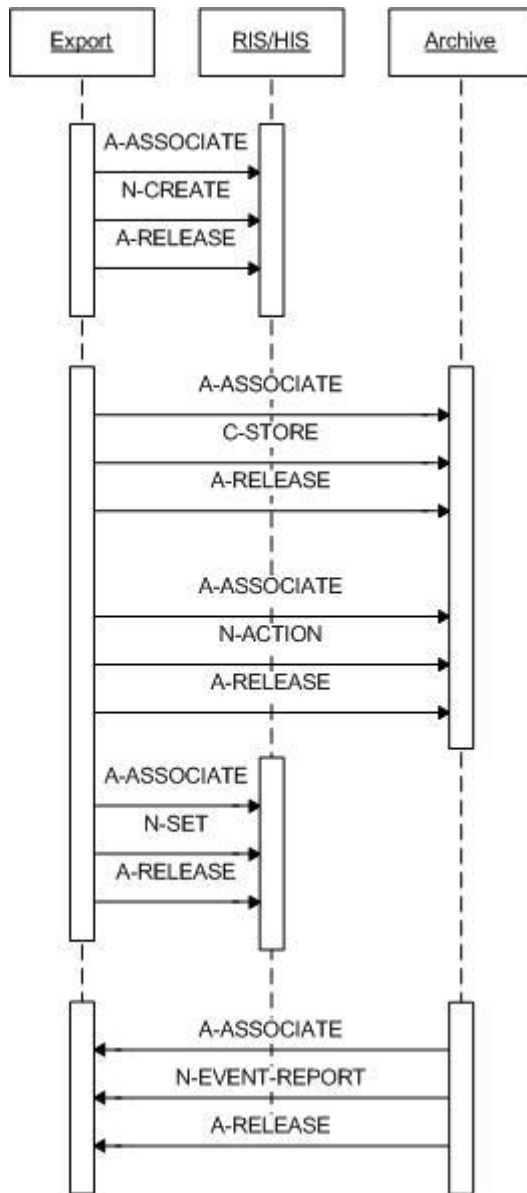


Figure 15: RWA - Modality Performed Procedure Step

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.

#### 4.2.2.3.3.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 41: 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		

#### 4.2.2.3.3.3. 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.

#### 4.2.2.3.3.3.1. 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 42: MPPS Request Identifiers for N-CREATE-RQ**

Attribute Name	Tag	VR	Value	Comment
<b>SOP Common Module</b>				
Specific Character Set	0008,0005	CS	ISO_IR 100	Required if expanded/replacement character set used.
<b>Performed Procedure Step Relationship Module</b>				
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/
>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.

Attribute Name	Tag	VR	Value	Comment
>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		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

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

**Table 43: Status Response**

Service Status	Error Code	Further Meaning	Behavior
Success	0000	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.

#### 4.2.2.3.3.3.2. 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 44: MPPS Request Identifiers for N-SET-RQ**

Attribute Name	Tag	VR	Value	Comment
<b>Performed Procedure Step Information Module</b>				
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		
<b>Image Acquisition Results Module</b>				
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.
<b>Radiation Dose Module</b>				
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 45: 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.

**4.2.2.3.4. (Real-World) Activity – Instance Export**

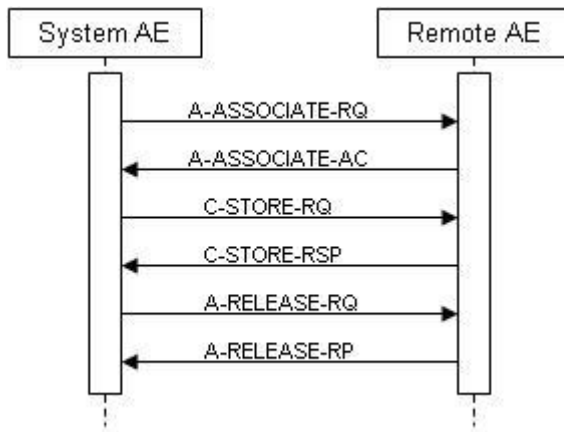
**4.2.2.3.4.1. Description and Sequencing of Activities**

After selection of an instance file, the file will be sent when initiating the Send command. The Mobile C-Arm AE initiates one association to the preconfigured peer system and uses it to send the selected instance and runs via C-STORE requests (and receives the associated C-STORE responses). The association is released after successful transfer of the instances or when an error occurs.

The following instances are supported:

- Images
- RDSRs

The Mobile C-Arm AE handles each send request one after another.



**Figure 16: RWA Export(C-STORE)**

**4.2.2.3.4.2. Proposed Presentation Contexts**

The presentation contexts are defined in next table.

**Table 46: Proposed Presentation Contexts for (Real-World) Activity – Instance Export**

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

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 Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	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		

#### 4.2.2.3.4.3. 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.

#### 4.2.2.3.4.3.1. 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 47: Status Response**

Service Status	Error Code	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.

#### 4.2.2.3.5. (Real-World) Activity – Storage Commitment Push Model as SCU

##### 4.2.2.3.5.1. 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.

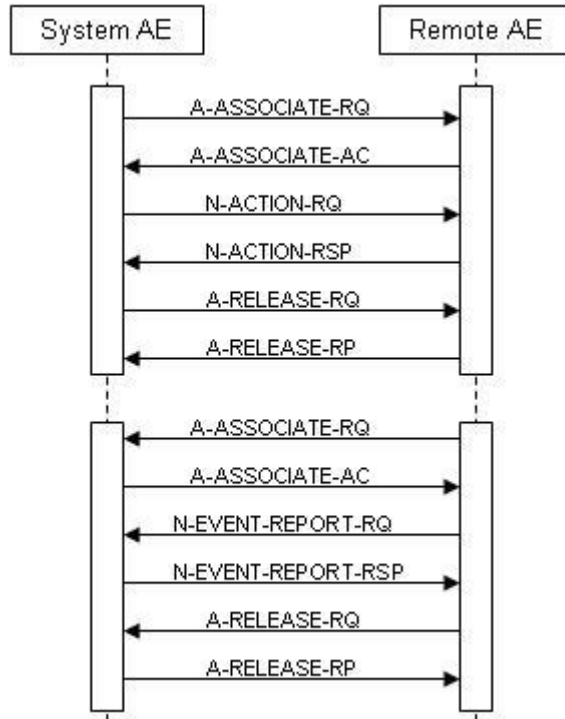


Figure 17: RWA Storage Commitment

4.2.2.3.5.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 48: 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		

4.2.2.3.5.3. 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.

4.2.2.3.5.3.1. 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 49: Storage Commitment Attribute for N-ACTION-RQ**

Attribute Name	Tag	Comment
<b>Storage Commitment Module</b>		
Transaction UID	0008,1195	Generated Unique ID 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 50: 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.

#### 4.2.2.3.5.3.2. 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 51: 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 send job that failed storage commitment will not be automatically restarted but can be resumed by the user.

**Table 52: Storage Commitment N-EVENT-REPORT Failure Handling Behavior**

Service Status	Error Code	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

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

##### 4.2.2.3.6.1. Description and Sequencing of Activities

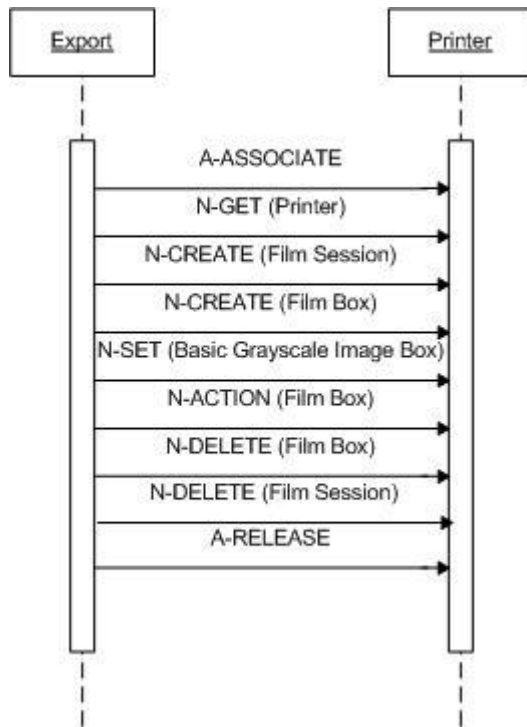


Figure 18: RWA - Print

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.

4.2.2.3.6.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 53: 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 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		
>Printer SOP Class	1.2.840.10008.5.1.1.16	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		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		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

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

#### 4.2.2.3.6.3. 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.

##### 4.2.2.3.6.3.1. 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 54: 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.

##### 4.2.2.3.6.3.2. Dataset Specific Conformance for Basic Film Session Presentation Module

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

**Table 55: Basic Film Session Presentation Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS		ALWAYS	CONFIG	Integer (1-99)
Print Priority	2000,0020	CS	HIGH, LOW, MED	ALWAYS	CONFIG	
Medium Type	2000,0030	CS	BLUE FILM, CLEAR FILM, CURRENT, PAPER, TRANSPARENCY	ALWAYS	CONFIG	
Film Destination	2000,0040	CS	BIN_i (i=Integer), CURRENT, MAGAZINE, PROCESSOR	ALWAYS	CONFIG	(i=Integer)
Film Session Label	2000,0050	LO		ALWAYS	AUTO	Equal to Exam Type

**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 56: 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.

#### 4.2.2.3.6.4. 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.

##### 4.2.2.3.6.4.1. Dataset Specific Conformance for Printer N-GET SCU

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

**Table 57: 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.

##### 4.2.2.3.6.4.2. 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 58: Printer - N-EVENT-REPORT Behavior**

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

#### 4.2.2.3.6.5. 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.

##### 4.2.2.3.6.5.1. Dataset Specific Conformance for Basic Film Box N-ACTION SCU

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

**Table 59: Status Response.**

Service Status	Error Code	Further Meaning	Description
Success	0000	Successful operation.	The print job continues.
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 Demagnetized.	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.

