

DICOM Conformance Statement

IntelliSpace Radiology 4.7



Issued by:

Philips Medical Systems Nederland BV, a Philips Healthcare company,

P.O. Box 10.000
5680 DA Best
The Netherlands

Internet: <https://www.philips.com/healthcare/about/customer-support>

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1. DICOM Conformance Statement Overview

IntelliSpace Radiology is a software package intended to be used by trained professionals, including but not limited to physicians, administrators and medical technicians. The software is used with general purpose computing hardware for the presentation, processing, measurement and distribution of images and associated data throughout a clinical environment. IntelliSpace Radiology software supports printing and displaying studies received from the following modality types via DICOM: CT, MR, NM, US, XA, PET, CR, DX, DR, RF, RT, MG, SC, VL, and OP as well as hospital/radiology information systems. IntelliSpace Radiology contains an Advanced Mammography module for functionality specific to Mammography. Lossy compressed mammographic images and digitized film/screen images must not be reviewed for primary image interpretations.

Table 1: Network Services

SOP Class		User of Service (SCU)	Provider of Service (SCP)	Display
Name	UID			
Print Management				
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No	N/A
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No	N/A
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No	N/A
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No	N/A
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No	N/A
Stored Print Storage	1.2.840.10008.5.1.1.27	Yes	No	N/A
Other				
Verification SOP Class	1.2.840.10008.1.1	Yes	No	N/A

Table 2: Supported IODs

SOP Class		ACCEPTED	CREATED	DISPLAY
Name	UID			
Computed Radiography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.1	Yes	No	Yes
Digital X-Ray Image Storage - For Pres. SOP	1.2.840.10008.5.1.4.1.1.1.1	Yes	No	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	No	Yes
Digital X-Ray Image Storage - For Proc. SOP	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	No	No
Digital Mammography X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.2	Yes	No	Yes
Digital Mammography X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	No	No
Digital Intra-oral X-Ray Image Storage - Pres. SOP	1.2.840.10008.5.1.4.1.1.1.3	Yes	No	Yes
Digital Intra-oral X-Ray Image Storage - Proc. SOP	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	No	No
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	No	No
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes	Yes
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes	Yes
X-Ray Angiographic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.1	Yes	No	Yes
X-Ray Radiofluoroscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.12.2	Yes	No	Yes
X-Ray Angiographic Bi-Plane Image Storage SOP Class (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	No	Yes
Positron Emission Tomography Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.128	Yes	No	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	Yes	Yes	Yes
Breast Projection X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.13.1.4	Yes	No	Yes
Breast Projection X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.13.1.5	Yes	No	Yes
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	Yes	No	No
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Yes	No	No

SOP Class		ACCEPTED	CREATED	DISPLAY
Name	UID			
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	Yes	No	No
CT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.2	Yes	No	Yes
Nuclear Medicine Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.20	Yes	No	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No	Yes
Ultrasound Multi-frame Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.3.1	Yes	No	Yes
MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4	Yes	No	Yes
Enhanced MR Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.4.1	Yes	No	Yes
RT Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.1	Yes	No	Yes
RT Dose Storage SOP Class	1.2.840.10008.5.1.4.1.1.481.2	Yes	No	No
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	No	No
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	No	No
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	No	No
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	No	No
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	No	No
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	Yes	No	No
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	Yes	No	No
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	No	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	No	Yes
Ultrasound Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.6.1	Yes	No	Yes
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	Yes	No	Yes
Multi-frame Single Bit Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.1	Yes	No	Yes
Multi-frame Grayscale Byte SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.2	Yes	No	Yes
Multi-frame Grayscale Word SC Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7.3	Yes	No	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No	Yes
VL Endoscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No	Yes
VL Microscopic Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No	Yes
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No	Yes
Ophthalmic Photography 8 Bit Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	No	Yes
Ophthalmic Photography 16 Bit Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	No	Yes
Basic Text SR SOP Class	1.2.840.10008.5.1.4.1.1.88.11	Yes	No	Yes
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	Yes	No	Yes
Mammography CAD SR SOP Class	1.2.840.10008.5.1.4.1.1.88.50	Yes	No	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes	Yes
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	Yes	No	Yes
Enhanced SR SOP class	1.2.840.10008.5.1.4.1.1.88.22	Yes	No	Yes
Comprehensive SR SOP class	1.2.840.10008.5.1.4.1.1.88.33	Yes	No	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	No	No
Detail Storage Structured Reporting (Draft)	1.2.840.10008.5.1.4.1.1.88.3	Yes	No	No
Philips XRay specialized object	1.3.46.670589.2.3.1.1	Yes	No	Yes
Philips CX image	1.3.46.670589.2.4.1.1	Yes	No	No
Philips private presentation state for NEO	1.3.46.670589.2.5.1.1	Yes	No	No
Philips Private EasyVision Volume Storage	1.3.46.670589.5.0.1	Yes	No	No
MIT ViewForum Volume object	1.3.46.670589.5.0.1.1	Yes	No	No
MIT ViewForum MR Synthetic object	1.3.46.670589.5.0.10	Yes	No	No
Philips Private EasyVision MR Cardio Analysis Storage	1.3.46.670589.5.0.11	Yes	No	No
MIT ViewForum MR Cardio analysis object	1.3.46.670589.5.0.11.1	Yes	No	No