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

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

**Table 60: Basic Film Box Presentation Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Display Format	2010,0010	ST	STANDARD\1,1, STANDARD\1,2, STANDARD\2,2, STANDARD\2,3	ALWAYS	USER	
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	ALWAYS	CONFIG	

Film Size ID	2010,0050	CS	10INX12IN, 10INX14IN, 11INX11IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, 8_5INX11IN, 8INX10IN, A3, A4, CURRENT	ALWAYS	CONFIG	
Magnification Type	2010,0060	CS	BILINEAR, CUBIC, NONE, REPLICATE	ALWAYS	CONFIG	
Smoothing Type	2010,0080	CS	1, 10, 11, 12, 13, 14, 140, 15, 2, 3, 4, 5, 6, 7, 8, 9, ENHANCED, ENHANCED1, MEDIUM, NORMAL, SHARP, SMOOTH	ALWAYS	CONFIG	
Border Density	2010,0100	CS	BLACK, OD (integer), WHITE	ALWAYS	CONFIG	(i), integer range: 0..1000
Empty Image Density	2010,0110	CS	BLACK, WHITE	ALWAYS	CONFIG	
Min Density	2010,0120	US	0..1000	ALWAYS	CONFIG	
Max Density	2010,0130	US	0..1000	ALWAYS	CONFIG	
Trim	2010,0140	CS	NO, YES	ALWAYS	CONFIG	
Configuration Information	2010,0150	ST		ALWAYS	CONFIG	Printer configurable character string (max. 1024 char.)

Table 61: 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 62: 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.

#### 4.2.2.3.6.6. 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.

##### 4.2.2.3.6.6.1. 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 63: 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	CONFIG	
Basic Grayscale Image Sequence	2020,0110	SQ		ALWAYS	AUTO	
>Samples per Pixel	0028,0002	US	1	ALWAYS	FIXED	
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	
>Rows	0028,0010	US	1024	ALWAYS	FIXED	
>Columns	0028,0011	US	1280	ALWAYS	FIXED	
>Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	
>Bits Stored	0028,0101	US	12	ALWAYS	FIXED	
>High Bit	0028,0102	US	11	ALWAYS	FIXED	
>Pixel Representation	0028,0103	US	0x0000	ALWAYS	FIXED	
>Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

**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 64: 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.

#### 4.2.2.4. Association Acceptance Policy

Not applicable.



### 4.2.3. ViewForum Surgical 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 65: 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
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
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	No	Yes
Philips Private Reconstructed X-ray Storage	1.3.46.670589.2.4.1.1	No	Yes
Philips Private ViewForum 3D Volume New Storage	1.3.46.670589.5.0.1.1	No	Yes
Philips Private ViewForum MR Synthetic Image Storage	1.3.46.670589.5.0.10	No	Yes
Philips Private ViewForum MR Cardio Analysis New Storage	1.3.46.670589.5.0.11.1	No	Yes
Philips Private ViewForum CX Synthetic Image Storage	1.3.46.670589.5.0.12	No	Yes
Philips Private ViewForum Perfusion Storage	1.3.46.670589.5.0.13	No	Yes
Philips Private ViewForum Perfusion Analysis Storage	1.3.46.670589.5.0.14	No	Yes
Philips Private ViewForum 3D Volume Object New Storage	1.3.46.670589.5.0.2.1	No	Yes
Philips Private ViewForum Surface New Storage	1.3.46.670589.5.0.3.1	No	Yes
Philips Private ViewForum MR Cardio New Storage	1.3.46.670589.5.0.8.1	No	Yes
Philips Private ViewForum CT Synthetic Image Storage	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.

#### 4.2.3.2. 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 66: 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 a Initiator or Acceptor is specified.

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

**Table 67: Number of associations as an Association Initiator for this AE**

Description	Value
Maximum number of simultaneous associations	1

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

Description	Value
Maximum number of simultaneous associations	configurable

#### 4.2.3.2.3. Asynchronous Nature

The ViewForum Surgical 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 69: 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

#### 4.2.3.2.5. Communication Failure Handling

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

**Table 70: 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.

#### 4.2.3.3. Association Initiation Policy

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

**Table 71: 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 72: 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	-

#### 4.2.3.3.1. (Real-World) Activity – FIND as SCU

##### 4.2.3.3.1.1. 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 sends a retrieve request and accepts the related images.

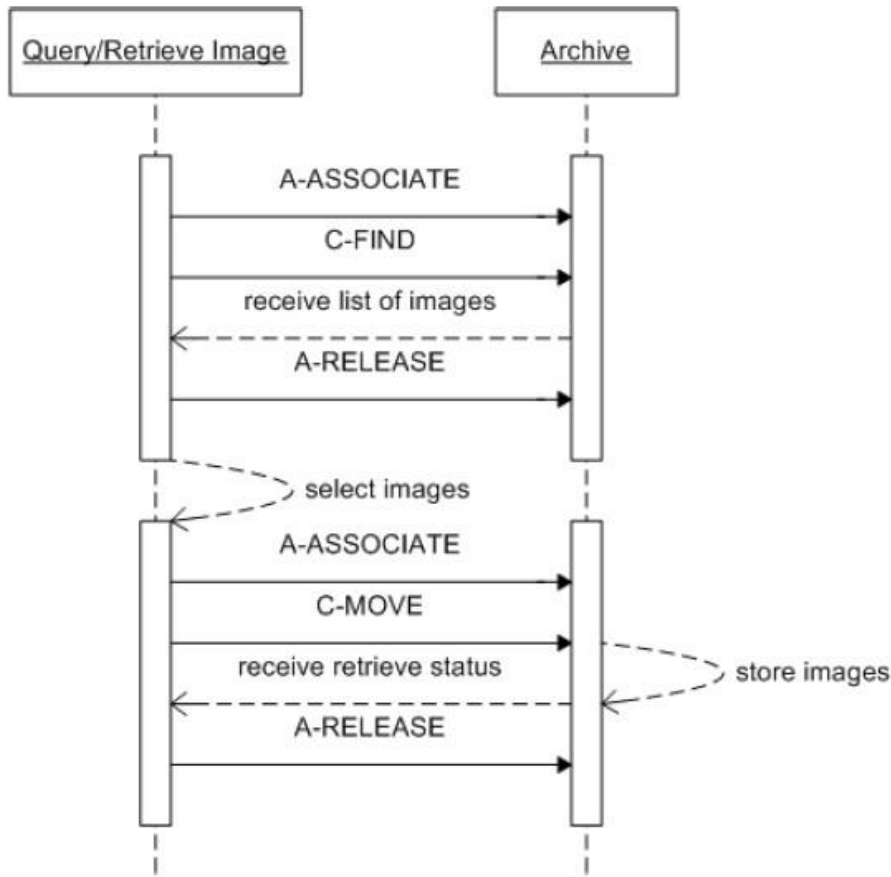


Figure 19: Sequencing of RWA Query/Retrieve Image

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 send Query (C-FIND) requests and receive 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 send 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).

4.2.3.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 73: Proposed Presentation Contexts for (Real-World) Activity – FIND as SCU

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

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Model - FIND SOP Class		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
PatientStudy 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		

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

**4.2.3.3.1.3. 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.

**4.2.3.3.1.3.1. 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 74: Supported Query Keys for Extended Dicom and Private attributes**

Extended Dicom and Private attributes					
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 75: 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.

Service Status	Error Code	Further Meaning	Behavior
	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.

#### 4.2.3.3.1.4. 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.

##### 4.2.3.3.1.4.1. 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 76: Supported Query Keys for Extended Dicom and Private attributes**

Extended Dicom and Private attributes				
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 77: 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.

Service Status	Error Code	Further Meaning	Behavior
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.

#### 4.2.3.3.1.5. SOP Specific Conformance for PatientStudy 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.

##### 4.2.3.3.1.5.1. 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 78: 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.

#### 4.2.3.3.2. (Real-World) Activity – MOVE as SCU

##### 4.2.3.3.2.1. Description and Sequencing of Activities

Refer to chapter 4.2.3.3.1.1 for the description and sequencing diagram.

##### 4.2.3.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

**Table 79: Proposed Presentation Contexts for (Real-World) Activity – MOVE As SCU**

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

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

#### 4.2.3.3.2.3. 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.

##### 4.2.3.3.2.3.1. 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 80: 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.



#### 4.2.3.3.2.4. 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.

##### 4.2.3.3.2.4.1. 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 81: 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.

#### 4.2.3.3.2.5. SOP Specific Conformance for PatientStudy Only QR Info. 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.

##### 4.2.3.3.2.5.1. 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 82: 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.

#### 4.2.3.4. Association Acceptance Policy

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

**Table 83: 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 for sending an association abort is summarized in next table

**Table 84: 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.

##### 4.2.3.4.1. (Real-World) Activity – Verification as SCP

###### 4.2.3.4.1.1. Description and Sequencing of Activities

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

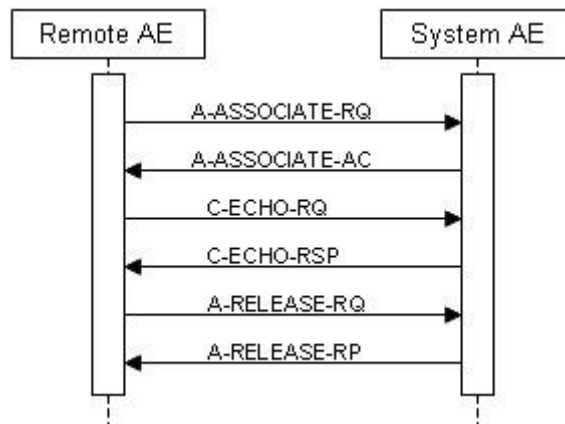


Figure 20: Sequencing of RWA Verification as SCP

4.2.3.4.1.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 85: 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		

4.2.3.4.1.3. 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.

4.2.3.4.1.3.1. 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 86: Status Response

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

4.2.3.4.2. (Real-World) Activity – Image Import

4.2.3.4.2.1. Description and Sequencing of Activities

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

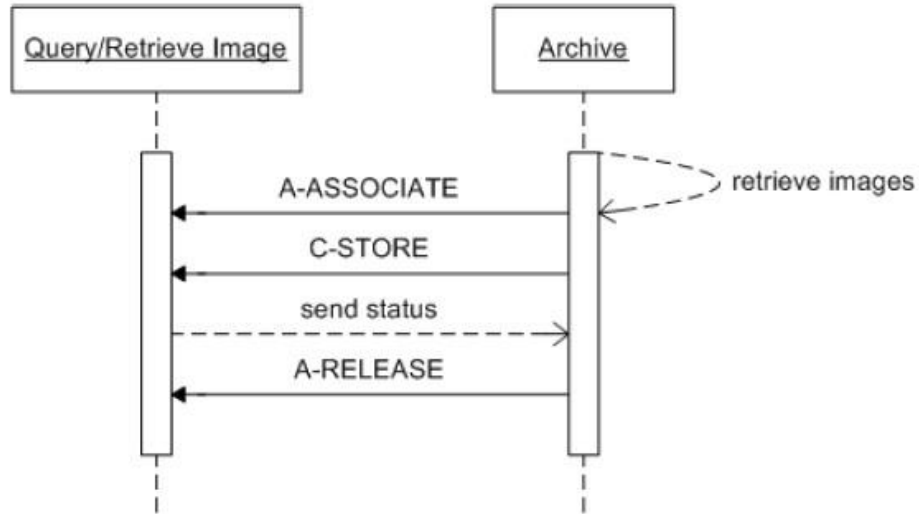


Figure 21: Sequencing of RWA Query/Retrieve Image

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 send subsequent responses. On request of the Storage SCU (Archive) the association is released.

4.2.3.4.2.2. Accepted Presentation Contexts

The presentation contexts are defined in next table.

Table 87: 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		
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		
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		
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 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		
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		
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		

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
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		
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		
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		
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
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		
Philips Private X-Ray Image Storage	1.3.46.670589.2.3.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Implicit VR Little Endian	1.2.840.10008.1.2		
Philips Private Reconstructed X-ray Storage	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		
Philips Private ViewForum 3D Volume New Storage	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		
Philips Private ViewForum MR Synthetic Image Storage	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		
Philips Private ViewForum MR Cardio Analysis New Storage	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		
Philips Private ViewForum CX Synthetic Image Storage	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		
Philips Private ViewForum Perfusion Storage	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		
Philips Private ViewForum Perfusion Analysis Storage	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		
Philips Private ViewForum 3D Volume Object New Storage	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		
Philips Private ViewForum Surface New Storage	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		
Philips Private ViewForum MR	1.3.46.670589.5.0.8.1	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		
Cardio New Storage		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR Little Endian	1.2.840.10008.1.2		
Philips Private ViewForum CT Synthetic Image Storage	1.3.46.670589.5.0.9	Explicit VR Big Endian	1.2.840.10008.1.2.2		
		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.

#### 4.2.3.4.2.3. 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.

#### 4.2.3.4.2.3.1. 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 88: 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 sends a notification, log the condition, and abort the association.
	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 sends a notification, log the condition, and abort the association.
	C000	Error: cannot understand	The image(s) cannot be parsed. The ViewForum Surgical Workstation AE sends 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

## 4.3. 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 Surgical 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 Surgical 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 Surgical 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 BV Family:



- 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 send 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) (RDSR) 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
<b>AE Specific Parameters</b>		
SOP Class support	Yes	MPPS Storage Commitment Printer
<b>Local System Parameters</b>		
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)
<b>Export Target(s) (Store) Parameters</b>		
AE Title	Yes	"No Name"
Name	Yes	Max. 25 char. Unique
IP Address	Yes	0.0.0.0
Port number	Yes	104

Parameter	Configurable	Default Value
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
<b>Export Target(s) (Print) Parameters</b>		
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
<b>Export Target(s) (X-Ray Radiation Dose) Parameters</b>		
Enable DICOM Structured Dose Report	Yes	No
Target 1 configuration		
Name	Yes	"No name"
AE Title	Yes	"No name"
IP address	Yes	0.0.0.0
Port number	Yes	104
Storage Commit	Yes	Enable
SC AE Title	Yes	"No name"
SC IP address	Yes	0.0.0.0
SC Port Number	Yes	104
Target 2 configuration		
Name	Yes	"No name"
Enable	Yes	No
AE Title	Yes	"No name"
IP address	Yes	0.0.0.0
Port number	Yes	104
Target 3 configuration		
Name	Yes	"No name"
Enable	Yes	No
AE Title	Yes	"No name"

Parameter	Configurable	Default Value
IP address	Yes	0.0.0.0
Port number	Yes	104
<b>Worklist Management Target Parameters</b>		
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
Query Attribute (0040,100A)	Yes	No
<b>MPPS Target Parameters</b>		
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"
MPPS also for unscheduled cases	Yes	"Yes"
<b>Storage commit (N-EVENT-REPORT) Parameters</b>		
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
<b>General Parameters</b>		
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. (Low-level 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. (Low-level timeout)	No	-
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
<b>Local Configurable AE Specific Parameters</b>		
Size constraint in maximum object size	No	-
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can send	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	-
<b>Remote Configurable AE Specific Parameters</b>		
Size constraint in maximum object size	No	-

Parameter	Configurable	Default Value
Maximum PDU size the AE can receive	Yes	0 (unlimited)
Maximum PDU size the AE can send	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 Surgical Workstation AE**

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

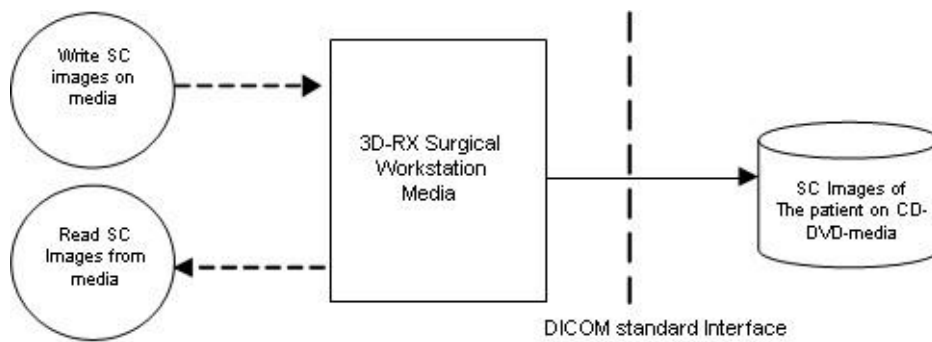
## 5. Media Interchange

### 5.1. Implementation model

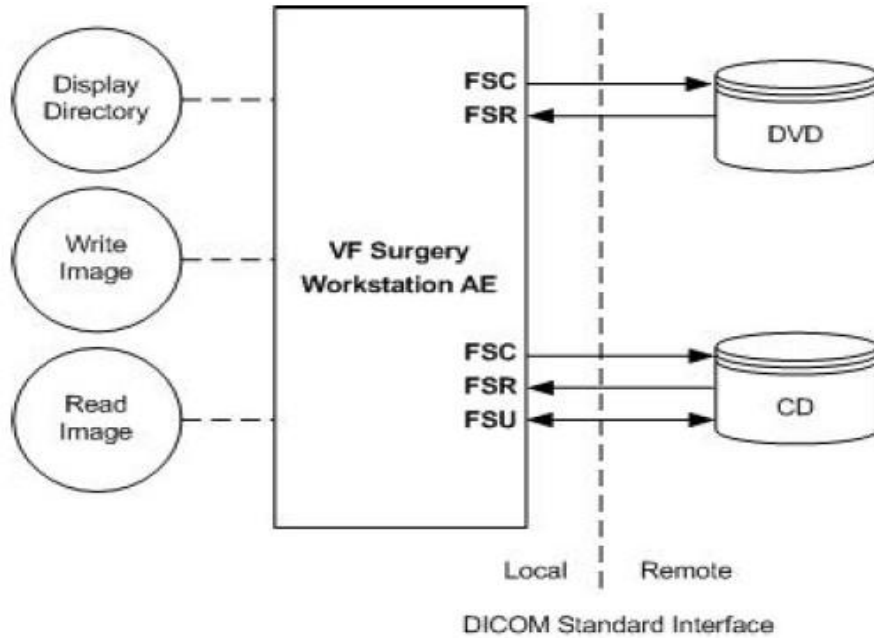
The implementation model identifies the DICOM Application Entities for Media in specific implementation and relates the Application Entities to Real-World Activities.