SOP Class		ACCEPTED	CREATED	DISPLAY
Name	UID			
MIT ViewForum CX Synthetic object	1.3.46.670589.5.0.12	Yes	No	No
Philips Private MR Spectrum Storage	1.3.46.670589.11.0.0.12.1	Yes	No	No
Philips Private MR Series Data Storage	1.3.46.670589.11.0.0.12.2	Yes	No	No
MIT ViewForum Perfusion object	1.3.46.670589.5.0.13	Yes	No	No
MIT ViewForum Perfusion analysis object	1.3.46.670589.5.0.14	Yes	No	No
Philips Private EasyVision 3D Volume Object Storage	1.3.46.670589.5.0.2	Yes	No	No
MIT ViewForum 3D Volume object	1.3.46.670589.5.0.2.1	Yes	No	No
Philips Private EasyVision Surface Storage	1.3.46.670589.5.0.3	Yes	No	No
MIT ViewForum Surface object	1.3.46.670589.5.0.3.1	Yes	No	No
Philips Private MR Cardio Profile Image Storage	1.3.46.670589.5.0.7	Yes	No	No
Philips Private EasyVision MR Cardio Storage	1.3.46.670589.5.0.8	Yes	No	No
MIT ViewForum Cardio object	1.3.46.670589.5.0.8.1	Yes	No	No
MIT ViewForum CT Synthetic object	1.3.46.670589.5.0.9	Yes	No	No
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Yes	No	No
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	No	No

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

Table 3: Media Services

Write Files (FSC)	Read Files (FSR)	Update Files (FSU)
Yes	No	No

The media service will export any DICOM SOP Class (see the above table the Section of the SOP Classes of transfer type) that IntelliSpace Radiology is supporting.

The Transfer Syntaxes for the exporting on media will be:

1. The following transfers syntaxes received on the network are preserved for the media exchange:

JPEG_BASELINE (Process 1)	1.2.840.10008.1.2.4.50
JPEG_EXTENDED (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG_2000 Image Compression	1.2.840.10008.1.2.4.91

2. The following transfer syntaxes received over the network are exchanged on the media with the Explicit Little Endian transfer syntax:

JPEG_LOSSLESS_ Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG_2000_LOSSLESS_ONLY	1.2.840.10008.1.2.4.90
RLE Lossless	1.2.840.10008.1.2.5

In addition, the SOP Classes created by the IntelliSpace Radiology (GSPS and Encapsulated PDF) will be exchanged on the media with the default transfer syntax: Explicit Little Endian. The Encapsulated PDF SOP Class will be created by IntelliSpace Radiology AE only for the purpose of exporting the Radiology Report (received in HL7 ORU message) on Media. For more details on the Created Encapsulated PDF SOP Class, see Chapter 8.

2. Table of Contents

1.	DICOM CONFORMANCE STATEMENT OVERVIEW	3
2.	TABLE OF CONTENTS	6
3.	INTRODUCTION	8
3.1.	REVISION HISTORY	8
3.2.	AUDIENCE	8
3.3.	REMARKS	8
3.4.	DEFINITIONS, TERMS AND ABBREVIATIONS.....	9
3.5.	REFERENCES.....	9
4.	NETWORKING	10
4.1.	IMPLEMENTATION MODEL	10
4.1.1.	Application Data Flow.....	10
4.1.2.	Functional Definition of AE's	10
4.1.2.1.	Functional Definition of IntelliSpace Radiology AE	10
4.1.3.	Sequencing of Real World Activities	11
4.2.	AE SPECIFICATIONS	11
4.2.1.	IntelliSpace Radiology AE	11
4.2.1.1.	SOP Classes	11
4.2.1.2.	Association Policies	11
4.2.1.2.1.	General.....	11
4.2.1.2.2.	Number of Associations	11
4.2.1.2.3.	Asynchronous Nature	12
4.2.1.2.4.	Implementation Identifying Information	12
4.2.1.2.5.	Communication Failure Handling.....	12
4.2.1.3.	Association Initiation Policy	12
4.2.1.3.1.	(Real-World) Activity – Verification as SCU	13
4.2.1.3.2.	(Real-World) Activity – Print Management as SCU.....	14
4.2.1.4.	Association Acceptance Policy	19
4.3.	NETWORK INTERFACES.....	20
4.3.1.	Physical Network Interfaces	20
4.3.2.	Additional Protocols	20
4.4.	CONFIGURATION	21
4.4.1.	AE Title/Presentation Address Mapping.....	21
4.4.1.1.	Local AE Titles.....	21
4.4.1.2.	Remote AE Title/Presentation Address Mapping.....	21
4.4.2.	Parameters.....	21
5.	MEDIA INTERCHANGE	22
5.1.	IMPLEMENTATION MODEL	22
5.1.1.	Application Data Flow Diagram	22
5.1.2.	Functional Definitions of AE's.....	22
5.1.2.1.	Functional Definition of Media-Manager Application Entity.....	22
5.1.3.	Sequencing of Real World Activities	22
5.1.4.	File Meta Information Options	22
5.2.	AE SPECIFICATIONS	22
5.2.1.	Functional Definition of Media-Manager Application Entity	23
5.2.2.	Sequencing of Real World Activities	23
5.2.3.	Media - Specification	23
5.2.3.1.	File Meta Information for the media	23
5.3.	EXPORTING DICOM SOP CLASSES ON MEDIA.....	23
5.3.1.	BSN Patient Identifier Support on Media.....	23
5.4.	AUGMENTED AND PRIVATE APPLICATION PROFILES.....	24
5.5.	MEDIA CONFIGURATION	24
6.	SUPPORT OF CHARACTER SETS.....	25