#### 5.1.1. Application Data Flow Diagram

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



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



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

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 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:** DVD-R and DVD-RW can be read but are not supported for writing.

**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.

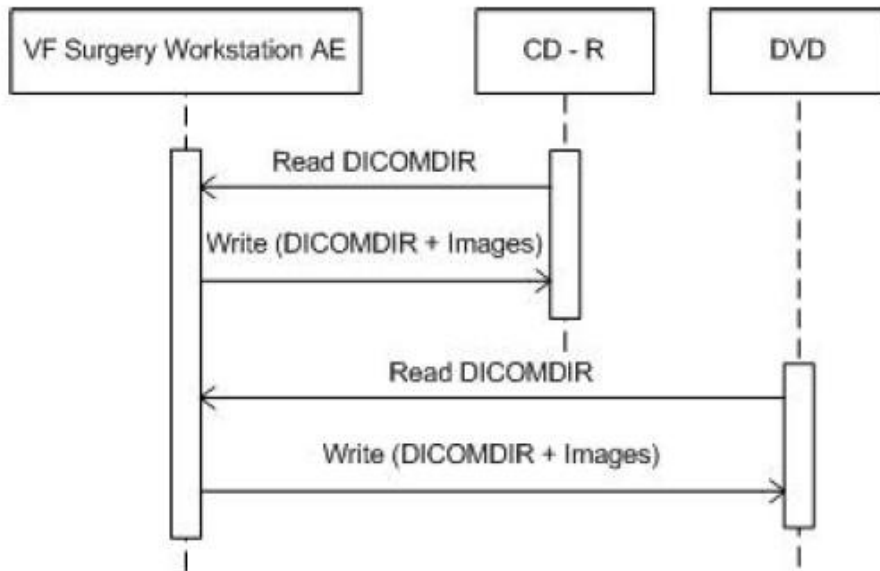


Figure 24: Sequencing of RWA Write Image

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/DVD, both for reading and writing. Supported media by ViewForum Surgical Workstation AE are:

- For CD: CDR / CD RW with the profile: STD-GEN-CD
- For DVD: DVD+R and DVD+RW with the profile STD-GEN-DVD-JPEG and the Transfer Syntax 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 then the ViewForum Surgical Workstation AE 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 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 Creator 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(W) media, not DVD-R(W) 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. 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
<b>Patient Keys</b>		
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.
<b>Study Keys</b>		
Study Date	0008,0020	Current date
Study Time	0008,0030	Current time
Study ID	0020,0010	"UNKNOWN"
<b>Series Keys</b>		
Series Number	0020,0011	1
<b>Image Keys</b>		
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 multimedia 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 Surgical 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 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	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 Surgical 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 Surgical 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 Creator 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/DVD, the DICOM Secondary Capture images are stored in the first CD/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/DVD of the series. If the data of a single directory is too large (for example, XperCT run), then it has to be written to DVDs. In this case, it will not be possible to write this data to multiple CDs.

**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 specialized non-DICOM information only.

The 3D-RX Surgical Workstation 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 Surgical 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

None.

##### 5.3.1.1. Augmented Application Profile AUG-GEN-DVD-JPEG

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

##### 5.3.1.1.1. SOP Class Augmentations

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
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 is 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 confirming 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 anonymized 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
Study Description	0008,1030	LO	COPY
Series Description	0008,103E	LO	COPY
Institutional Department Name	0008,1040	LO	n.a.

Name	Tag	VR	Replacement Value
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 UID	0040,0275	SQ	n.a.
Content Sequence	0040,A124	UI	n.a.
Storage Media File-set UID	0040,A730	SQ	n.a.
Referenced Frame of Reference UID	0088,0140	UI	n.a.
Related 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 "3D-RX Surgical Workstation AE"

### 8.1. IOD Contents

#### 8.1.1. Created SOP Instance

This section specifies each created IOD by this application.

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

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

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

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

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

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

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

##### 8.1.1.1. List of created SOP Classes

**Table 106: 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

##### 8.1.1.2. CT Image Storage SOP Class

**Table 107: 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	Image Plane Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Contrast/Bolus Module	ALWAYS
Image	CT Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 108: Patient Module

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

Table 109: General Study Module

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

Table 110: General Series Module

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

**Table 111: 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 112: General Equipment Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems (Netherlands)	ALWAYS	FIXED	
Institution Name	0008,0080	LO		VNAP	AUTO	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	XtraVision	ALWAYS	CONFIG	
Software Version(s)	0018,1020	LO	Value 1: R_7.2	ALWAYS	CONFIG	

**Table 113: General Image Module**

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

**Table 114: Image Plane Module**

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

**Table 115: Image Pixel Module**

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

**Table 116: Contrast/Bolus Module**

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

**Table 117: 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 118: 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 119: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	
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	

### 8.1.1.3. Secondary Capture Image Storage SOP Class

Table 120: 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
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SC Image Module	ALWAYS
Image	VOI LUT Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 121: Patient Module

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

Table 122: General Study Module

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

Study ID	0020,0010	SH		ALWAYS	AUTO	
----------	-----------	----	--	--------	------	--

Table 123: General Series Module

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

Table 124: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems (Netherlands)	ALWAYS	FIXED	
Institution Name	0008,0080	LO		ALWAYS	CONFIG	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	XtraVision	ALWAYS	CONFIG	
Software Version(s)	0018,1020	LO	Value 1: R_7.2	ALWAYS	CONFIG	

Table 125: SC Equipment Module

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

**Table 126: General 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	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		EMPTY	FIXED	

**Table 127: 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	ALWAYS	FIXED	
Bits Stored	0028,0101	US	8	ALWAYS	FIXED	
High Bit	0028,0102	US	7	ALWAYS	FIXED	
Pixel Representation	0028,0103	US	0	ALWAYS	FIXED	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

**Table 128: 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 129: 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 130: SOP Common Module**

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	
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	

### 8.1.2. Usage of Attributes from Received IOD

Not applicable.

### 8.1.3. Attribute Mapping

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

**Table 131: Attribute Mapping of the 3D-RX Surgical Workstation AE**

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

#### 8.1.4. Coerced/Modified fields

Not applicable.

## 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

Not applicable.

## 8.5. Standard Extended/Specialized/Private SOPs

The CT Image Storage SOP Class is a standard specialized SOP class as specified in section 8.1.1.2.

## 8.6. Private Transfer Syntaxes

Not applicable.



## 9. Annexes of application "Mobile C-Arm AE"

### 9.1. IOD Contents

#### 9.1.1. Created SOP Instance

This section specifies each created IOD by this application.

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

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

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

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

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

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

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

#### 9.1.1.1. List of created SOP Classes

Table 132: 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
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67

#### 9.1.1.2. Secondary Capture Image Storage SOP Class

Table 133: 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
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS

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

Table 134: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
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 Sex	0010,0040	CS	F, M, O	ALWAYS	MWL, USER	
Other Patient IDs	0010,1000	LO		VNAP	MWL	
Other Patient Names	0010,1001	PN		VNAP	MWL	

Table 135: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	<yyyymmdd>
Study Time	0008,0030	TM		ALWAYS	AUTO	<hhmmss>
Accession Number	0008,0050	SH		ALWAYS	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL	
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.
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	From Requested Procedure Code Sequence (0032,1064) of MWL. If empty in MWL, should not be present in Image IOD
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Coding Scheme Version	0008,0103	SH		ANAP	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	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	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO, MWL	
Study ID	0020,0010	SH		ALWAYS	MWL	From Requested Procedure ID (0040,1001) of MWL

Table 136: Patient Study Module

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

Table 137: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	For Dose Reports Export Date will be used.
Series Time	0008,0031	TM		ALWAYS	AUTO	For Dose Reports Export Time will be used.
Series Description	0008,103E	LO		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.
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	
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 Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	
Laterality	0020,0060	CS		EMPTY	FIXED	
Request Attributes Sequence	0040,0275	SQ		ALWAYS	MWL	
>Requested Procedure Description	0032,1060	LO		ALWAYS	MWL	
>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		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	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	MWL	
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	Examination Date
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	Examination Time
Performed Procedure Step ID	0040,0253	SH		ALWAYS	AUTO	Internal counter
Performed Procedure Step Description	0040,0254	LO		ALWAYS	AUTO	Same as Study Description (0008,1030)

Table 138: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	Philips Medical Systems.
Institution Name	0008,0080	LO		ANAP	CONFIG	Hospital Name.

Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	"BV Endura" or "BV Pulsera" or "Veradius" depending on the system type.