7.	SECURITY	26
7.1.	SECURITY PROFILES	26
7.1.1.	Security use Profiles	26
7.1.2.	Security Transport Connection Profiles	26
7.1.3.	Digital Signature Profiles	27
7.1.4.	Media Storage Security Profiles	27
7.1.5.	Attribute Confidentiality Profiles	27
7.1.6.	Network Address Management Profiles	32
7.1.7.	Time Synchronization Profiles	32
7.1.8.	Application Configuration Management Profiles.....	32
7.1.9.	Audit Trail Profiles	32
7.2.	ASSOCIATION LEVEL SECURITY	32
7.3.	APPLICATION LEVEL SECURITY	32
8.	ANNEXES OF APPLICATION "INTELLISPACE RADIOLOGY AE"	33
8.1.	IOD CONTENTS	33
8.1.1.	Created SOP Instance	33
8.1.1.1.	List of created SOP Classes	33
8.1.1.2.	Grayscale Softcopy Presentation State Storage SOP Class	34
8.1.1.3.	Encapsulated PDF Storage SOP Class	39
8.1.1.4.	Breast Tomosynthesis Image Storage SOP Class	41
8.1.1.5.	Key Object Selection Document Storage SOP Class	49
8.1.2.	Usage of Attributes from Received IOD	52
8.1.2.1.	IntelliSpace Radiology Viewer	52
8.1.2.1.1.	Limitation for Softcopy Presentation State Storage SOP Class	52
8.1.3.	Attribute Mapping	53
8.1.4.	Coerced/Modified fields.....	53
8.2.	DATA DICTIONARY OF PRIVATE ATTRIBUTES	53
8.3.	CODED TERMINOLOGY AND TEMPLATES	55
8.3.1.	Context Groups	55
8.3.2.	Template Specifications	55
8.3.3.	Private code definitions	55
8.4.	GRAYSCALE IMAGE CONSISTENCY	55
8.5.	STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS	55
8.5.1.	Standard Extended SOP's	55
8.5.2.	Standard Specialized SOP's	57
8.5.3.	Private SOP's.....	57
8.6.	PRIVATE TRANSFER SYNTAXES	57

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 4: Revision History

Document Version	Date of Issue	Description of change
00	05-Mar-2020	Final version

3.2. Audience

This Conformance Statement is intended for:

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

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

3.3. Remarks

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

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

- **Interoperability**
Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into an IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.
- **Validation**
Philips equipment has been carefully tested to ensure 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 5: Definitions, Terms and Abbreviations

Abbreviation/Term	Explanation
AE	Application Entity
CD	Compact Disc
CD-R	CD-Recordable
CD-M	CD-Medical
CR	Computed Radiography
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DIMSE-Composite
DIMSE-N	DIMSE-Normalized
DX	Digital X-Ray
EBE	DICOM Explicit VR Big Endian
ELE	DICOM Explicit VR Little Endian
FSC	File-set Creator
FSR	File-set Reader
FSU	File-set Updater
HIS	Hospital Information System
HL7	Health Level Seven
ILE	DICOM Implicit VR Little Endian
IOD	Information Object Definition
MR	Magnetic Resonance
NEMA	National Electrical Manufacturers Association
NM	Nuclear Medicine
PDU	Protocol Data Unit
RF	X-Ray Radiofluoroscopic
RIS	Radiology Information System
RT	Radiotherapy
RWA	Real-World Activity
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
USMF	Ultrasound Multi-frame
XA	X-Ray Angiographic

3.5. References

[DICOM] Digital Imaging and Communications in Medicine, Parts 1 - 22 (NEMA PS 3.1- PS 3.22),

National Electrical Manufacturers Association

1300 North 17th Street Suite 900

Arlington, Virginia 22209

Internet: <https://www.dicomstandard.org/current>

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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

IntelliSpace Radiology is a viewing and computing, presentation, processing, measurement and distribution of images and associated data throughout a clinical environment.

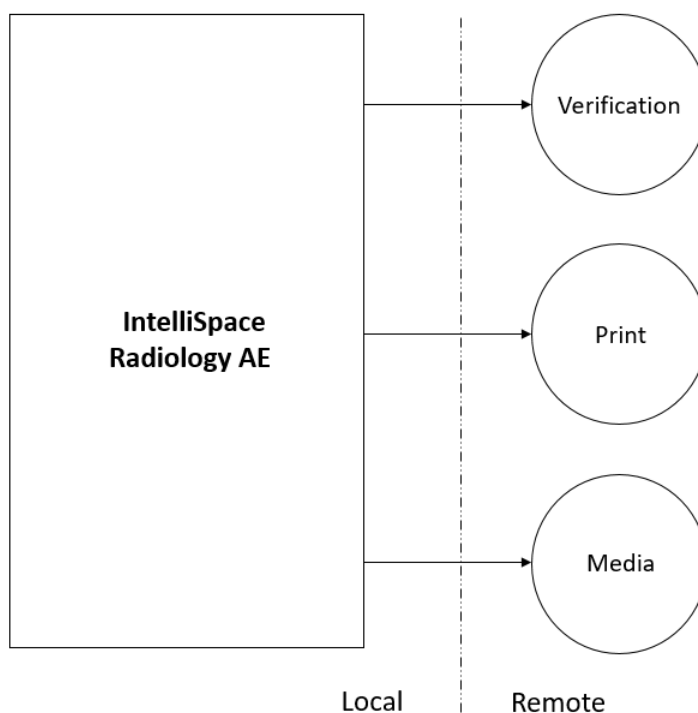


Figure 1: Application Data Flow Diagram

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 IntelliSpace Radiology AE

The IntelliSpace Radiology is the Image Display Viewer and provides the UI to perform the DICOM Query & Retrieve SCU (iQuery) to Query and Retrieve images from the IntelliSpace Universal Data Manager (UDM) server. In addition the IntelliSpace Radiology supports the export of DICOM Study on Removable media CD/DVD in DICOM Part 10 format with DICOMDIR. Furthermore the AE also supports the DICOM Print SCU. The IntelliSpace Radiology AE will initiate DICOM associations for DICOM Printing services on an as needed basis dependent upon interactive requests from users of the system.

When user invokes a print job and the SCU uses the SOP classes of a film session, a film box and image boxes for acquiring all the information which is required for a film session, the N-ACTION is used to print the film session. The DIMSE services of the Printer SOP Class and the Print Job SOP Class allow the SCU to control the print jobs and printer status information of the SCP.

4.1.3. Sequencing of Real World Activities

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. IntelliSpace Radiology 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 6: SOP Classes for IntelliSpace Radiology AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
>Basic Film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
>Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

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

4.2.1.2. Association Policies

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

4.2.1.2.1. General

The IntelliSpace Radiology will initiate DICOM associations for the DICOM Basic Printing Service and the DICOM Verification Service. The IntelliSpace Radiology application supports a maximum PDU size of 28K.

The DICOM standard application context is specified as follows:

Table 7: 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 IntelliSpace Radiology application only initiates a single association at a time for the DICOM Basic Printing Service.

4.2.1.2.3. Asynchronous Nature

The IntelliSpace Radiology application does not request multiple outstanding transactions over the same association.

4.2.1.2.4. Implementation Identifying Information

The value supplied for Implementation Class UID and version name are as follows:

Table 8: DICOM Implementation Class and Version for IntelliSpace Radiology AE

Description	Value
Implementation Class UID	1.3.46.670589.42.1.4.4.5
Implementation Version Name	PHISUDM3100

4.2.1.2.5. Communication Failure Handling

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

Table 9: Communication Failure Behavior

Exception	Behavior
ARTIM Time-out	The Association is aborted using AP-ABORT and command marked as failed. The reason is logged and reported to the user.