Table 139: SC Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS	XA	ALWAYS	AUTO	XA, for Dose report only OT
Conversion Type	0008,0064	CS	DI	ALWAYS	AUTO	
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 Endura" or "BV Pulsera" or "Veradius" depending on the system type.
Secondary Capture Device Software Version(s)	0018,1019	LO	Value 1: PH Mobile C R3.4	ALWAYS	AUTO	

Table 140: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	<yyyymmdd>
Content Time	0008,0033	TM		ALWAYS	AUTO	<hhmmss>
Irradiation Event UID	0008,3010	UI		ANAP	AUTO	When RDSR is enabled for SC images based on X-ray image
Instance Number	0020,0013	IS		ALWAYS	AUTO	Generated running number
Patient Orientation	0020,0020	CS		EMPTY	FIXED	

Table 141: 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	
Rows	0028,0010	US	1024	ALWAYS	AUTO	
Columns	0028,0011	US	1024	ALWAYS	AUTO	For images with text: 1280
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 Representation	0028,0103	US	0	ALWAYS	AUTO	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 142: 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 143: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	Required if expanded/replacement character set used.
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	

## 9.1.1.3. X-Ray Angiographic Image Storage SOP Class

Table 144: 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
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	Cine Module	ALWAYS
Image	Multi-Frame Module	ALWAYS
Image	X-Ray Image Module	ALWAYS
Image	X-Ray Acquisition Module	ALWAYS
Image	XA Positioner Module	ALWAYS
Image	SOP Common Module	ALWAYS

Table 145: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
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 Sex	0010,0040	CS	F, M, O	ALWAYS	MWL, USER	
Other Patient IDs	0010,1000	LO		VNAP	MWL	
Other Patient Names	0010,1001	PN		VNAP	MWL	

Table 146: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	<yyyymmdd>
Study Time	0008,0030	TM		ALWAYS	AUTO	<hhmmss>
Accession Number	0008,0050	SH		ALWAYS	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL	

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.
Procedure Code Sequence	0008,1032	SQ		ANAP	MWL	From Requested Procedure Code Sequence (0032,1064) of MWL. If empty in MWL, should not be present in Image IOD
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Coding Scheme Version	0008,0103	SH		ANAPCV	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	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	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	MWL	From Requested Procedure ID (0040,1001) of MWL

Table 147: Patient Study Module

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

Table 148: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	XA	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).
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.
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	
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 Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	Increasing number that identifies series (run)
Laterality	0020,0060	CS		EMPTY	FIXED	
Request Attributes Sequence	0040,0275	SQ		ALWAYS	MWL	
>Requested Procedure Description	0032,1060	LO		ALWAYS	MWL	

>Scheduled Procedure Step Description	0040,0007	LO		ALWAYS	MWL	
>Scheduled Protocol Code Sequence	0040,0008	SQ		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	
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Scheduled Procedure Step ID	0040,0009	SH		ALWAYS	MWL	
>Requested Procedure ID	0040,1001	SH		ALWAYS	MWL	
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	
Performed Procedure Step ID	0040,0253	SH		ANAP	AUTO	Internal counter.
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.

Table 149: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	Philips Medical Systems.
Institution Name	0008,0080	LO		ANAP	CONFIG	Hospital Name.
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	"BV Endura" or "BV Pulsera" or "Veradius" depending on the system type.
Software Version(s)	0018,1020	LO	Value 1: PH Mobile C R3.4	ALWAYS	AUTO	

Table 150: 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>
Irradiation Event UID	0008,3010	UI		ANAP	AUTO	When RDSR is enabled.
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Patient Orientation	0020,0020	CS		EMPTY	FIXED	

Table 151: Image Pixel Module

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

Table 152: Cine Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Start Trim	0008,2142	IS	1	ALWAYS	AUTO	
Stop Trim	0008,2143	IS		ALWAYS	AUTO	Number of images in the run.
Recommended Display Frame Rate	0008,2144	IS		ANAP	AUTO	Acquisition speed.
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	

Table 153: 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 154: X-Ray Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: ORIGINAL, Value 2: PRIMARY	ALWAYS	AUTO	
Samples per Pixel	0028,0002	US	1	ALWAYS	AUTO	
Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	AUTO	
Frame Increment Pointer	0028,0009	AT	0x00181063	ALWAYS	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 Representation	0028,0103	US	0	ALWAYS	AUTO	
Pixel Intensity Relationship	0028,1040	CS	LIN	ALWAYS	AUTO	

Table 155: X-Ray Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
KVP	0018,0060	DS		EMPTY	FIXED	-
Field of View Shape	0018,1147	CS	ROUND	ALWAYS	AUTO	-
Exposure	0018,1152	IS		EMPTY	FIXED	-
Radiation Setting	0018,1155	CS	GR, SC	ALWAYS	AUTO	-
Type of Filters	0018,1161	LO	Value 1: NONE	ALWAYS	AUTO	-
Intensifier Size	0018,1162	DS		ALWAYS	AUTO	-
Imager Pixel Spacing	0018,1164	DS		ANAP	AUTO	Absent during detector format switch
Grid	0018,1166	CS	IN	ALWAYS	AUTO	EMPTY for Veradius.
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 Type	0028,0A02	CS	GEOMETRY	ANAP	AUTO	For 3D runs 'GEOMETRY'. For all other runs absent.
Pixel Spacing Calibration Description	0028,0A04	LO		ANAP	AUTO	For 3D runs 'Pixel Spacing in center of rotation'. For all other runs absent.



Table 156: XA Positioner Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Distance Source to Detector	0018,1110	DS		ALWAYS	FIXED	-
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		ALWAYS	AUTO	-
Positioner Secondary Angle	0018,1511	DS		ALWAYS	FIXED	-
Positioner Primary Angle Increment	0018,1520	DS		ANAP	FIXED	Only present for 3D Acquisitions. 203 divided by the number of images in the run.
Positioner Secondary Angle Increment	0018,1521	DS	Value 1: 0	ANAP	FIXED	Only present for 3D Acquisitions.

Table 157: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	Required if expanded/replacement character set used.
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	

#### 9.1.1.4. X-Ray Radiation Dose SR

Table 158: IOD of Created X-Ray Radiation Dose SR Instances

Information Entity	Module	Presence Of Module
Patient	Patient Module	ALWAYS
Study	General Study Module	ALWAYS
Study	Patient Study Module	ALWAYS
Series	SR Document Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Document	SR Document General Module	ALWAYS
Document	SR Document Content Module	ALWAYS
Document	SOP Common Module	ALWAYS

Table 159: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Patient Sequence	0008,1120	SQ		VNAP	MWL	
> Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL	
> Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
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 Sex	0010,0040	CS	F, M, O	ALWAYS	MWL, USER	

Other Patient IDs	0010,1000	LO		VNAP	MWL	
Other Patient Names	0010,1001	PN		VNAP	MWL	

Table 160: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		ALWAYS	AUTO	<yyymmdd>
Study Time	0008,0030	TM		ALWAYS	AUTO	<hhmmss>
Accession Number	0008,0050	SH		ALWAYS	MWL, USER	
Referring Physician's Name	0008,0090	PN		VNAP	MWL	
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 Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	MWL	From Requested Procedure ID (0040,1001) of MWL.

Table 161: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ANAPCV	MWL	
Admitting Diagnoses Code Sequence	0008,1084	SQ		ANAPCV	MWL	
>Code Value	0008,0100	SH		ALWAYS	MWL	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	
>Code Meaning	0008,0104	LO		ALWAYS	MWL	
>Coding Scheme Version	0008,0103	SH		ANAP	MWL	
Patient's Weight	0010,1030	DS		VNAP	MWL, USER	

Table 162: SR Document Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Series Date	0008,0021	DA		ALWAYS	AUTO	
Series Time	0008,0031	TM		ALWAYS	AUTO	
Modality	0008,0060	CS	SR	ALWAYS	FIXED	
Series Description	0008,103E	LO		ALWAYS	CONFIG	Radiation Dose Information
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAPCV	COPY	If no associated Performed Procedure Step exists then the attribute remains empty.
>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	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	FIXED	Unique

Table 163: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips Medical Systems	ALWAYS	AUTO	"Philips Medical Systems".
Institution Name	0008,0080	LO		ANAP	AUTO	Hospital Name.

Station Name	0008,1010	SH		ALWAYS	CONFIG	
Manufacturer's Model Name	0008,1090	LO	"BV Pulsera", "BV Endura" or "Veradius"	ALWAYS	AUTO	"BV Endura", "BV Pulsera" or "Veradius" depending on the system type.
Device Serial Number	0018,1000	LO		ALWAYS	AUTO	Value comes from service setting.
Software Version(s)	0018,1020	LO	Value 1: PH Mobile C R3.4	ALWAYS	AUTO	

Table 164: SR Document General Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Time	0008,0033	TM		ALWAYS	AUTO	-
Instance Number	0020,0013	IS	0	ALWAYS	AUTO	0
Content Date	0008,0023	DA		ALWAYS	AUTO	-
Completion Flag	0040,A491	CS	COMPLETE	ALWAYS	FIXED	-
Verification Flag	0040,A493	CS	UNVERIFIED	ALWAYS	FIXED	-
Referenced Request Sequence	0040,A370	SQ		ANAP	MWL	-
>Requested Procedure Description	0032,1060	LO		VNAP	MWL	-
>Reason for the Requested Procedure	0040,1002	LO		ANAPCV	MWL	-
>Accession Number	0008,0050	SH		VNAP	MWL	-
>Study Instance UID	0020,000D	UI		ALWAYS	MWL	-
>Requested Procedure ID	0040,1001	SH		VNAP	MWL	-
>Placer Order Number / Imaging Service Request	0040,2016	LO		VNAP	MWL	-
>Filler Order Number / Imaging Service Request	0040,2017	LO		VNAP	MWL	-
>Reason for Requested Procedure Code Sequence	0040,100A	SQ		ANAPCV	MWL	This attribute is omitted if not configured at system installation
>>Code Value	0008,0100	SH		ALWAYS	MWL	This attribute is omitted if not configured at system installation
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	This attribute is omitted if not configured at system installation
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	This attribute is omitted if not configured at system installation
>>Coding Scheme Version	0008,0103	SH		ANAP	MWL	This attribute is omitted if not configured at system installation
>Requested Procedure Code Sequence	0032,1064	SQ		VNAP	MWL	-
>>Code Value	0008,0100	SH		ALWAYS	MWL	-
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	MWL	-
>>Code Meaning	0008,0104	LO		ALWAYS	MWL	-
>>Coding Scheme Version	0008,0103	SH		ANAP	MWL	-
>Referenced Study Sequence	0008,1110	SQ		VNAP	MWL	-
>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	MWL	-
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	MWL	-
Performed Procedure Code Sequence	0040,A372	SQ		EMPTY	AUTO	No Value and zero Value Length.

Table 165: SR Document Content Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Value Type	0040,A040	CS	CONTAINER	ALWAYS	FIXED	
Concept Name Code Sequence	0040,A043	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH	113701	ALWAYS	FIXED	

>Coding Scheme Designator	0008,0102	SH	DCM	ALWAYS	FIXED	
>Code Meaning	0008,0104	LO	X-ray radiation Dose Report	ALWAYS	FIXED	
Continuity Of Content	0040,A050	CS	SEPARATE	ALWAYS	FIXED	
Content Template Sequence	0040,A504	SQ		ALWAYS	AUTO	
>Mapping Resource	0008,0105	CS	DCMR	ALWAYS	FIXED	
>Template Identifier	0040,DB00	CS	TID 10001	ALWAYS	FIXED	
Content Sequence	0040,A730	SQ		ANAP	AUTO	
>Relationship Type	0040,A010	CS	HAS CONCEPT MOD	ALWAYS	FIXED	

Table 166: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	COPY	
Instance Creation Date	0008,0012	DA		ALWAYS	AUTO	
Instance Creation Time	0008,0013	TM		ALWAYS	AUTO	
SOP Class UID	0008,0016	UI	1.2.840.10008.5.1.4.1.1.88.67	ALWAYS	FIXED	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	

### 9.1.2. Usage of Attributes from Received IOD

Not applicable.

### 9.1.3. Attribute Mapping

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

Table 167: Attribute Mapping of the Mobile C-Arm AE

Attribute Name	MWL Tag	MPPS Create Tag	MPPS Set Tag	SC Tag	XA Tag	SR Tag
Specific Character Set (if present)	0008,0005	0008,0005	-	0008,0005	0008,0005	0040,A370 >0008,0005
Accession Number	0008,0050	(0040,0270) >(0008,0050)	-	0008,0050	0008,0050	0040,A370 >0008,0050
Referring Physician's Name	0008,0090	-	-	0008,0090	0008,0090	0008,0090
Referenced Study Sequence	0008,1110	(0040,0270) >(0008,1110)	-	0008,1110	0008,1110	0040,A370 >0008,1110
> Referenced SOP Class UID	>(0008,1150)	>(0008,1150)	-	>(0008,1150)	>(0008,1150)	>(0008,1150)
> Referenced SOP Instance UID	>(0008,1155)	>(0008,1155)	-	>(0008,1155)	>(0008,1155)	>(0008,1155)
Referenced Patient Sequence	(0008,1120)	(0008,1120)	-	-	-	0008,1120
> Referenced SOP Class UID	>(0008,1150)	>(0008,1150)	-	-	-	>0008,1150
> Referenced SOP Instance UID	>(0008,1155)	>(0008,1155)	-	-	-	>0008,1155
Patient's Name	0010,0010	0010,0010	-	0010,0010	0010,0010	0010,0010
Patient ID	0010,0020	0010,0020	-	0010,0020	0010,0020	0010,0020
Patient's Birth Date	0010,0030	0010,0030	-	0010,0030	0010,0030	0010,0030
Patient's Birth Time	0010,0032	-	-	0010,0032	0010,0032	0010,0032
Patient's Sex	0010,0040	0010,0040	-	0010,0040	0010,0040	0010,0040
Other Patient IDs	0010,1000	-	-	0010,1000	0010,1000	0010,1000
Other Patient Names	0010,1001	-	-	0010,1001	0010,1001	0010,1001
Patient's Weight	0010,1030	-	-	0010,1030	0010,1030	0010,1030
Study Instance UID	0020,000D	(0040,0270) >(0020,000D)	-	0020,000D	0020,000D	0040,A370 >0020,000D
Requested Procedure Description	0032,1060	(0040,0270) >(0032,1060)	-	(0040,0275) >(0032,1060)	(0040,0275) >(0032,1060)	0040,A370 >0032,1060

Attribute Name	MWL Tag	MPPS Create Tag	MPPS Set Tag	SC Tag	XA Tag	SR Tag
Reason for Requested Procedure	0040,1002	-	-	-	-	0040,A370 >0040,1002
Reason for Requested Procedure Code Sequence	0040,100A	-	-	-	-	0040,A370 >0040,100A
>Code Value	>0008,0100	-	-	-	-	>>0008,0100
>Coding Scheme Designator	>0008,0102	-	-	-	-	>>0008,0102
>Code Meaning	>0008,0104	-	-	-	-	>>0008,0104
>Coding Scheme Version	>0008,0103	-	-	-	-	>>0008,0103
>Scheduled Performing Physician's Name (Physician who makes the Examination)	(0040,0100) >(0040,0006)	-	(0040,0340) >(0008,1050)	(0008,1050)	(0008,1050)	-
>Scheduled Procedure Step Description	(0040,0100) >(0040,0007)	(0040,0270) >(0040,0007)	-	(0040,0275)	(0040,0275)	0008,1030
>Scheduled Procedure Step ID	(0040,0100) >(0040,0009)	(0040,0270)	-	(0040,0275)	(0040,0275)	-
	-	>(0040,0009)	-	>(0040,0009)	>(0040,0009)	-
> Scheduled Protocol Code Sequence	(0040,0100) >(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)	-
Requested Procedure ID	0040,1001	(0040,0270)	-	(0040,0275)	(0040,0275)	0040,A370 >0040,1001
	-	>(0040,1001), (0020,0010)	-	>(0040,1001), (0020,0010)	>(0040,1001), (0020,0010)	-
Performed Procedure Step ID	-	0040,0253	-	0040,0253	0040,0253	-
MPPS SOP Class UID	-	0000,0002	0000,0003	0008,1111 >0008,1150	0008,1111 >0008,1150	0008,1111 >0008,1150
MPPS SOP Instance UID	-	0000,1000	0000,1001	0008,1111 >0008,1155	0008,1111 >0008,1155	0008,1111 >0008,1155
Admitting Diagnoses Description	0008,1080	-	-	-	-	0008,1080
Admitting Diagnoses Code Sequence	0008,1084	-	-	0008,1084	0008,1084	0008,1084
>Code Value	>0008,0100	-	-	>0008,0100	>0008,0100	>0008,0100
>Coding Scheme Designator	>0008,0102	-	-	>0008,0102	>0008,0102	>0008,0102
>Code Meaning	>0008,0104	-	-	>0008,0104	>0008,0104	>0008,0104
>Coding Scheme Version	>0008,0103	-	-	>0008,0103	>0008,0103	>0008,0103
Scheduled Procedure Step Sequence	0040,0100	-	-	-	-	-
>Modality	>(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)	-	-	-
>Scheduled Station Name	>(0040,0010)	>(0040,0242)	-	0040,0010	0040,0010	-
Requested Procedure Code Sequence	(0032,1064)	(0008,1032)	-	(0008,1032)	(0008,1032)	(0040,A370) >(0032,1064)
>Code Value	>(0008,0100)	>(0008,0100)	-	>(0008,0100)	>(0008,0100)	>>(0008,0100)

Attribute Name	MWL Tag	MPPS Create Tag	MPPS Set Tag	SC Tag	XA Tag	SR Tag
>Coding Scheme Designator	>(0008,0102)	>(0008,0102)	-	>(0008,0102)	>(0008,0102)	>>(0008,0102)
>Coding Scheme Version	>(0008,0103)	>(0008,0103)	-	>(0008,0103)	>(0008,0103)	>>(0008,0103)
>Code Meaning	>(0008,0104)	>(0008,0104)	-	>(0008,0104)	>(0008,0104)	>>(0008,0104)
Placer Order Number/Imaging Service Request	(0040,2016)	-	-	-	-	(0040,A370) >(0040,2016)
Filler Order Number/Imaging Service Request	(0040,2017)	-	-	-	-	(0040,A370) >(0040,2017)

#### 9.1.4. 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.

## 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 BV Family can be calibrated by using the service tool together with a light probe. See the [VFRB] for details on the calibration procedure.