4.2.1.3. Association Initiation Policy

The Application Entity will respond on a received reject Association attempt as shown in the following table:

Table 10: Association Rejection response

Result	Source	Reason/Diagnosis	Explanation
1 - rejected-permanent	1 - DICOM UL service-user	1 - no-reason-given	IntelliSpace Radiology displays the error message
		2 - application-context-name-not-supported	IntelliSpace Radiology displays the error message
		3 - calling-AE-title-not-recognized	No association accomplished - error in log
		7 - called-AE-title-not-recognized	IntelliSpace Radiology displays the error message
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	IntelliSpace Radiology displays the error message
		2 - protocol-version-not-supported	IntelliSpace Radiology displays the error message
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary-congestion	IntelliSpace Radiology displays the error message
2 - Local-limit-exceeded		IntelliSpace Radiology displays the error message	
2 - rejected-transient	1 - DICOM UL service-user	1 - no-reason-given	No association accomplished - error is logged
		2 - application-context-name-not-supported	No association accomplished - error is logged
		3 - calling-AE-title-not-recognized	No association accomplished - error is logged
		7 - called-AE-title-not-recognized	No association accomplished - error is logged
	2 - DICOM UL service-provider (ACSE related function)	1 - no-reason-given	No association accomplished - error is logged
		2 - protocol-version-not-supported	No association accomplished - error is logged
	3 - DICOM UL service-provider (Presentation related function)	1 - temporary congestion	No association accomplished - error is logged
		2 - local-limit-exceeded	No association accomplished - error is logged

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

Table 11: Association Abort Handling

Source	Reason/Diagnosis	Behavior
0 - DICOM UL service-user (initiated abort)	0 - reason-not-specified	Association is closed and error message is displayed
2 - DICOM UL service-provide (initiated abort)	0 - reason-not-specified	Association is closed and error message is displayed
	1 - unrecognized-PDU	Association is closed and error message is displayed
	2 - unexpected-PDU	Association is closed and error message is displayed
	4 - unrecognized-PDU parameter	Association is closed and error message is displayed
	5 - unexpected-PDU parameter	Association is closed and error message is displayed
	6 - invalid-PDU-parameter value	Association is closed and error message is displayed

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

4.2.1.3.1.1. Description and Sequencing of Activities

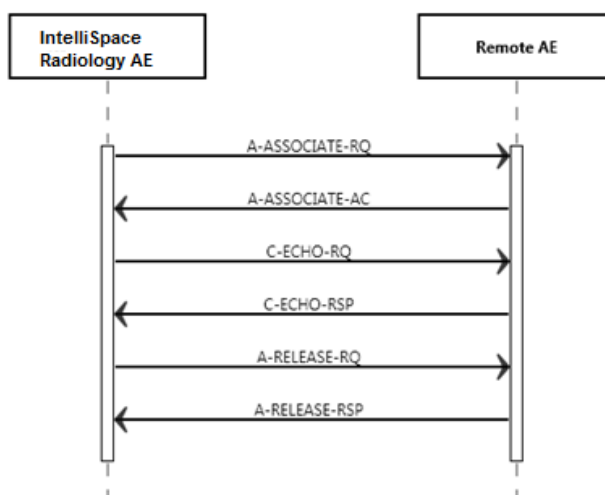


Figure 2: Sequence of C-ECHO as SCU

4.2.1.3.1.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 12: Proposed Presentation Contexts for (Real-World) Activity – Verification as SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.1.3.1.3. SOP Specific Conformance for Verification SOP Class

4.2.1.3.1.3.1. Dataset Specific Conformance for Verification C-ECHO SCU

The details regarding the response behavior to status codes are provided in next table.

Table 13: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Confirmation	The SCP has successfully responded to the verification request

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

4.2.1.3.2.1. Description and Sequencing of Activities

The IntelliSpace Radiology application entity will establish and manage associations with remote DICOM entities to service user requests for DICOM Image Printing. User requests for DICOM Image Printing are initiated by user interaction with the application interface.