## 9.5. STRUCTURED REPORT DOCUMENT INFORMATIONS

### 9.5.1. Radiation Dose Structured Report

#### 9.5.1.1. TID 10001 Projection X-Ray Radiation Dose

Table 168: Projection X-Ray Radiation Dose

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		X-Ray Radiation Dose Report	1	ALWAYS	
>	HAS CONCEPT MOD	Procedure reported	1	ALWAYS	Projection X-Ray
>>	HAS CONCEPT MOD	Has Intent	1	ALWAYS	Diagnostic Intent
>		DTID (1002) Observer Context	1	ALWAYS	
>	HAS OBS CONTEXT	Scope of Accumulation	1	ALWAYS	Performed Procedure Step
>>	HAS PROPERTIES	DCID (10001) UID Types	1	ALWAYS	Performed Procedure Step SOP Instance UID When the system does not use MPPS, a UID will be used based on the examination timestamp.
>	CONTAINS	DTID (10002) Accumulated X-Ray Dose	1	ALWAYS	
>	CONTAINS	DTID (10003) Irradiation Event X-Ray Data	1-n	ALWAYS	
>	CONTAINS	Source of Dose Information	1	ALWAYS	Automated Data Collection

#### 9.5.1.2. TID 10002 Accumulated X-Ray Dose

Table 169: Accumulated X-Ray Dose

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		Accumulated X-Ray Dose Data	1	ALWAYS	
>	HAS CONCEPT MOD	Acquisition Plane	1	ALWAYS	Single Plane
>	CONTAINS	Calibration	1	ALWAYS	Values from service calibration
>>	HAS CONCEPT MOD	Dose Measurement Device	1	ALWAYS	Dosimeter
>>	CONTAINS	Calibration Date	1	ALWAYS	System date of last calibration
>>	CONTAINS	Calibration Factor	1	ALWAYS	1
>>	CONTAINS	Calibration Uncertainty	1	ALWAYS	35%
>>	CONTAINS	Calibration Responsible Party	1	ALWAYS	Party responsible for servicing the device
>	CONTAINS	DTID (10004) Accumulated Projection X-Ray Dose	1	ALWAYS	

## 9.5.1.3. TID 10003 Irradiation Event X-Ray Data

Table 170: Irradiation Event X-Ray Data

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		Irradiation Event X-Ray Data	1	ALWAYS	
>	HAS CONCEPT MOD	Acquisition Plane	1	ALWAYS	Single Plane
>	CONTAINS	DateTime Started	1	ALWAYS	
>	CONTAINS	Irradiation Event Type	1	ALWAYS	Stationary Acquisition (for digital exposure and Radiography) Rotational Acquisition (for 3D runs) Fluoroscopy (for all other runs)
>	CONTAINS	Acquisition Protocol	1	CONDITIONAL	Copy from series module when available.
>	CONTAINS	Reference Point Definition	1	ALWAYS	30cm in Front of Image Input Surface
>	CONTAINS	Irradiation Event UID	1	ALWAYS	
>	CONTAINS	Dose Area Product	1	ALWAYS	Dose area product.
>	CONTAINS	Dose (RP)	1	ALWAYS	Dose at the dose reference point.
>	CONTAINS	Positioner Primary Angle	1	CONDITIONAL	Only for 3D acquisitions: start angle
>	CONTAINS	Positioner Secondary Angle	1	CONDITIONAL	Only for 3D acquisitions: 0 deg
>	CONTAINS	Positioner Primary End Angle	1	CONDITIONAL	Only for 3D acquisitions: stop angle
>	CONTAINS	Positioner Secondary End Angle	1	CONDITIONAL	Only for 3D acquisitions: 0 deg
>	CONTAINS	Collimated Field Area	1	ALWAYS	Collimator area at detector plane
>	CONTAINS	X-Ray Filters	2	ALWAYS	List of all fixed pre-filters in the system
>	CONTAINS	Irradiation Duration	1	ALWAYS	Time in seconds
>	CONTAINS	DCID (10008) Dose Related Distance Measurements	2	ALWAYS	Fill in fixed values for: - Distance source to reference point - Distance source to detector
>	CONTAINS	Target Region	1	ALWAYS	One of the list below can be selected by the user. - Abdomen - Chest - Chest, Abdomen and Pelvis - Entire body - Extremity - Head - Hip joint - Spine
>	CONTAINS	Anode Target Material	1	ALWAYS	Tungsten or Tungsten compound
>	CONTAINS	X-Ray Grid	1	ALWAYS	Focused grid



>	CONTAINS	DTID (1020) Person Participant	1	ALWAYS	
>	CONTAINS	DTID (1021) Device Participant	1	ALWAYS	Irradiating Device

Note that the number of irradiation events in an exported dose structured report message is limited to 1000.

#### 9.5.1.4. TID 10004 Accumulated Projection X-Ray Dose

Table 171: Accumulated Projection X-Ray Dose

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		Dose Area Product Total	1	ALWAYS	Gym2
		Dose (RP) Total	1	ALWAYS	Gy
		Fluoro Dose Area Product Total	1	CONDITIONAL	Gym2
		Fluoro Dose (RP) Total	1	CONDITIONAL	Gy
		Total Fluoro Time	1	CONDITIONAL	Time in seconds
		Acquisition Dose Area Product Total	1	ALWAYS	The dose administered for Digital Exposures & Radiography.
		Acquisition Dose (RP) Total	1	ALWAYS	The dose administered for Digital Exposures & Radiography.
		Total Acquisition Time	1	ALWAYS	Time in seconds
		Total Number of Radiographic Frames	1	CONDITIONAL	no units
		Reference Point Definition	1	ALWAYS	30cm in Front of Image Input Surface

#### 9.5.1.5. TID 1002 Observer Context

Table 172: Observer Context

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
	HAS OBS CONTEXT	Observer Type	1	CONDITIONAL	Device
	HAS OBS CONTEXT	DTID (1004) Device observer identifying attributes	1	ALWAYS	

#### 9.5.1.6. TID 1004 Device Observer Identifying Attributes

Table 173: Device Observer Identifying Attributes

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		Device Observer UID	1	ALWAYS	Based on the Device Serial Number (0018, 1000)
		Device Observer Name	1	CONDITIONAL	Station Name (0008, 1010)

		Device Observer Manufacturer	1	CONDITIONAL	Manufacturer (0008,0070)
		Device Observer Model Name	1	CONDITIONAL	Manufacturer's Model Name (0008,1090)
		Device Observer Serial Number	1	CONDITIONAL	Device Serial Number (0018,1000)

#### 9.5.1.7. TID 1020 Person Participant

Table 174: Person Participant

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		Person Name	1	ALWAYS	<ul style="list-style-type: none"> <li>- Performing Physician's Name (0008,1050)</li> <li>- Physician's name as entered in the system for the examination.</li> <li>- Operator's Name (0008,1070)</li> <li>- Operator's Name as entered in the system for the examination.</li> <li>- First available value from the list is used.</li> </ul>
>	HAS PROPERTIES	Person Role in Procedure	1	ALWAYS	Irradiation Administering.

#### 9.5.1.8. TID 1021 Device Participant

Table 175: Device Participant

NL	Relation with Parent	Concept Name	VM	Presence of Value	Value
		Device Role in Procedure	1	ALWAYS	Irradiation Device
>	HAS PROPERTIES	Device Name	1	CONDITIONAL	Use the Station name (0008,1010)
>	HAS PROPERTIES	Device Manufacturer	1	ALWAYS	Manufacturer (0008,0070)
>	HAS PROPERTIES	Device Model Name	1	ALWAYS	"BV Endura". "BV Pulsera", "Veradius", depending on system type.
>	HAS PROPERTIES	Device Serial Number	1	ALWAYS	Device Serial Number (0018,1000)

## 9.6. Private Transfer Syntaxes

Not applicable.

## 10. Annexes of application "ViewForum Surgical Workstation AE"

### 10.1. IOD Contents

#### 10.1.1. Created SOP Instance

This section specifies each created IOD by this application.

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

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

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

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

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

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

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

##### 10.1.1.1. List of created SOP Classes

**Table 176: 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

##### 10.1.1.2. Secondary Capture Image Storage SOP Class

**Table 177: 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
Study	Patient Study Module	CONDITIONAL
Series	General Series Module	ALWAYS

Equipment	General Equipment Module	CONDITIONAL
Equipment	SC Equipment Module	ALWAYS
Image	General Image Module	ALWAYS
Image	Image Pixel Module	ALWAYS
Image	SC Image Module	ALWAYS
Image	Overlay Plane Module	CONDITIONAL
Image	Modality LUT Module	CONDITIONAL
Image	VOI LUT Module	CONDITIONAL
Image	SOP Common Module	ALWAYS

Table 178: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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	
Patient's Name	0010,0010	PN		ALWAYS	MWL, USER	
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		VNAP	AUTO	<hhmm> From GUI.
Patient's Sex	0010,0040	CS	F, M, O	VNAP	AUTO, USER	
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, USER	From GUI.

Table 179: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	AUTO	<yyyymmdd>
Study Time	0008,0030	TM		VNAP	AUTO	<hhmmss>
Accession Number	0008,0050	SH		VNAP	AUTO, USER	From GUI.
Referring Physician's Name	0008,0090	PN		VNAP	AUTO, USER	From GUI.
Study Description	0008,1030	LO		ANAP	AUTO, USER	From GUI.
Procedure Code Sequence	0008,1032	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		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	
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 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	
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study ID	0020,0010	SH		VNAP	MWL	

Table 180: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Admitting Diagnoses Description	0008,1080	LO		ANAP	AUTO, USER	From GUI.
Admitting Diagnoses Code Sequence	0008,1084	SQ		ANAP	AUTO, USER	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		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	
Patient's Age	0010,1010	AS		ANAP	AUTO	From GUI.
Patient's Size	0010,1020	DS		ANAP	AUTO	
Patient's Weight	0010,1030	DS		ANAP	AUTO	
Occupation	0010,2180	SH		ANAP	AUTO, USER	From GUI.
Additional Patient History	0010,21B0	LT		ANAP	AUTO, USER	From GUI

Table 181: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
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, USER	
Operators' Name	0008,1070	PN		ANAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Body Part Examined	0018,0015	CS		ANAP	AUTO	
Protocol Name	0018,1030	LO		ANAP	AUTO, USER	

Patient Position	0018,5100	CS		ANAPCV	AUTO	
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Laterality	0020,0060	CS		EMPTY	FIXED	
Smallest Pixel Value in Series	0028,0108	US /SS		ANAP	AUTO	
Largest Pixel Value in Series	0028,0109	US /SS		ANAP	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 Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		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		ANAP		
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, USER	From GUI.
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		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.