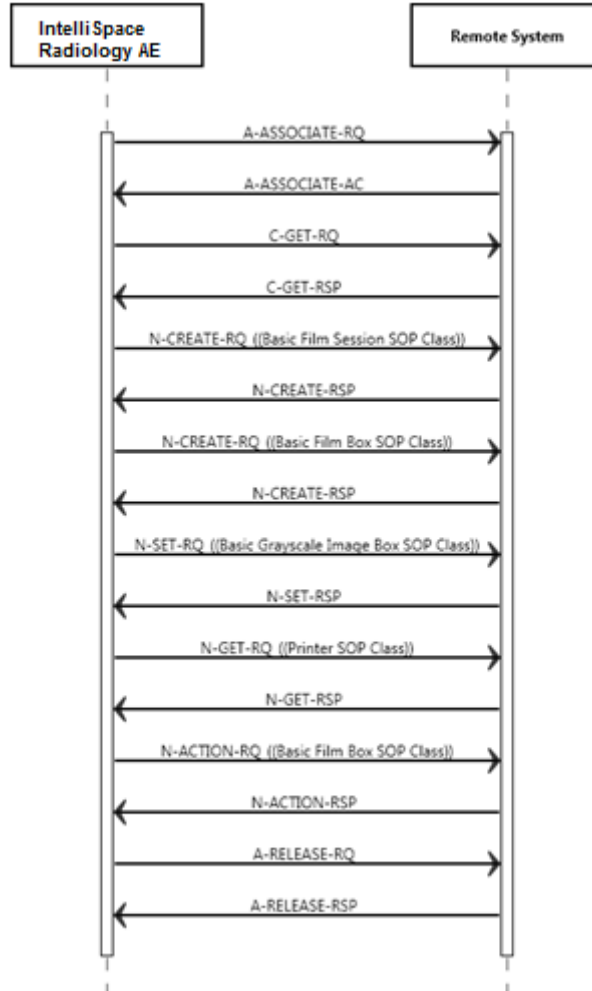


Figure 3: Sequence of Print Management as SCU

Note: The Printer Status N-GET and the N-EVENT-REPORT are Asynchronous messages that may occur at any time it is needed during the Print association open.

4.2.1.3.2.2. Proposed Presentation Contexts

The presentation contexts are defined in next table.

Table 14: Proposed Presentation Contexts for (Real-World) Activity – Print Management As SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	N/A	N/A	SCU	None
>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
>Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
>Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
>Printer SOP Class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

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

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

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

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The Action Reply argument in an N-ACTION response is not evaluated. The behavior of Hardcopy AE when encountering status codes in an N-ACTION response is summarized in the Table below:

Table 15: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	The SCP has completed the operation successfully.	The film has been accepted for printing
Failed	C602	Unable to create Print Job SOP Instance; print queue is full.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is displayed.
	C603	Film Box is empty, does not contain any image instance OR Image size is larger than Image Box size.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is displayed.
	C613	Combined Print Image Size is larger than Image Box size.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is displayed.
Warning	B604	Image size is larger than Image Box size. The image has been unmagnified.	The N-ACTION operation is considered successful but the status meaning is displayed.
	B609	Image size is larger than Image Box size. The image has been cropped to fit.	The N-ACTION operation is considered successful but the status meaning is displayed.
	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 N-ACTION operation is considered successful but the status meaning is displayed.
Other	xxxx	For any other Failed	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is displayed.

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

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

Table 16: Basic Film Box Presentation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Film Orientation	2010,0040	CS	LANDSCAPE, PORTRAIT	VNAP	USER	
Film Size ID	2010,0050	CS	8INX10IN, 8_5INX11IN, 10INX12IN, 10INX14IN, 11INX14IN, 11INX17IN, 14INX14IN, 14INX17IN, 24CMX24CM, 24CMX30CM, A4, A3	VNAP	USER	
Min Density	2010,0120	US		VNAP	USER	User input
Max Density	2010,0130	US		VNAP	USER	User input
Trim	2010,0140	CS	NO, YES	VNAP	USER	
Configuration Information	2010,0150	ST	Short Text	VNAP	CONFIG	

The following are the status response values for the Basic Film Box N-CREATE:

Table 17: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	Film Box successfully created	Send an N-Action for the created Film box to be printed
Warning	B605	Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead.	Display the warning on the IntelliSpace Radiology Radiology User Interface
Failure	C616	There is an existing Film Box that has not been printed and N-ACTION 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.	Display the error on the IntelliSpace Radiology Radiology User Interface, Printer need to clear the Error before it can get new film box/sessions to print
	0112	Invalid SOP Instance UID	Display the error on the IntelliSpace Radiology Radiology User Interface, Film Box can't be printed
	0110	Processing Failure	Display error on the IntelliSpace Radiology Radiology User Interface, Film Box can't be printed

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

The Basic Film Session IOD describes the presentation parameters which are common for all the films of a film session (e.g. number of films, film destination). The Basic Film Session SOP Instance refers to one or more Basic Film Box SOP Instances.

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

The IntelliSpace Radiology Film Session N-CREATE is used to create an instance of the Basic Film Session SOP Class. The following table describes the attributes being set by the N-CREATE:

Table 18: Basic Film Session SOP Class N-CREATE SCU Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Number of Copies	2000,0010	IS	Integer String	VNAP	USER	Maximum value is 10 copies
Print Priority	2000,0020	CS	LOW	VNAP	FIXED	
Medium Type	2000,0030	CS	BLUE FILM, CLEAR FILM, PAPER	ALWAYS	USER	

The behavior of IntelliSpace Radiology AE when encountering status codes in an N-CREATE response is summarized in the Table below:

Table 19: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	The SCP has completed the operation successfully.	The film has been accepted for printing.
Warning	0116	Attribute Value Out of Range	The N-CREATE operation is considered successful but the status meaning is logged. Additional information in the Response identifying the attributes out of range will be logged (i.e. Elements in the Modification List/Attribute List)
	0107	Attribute List Error	The N-CREATE operation is considered successful but the status meaning is logged. Additional information in the Response identifying the attributes will be logged (i.e. Elements in the Attribute Identifier List)
Failed	0106	No Memory Allocation Available	The SCP has no more memory allocation available for the new Film session.
	0213	Temporary No Memory Allocation Available	Temporarily, the Printer has no memory allocation available. Memory will free up as printer completes printing the current print jobs. The SCU will retry creating the Film session
	0112	Invalid SOP Instance UID	Display the error on the IntelliSpace Radiology User Interface, Film Box can't be printed
	0110	Processing Failure	Display the error on the IntelliSpace Radiology User Interface, Film Box can't be printed
Other	xxxx	For any other Failed	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

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

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

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

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

Table 20: Basic Grayscale Image Box SOP Class N-SET Response Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Position	2020,0010	US	Unsigned Short	ALWAYS	USER	
Basic Grayscale Image Sequence	2020,0110	SQ	N/A	N/A	N/A	
>Samples Per Pixel	0028,0002	US	1	ALWAYS	FIXED	
>Photometric Interpretation	0028,0004	CS	MONOCHROME2	ALWAYS	FIXED	
>Rows	0028,0010	US	Unsigned Short	ALWAYS	COPY	
>Columns	0028,0011	US	Unsigned Short	ALWAYS	COPY	
>Pixel Aspect Ratio	0028,0034	IS	Integer String	ALWAYS	COPY	
>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	0000H	ALWAYS	FIXED	
>Pixel Data	7FE0,0010	OS	Pixel Data	ALWAYS	COPY	

The behavior of the IntelliSpace Radiology AE when encountering status codes in an Image Box, N-SET response is summarized in the table below:

Table 21: Status Response

Service Status	Error Code	Further Meaning	Behavior
Success	0000	The SCP has completed the operation successfully.	The film has been accepted for printing.
Failed	C603	Image size is larger than Image Box size.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.
	C605	Insufficient memory in printer to store the image.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.
	C613	Combined Print Image Size is larger than Image Box size.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.
Warning	B605	Requested Min Density or Max Density outside of printer's operating range.	The N-SET operation is considered successful but the status meaning is logged.
	B609	Image size is larger than Image Box size. The image has been cropped to fit.	The N-SET operation is considered successful but the status meaning is 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 N-SET operation is considered successful but the status meaning is logged.
Other	xxxx	For any other Failed	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is displayed.

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

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

4.2.1.3.2.6.1. Dataset Specific Conformance for Printer N-GET SCU

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

Table 22: Printer SOP Class N-GET Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Printer Status	2110,0010	CS	String	VNAPCV	Printer	See below the Notes for Printer Status
Printer Status Info	2110,0020	CS	String	VNAPCV	Printer	See below the Note for Printer Status Info

The Printer Status information is evaluated as follows:

1. If Printer status (2110, 0010) is NORMAL, the print-job continues to be printed.
2. If Printer status (2110, 0010) is WARNING, the print-job continues to be printed. The contents of Printer Status Info (2110, 0020) is logged and reported to the IntelliSpace Radiology Display.
3. If Printer status (2110, 0010) is FAILURE, the print-job is marked as failed. The contents of Printer Status Info (2110, 0020) is logged and reported to the user on the IntelliSpace Radiology Display.

The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in the Table below:

Table 23: Status Response

Service Status	Error Code	Further Meaning	Explanation
Success	0000	The request to get printer status information was successful.	Printer accept the request to send Printer Status
Warning	0101	Received Optional Unsupported Attributes.	The contents of attribute Printer Status Info (2110, 0020) is logged and reported to the IntelliSpace Radiology Display.
	0107	Attribute List Error.	The contents of attribute Printer Status Info (2110, 0020) is logged and reported to the IntelliSpace Radiology Display.
Failure	0110	Print job failed.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported on the IntelliSpace Radiology Display.
	0112		
	0118		
	0119		
	0210		
	0211		
	0212		
	0213		

4.2.1.3.2.6.2. Dataset Specific Conformance for Printer N-EVENT-REPORT SCP

The IntelliSpace Radiology is capable of receiving an N-EVENT-REPORT request at any time during the Print Management association.

The following table describes the IntelliSpace Radiology behavior when receiving an N-EVENT-REPORT-RQ:

Table 24: N-EVENT Report Behavior

Event Type Name	Event Type ID	Behavior
Normal	1	The print-job continues to be printed.
Warning	2	The print-job continues to be printed. The contents of Printer Name (2110,0030) and Printer Status Info (2110,0020) is logged and reported on the IntelliSpace Radiology Display Screen
Failure	3	The print-job is marked as failed. The contents of Printer Name (2110,0030) and Printer Status Info (2110,0020) is logged and reported on the IntelliSpace Radiology Display Screen

The reasons for returning specific status codes in an N-EVENT-REPORT response are summarized in the Table below:

Table 25: Status Response

Service Status	Error Code	Further Meaning	Explanation
Success	0000	The request to get printer status information was successful.	Printer accepts the request to send Printer Status.
Failure	0110	No Such Event Type	An invalid Event Type ID was supplied in the N-EVENT-REPORT request.
	0113	Processing Failure	An internal error occurred during processing of the N-EVENT-REPORT.