Table 182: General Equipment Module

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

Institution Name	0008,0080	LO		ANAP	CONFIG	
Station Name	0008,1010	SH		ALWAYS	CONFIG	
Institutional Department Name	0008,1040	LO		ANAP	AUTO	
Manufacturer's Model Name	0008,1090	LO		ALWAYS	AUTO	
Device Serial Number	0018,1000	LO		ANAP	AUTO	
Software Version(s)	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	

Table 183: SC Equipment Module

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

Table 184: General Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	Value 1: DERIVED, Value 2: SECONDARY	ALWAYS	AUTO	
Acquisition Date	0008,0022	DA		ANAP	AUTO	
Content Date	0008,0023	DA		ALWAYS	AUTO	<yyyymmdd>
Acquisition Datetime	0008,002A	DT		ANAP	AUTO	
Acquisition Time	0008,0032	TM		ANAP	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	<hhmmss>
Referenced Image Sequence	0008,1140	SQ		ANAP	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		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	
>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Derivation Description	0008,2111	ST		ANAP	AUTO	
Source Image Sequence	0008,2112	SQ		ANAP	AUTO	
>Purpose of Reference Code Sequence	0040,A170	SQ		ANAP	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	

>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		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	
>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
Derivation Code Sequence	0008,9215	SQ		ANAP	AUTO	
>Code Value	0008,0100	SH		ALWAYS	AUTO	
>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>Coding Scheme Version	0008,0103	SH		ALWAYS	AUTO	
>Code Meaning	0008,0104	LO		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	0088,0050	SQ		ANAP	AUTO	
>Slice Thickness	0018,0050	DS		ALWAYS	AUTO	
>Slice Location	0020,1041	DS		ALWAYS	AUTO	
>Pixel Spacing	0028,0030	DS		ALWAYS	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	

Table 185: 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	
Rows	0028,0010	US	1024	ALWAYS	AUTO	
Columns	0028,0011	US	1024	ALWAYS	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 Representation	0028,0103	US	0	ALWAYS	AUTO	
Smallest Image Pixel Value	0028,0106	US /SS		ANAP	AUTO	
Largest Image Pixel Value	0028,0107	US /SS		ANAP	AUTO	
Red Palette Color Lookup Table Descriptor	0028,1101	US /SS		ANAP	AUTO	
Green Palette Color Lookup Table Descriptor	0028,1102	US /SS		ANAP	AUTO	
Blue Palette Color Lookup Table Descriptor	0028,1103	US /SS		ANAP	AUTO	
Red Palette Color Lookup Table Data	0028,1201	O W		ANAP	AUTO	
Green Palette Color Lookup Table Data	0028,1202	O W		ANAP	AUTO	
Blue Palette Color Lookup Table Data	0028,1203	O W		ANAP	AUTO	
Pixel Data	7FE0,0010	O W/ OB		ALWAYS	AUTO	

Table 186: 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 187: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	6000,0010	US		ALWAYS	AUTO	
Overlay Columns	6000,0011	US		ALWAYS	AUTO	
Overlay Description	6000,0022	LO		ANAP	AUTO	
Overlay Type	6000,0040	CS		ALWAYS	AUTO	
Overlay Subtype	6000,0045	LO		ANAP	AUTO	
Overlay Origin	6000,0050	SS		ALWAYS	AUTO	
Overlay Bits Allocated	6000,0100	US		ALWAYS	AUTO	
Overlay Bit Position	6000,0102	US		ALWAYS	AUTO	
ROI Area	6000,1301	IS		ANAP	AUTO	
ROI Mean	6000,1302	DS		ANAP	AUTO	
ROI Standard Deviation	6000,1303	DS		ANAP	AUTO	
Overlay Label	6000,1500	LO		ANAP	AUTO	
Overlay Data	6000,3000	O W/ OB		ALWAYS	AUTO	

Table 188: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ANAP	AUTO	

Rescale Slope	0028,1053	DS		ANAP	AUTO	
Modality LUT Sequence	0028,3000	SQ		ANAP	AUTO	
>LUT Descriptor	0028,3002	US /SS		ALWAYS	AUTO	
>LUT Explanation	0028,3003	LO		ANAP	AUTO	
>Modality LUT Type	0028,3004	LO		ALWAYS	AUTO	
>LUT Data	0028,3006	US /O W		ALWAYS	AUTO	

Table 189: VOI LUT Module

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

Table 190: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS	ISO_IR 100	ALWAYS	AUTO	Required if expanded/replacement character set used.
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	

### 10.1.1.3. Grayscale Softcopy Presentation State Storage SOP Class

Table 191: IOD of Created Grayscale Softcopy Presentation State Storage SOP Class Instances

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

Table 192: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		ALWAYS	MPPS, USER	
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 Sex	0010,0040	CS	F, M, O	VNAP	AUTO, USER	

Table 193: 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	
Study ID	0020,0010	SH		VNAP	COPY	

Table 194: 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	<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 195: Presentation Series Module

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

Table 196: 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 197: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	Current date.
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	Current time.

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	
Content Creator's Name	0070,0084	PN	"Surgical user"	ALWAYS	AUTO	

**Table 198: 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 199: Presentation State Shutter Module**

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

**Table 200: 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 201: 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 202: 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	
>Window Center	0028,1050	DS		ANAP	AUTO	
>Window Width	0028,1051	DS		ANAP	AUTO	
>Window Center & Width Explanation	0028,1055	LO		ANAPCV	AUTO	
>VOI LUT Sequence	0028,3010	SQ		ANAP	COPY	
>>LUT Descriptor	0028,3002	US /SS		ALWAYS	COPY	

>>LUT Explanation	0028,3003	LO		ANAPCV	COPY	
>>LUT Data	0028,3006	US /O W		ALWAYS	COPY	

Table 203: 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	US /SS		ALWAYS	AUTO	
>LUT Data	0028,3006	US /O W		ALWAYS	AUTO	

Table 204: SOP Common 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	

### 10.1.2. Usage of Attributes from Received IOD

None.

### 10.1.3. Attribute Mapping

Not applicable.

### 10.1.4. 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 205: 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 206: Omitted Attributes for Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source
<b>Patient Module</b>					
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
<b>General Study Module</b>					
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
<b>Patient Study Module</b>					
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
Patient's Weight	0010,1030	DS		ANAP	AUTO
Occupation	0010,2180	SH		ANAP	AUTO
Additional Patient History	0010,21B0	LT		ANAP	AUTO
<b>Clinical Trial Study Module</b>					
Clinical Trial Time Point Description	0012,0051	DA		ANAP	AUTO
<b>General Series Module</b>					
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
<b>General Equipment Module</b>					

Attribute Name	Tag	VR	Value	Presence of Value	Source
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
<b>Display Shutter Module</b>					
Shutter Presentation Value	0018,1622	US		ANAP	AUTO
<b>Overlay Plane Module</b>					
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
<b>SOP Common Module</b>					
Instance Creation Date	0008,0012	DA		ANAP	AUTO
Instance Creation Time	0008,0013	TM		ANAP	AUTO
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 207: Cleared Attributes for Image Storage

Attribute Name	Tag	VR	Value	Presence of Value	Source
<b>Patient Module</b>					
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
<b>Clinical Trial Subject Module</b>					
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
<b>General Study Module</b>					
Study Date	0008,0020	DA		VNAP	AUTO
Study Time	0008,0030	TM		VNAP	AUTO

Attribute Name	Tag	VR	Value	Presence of Value	Source
Accession Number	0008,0050	SH		VNAP	AUTO
Referring Physician's Name	0008,0090	PN		VNAP	AUTO
Study ID	0020,0010	SH		VNAP	AUTO
<b>Clinical Trial Study Module</b>					
Clinical Trial Time Point ID	0012,0050	LO		VNAP	AUTO
<b>General Series Module</b>					
Patient Position	0018,5100	CS		ANAPCV	AUTO
Series Number	0020,0011	IS		VNAP	AUTO
Laterality	0020,0060	CS		ANAPCV	AUTO
<b>Clinical Trial Series Module</b>					
Clinical Trial Coordinating Center Name	0012,0060	LO		VNAP	AUTO
<b>General Equipment Module</b>					
Manufacturer	0008,0070	LO		VNAP	AUTO
<b>Mask Module</b>					
Recommended Viewing Mode	0028,1090	CS		VNAP	AUTO
<b>Overlay/Curve Activation Module</b>					
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 208: Modifiable Attributes**

Attribute Name	Tag	VR	Value	Presence of Value	Source
<b>Patient</b>					
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
<b>Study</b>					
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
<b>Examination</b>					
Performed Station Name	0040,0242	SH		An institution defined name for the modality on which the Performed Procedure Step was performed.	CONF, MPPS, USER



Attribute Name	Tag	VR	Value	Presence of Value	Source
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

## 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

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.

## 10.5. Standard Extended/Specialized/Private SOPs

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

**Table 209: 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

SOP Class Name	SOP Class UID
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 210: 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

## 10.5.1. Standard Extended/Specialized/Private SOP Instance

### 10.5.1.1. Secondary Capture Image Storage SOP Class

Table 211: Extended DICOM 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.

## 10.6. Private Transfer Syntaxes

Not applicable.