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	IntelliSpace Radiology displays the error message
		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	IntelliSpace Radiology displays the error message
		2 - protocol-version-not-supported	
3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	IntelliSpace Radiology displays the error message	
	2 - local-limit-exceeded		
2 - Rejected-transient	1 - DICOM UL service-user	1 - no-Reason-given	IntelliSpace Radiology displays the error message
		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	IntelliSpace Radiology displays the error message
		2 - protocol-version-not-supported	
	3 - DICOM UL service provider (Presentation related function)	1 - temporary-congestion	IntelliSpace Radiology displays the error message
		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	Association is closed and error message is logged
2 - DICOM UL service-provider (initiated abort)	0 - reason-not-specified	
	1 - unrecognized-PDU	
	2 - unexpected-PDU	
	4 - unrecognized-PDU parameter	
	5 - unexpected-PDU parameter	
	6 - invalid-PDU-parameter value	

4.3. Network Interfaces

4.3.1. Physical Network Interfaces

The System provides only DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.

TCP/IP is the only protocol stack supported.

Supported physical medium include:

- IEEE 802.3-1995 10BASE-T
- IEEE 802.3-1995 100BASE-TX (Fast Ethernet)
- IEEE 802.3 1000BASE-X (Fiber Optic Gigabit Ethernet).

The TCP/IP Stack as supported by the underlying Operating System.

The API is the WinSock 2 interface as supported by the underlying Operating System.

4.3.2. Additional Protocols

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

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

4.4.1.1. Local AE Titles

The table shows the pre-configured AE Titles. All AE Titles can be changed via the IntelliSpace Radiology configuration.

Table 28: AE Title configuration table

Application Entity	Role	Default AE Title	Default TCP/IP Port
IntelliSpace Radiology AE	Print SCU	STENTOR_SCU	N/A

4.4.1.2. Remote AE Title/Presentation Address Mapping

Not Applicable.

4.4.2. Parameters

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

Table 29: Configuration Parameters Table

Parameter	Configurable	Default Value
General Parameter		
Time-out waiting for acceptance or rejection Response to an Association Open Request (Application Level timeout)	No	30 seconds
General DIMSE level time-out values (Verification, Storage, Storage Commitment)	No	30 seconds
Time-out for response to TCP/IP connect request. (Low-level timeout)	No	30 seconds
Time-out waiting for acceptance of a TCP/IP message over the network (Low-level timeout)	No	30 seconds
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	30 seconds
AE Specific Parameters		
Maximum PDU size the AE can receive	No	64234 bytes
Maximum PDU size the AE can send	No	64234 bytes
Print Management Specific Parameters		
Delay between retries	No	60 seconds

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

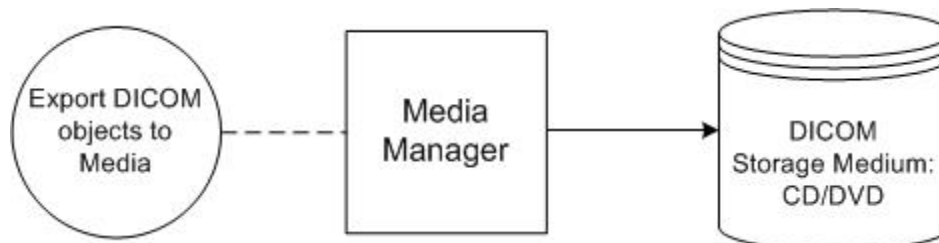


Figure 4: Media Application Data Flow Diagram

The Media Manager Application Entity exports images and Presentation States to a removable media (CD/DVD) Storage. It is associated with the local real-world activity “Export DICOM objects to media.” “Export DICOM objects to Media” is performed upon user request for selected patients, studies, series or instances (images or presentation states).

5.1.2. Functional Definitions of AE's

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

5.1.2.1. Functional Definition of Media-Manager Application Entity

The IntelliSpace Radiology Media Manager Application is part of the Media Manager tool from the IntelliSpace Radiology AE. It is capable of exporting local exams in DICOM Media format, including the DICOMDIR for the File set. Only one File set and DICOMDIR is allowed on the Media. Spanning File sets across multiple CD's or DVD's is not supported. Transfer syntax for the media will be the same as the Received or Created SOP Classes, transfer syntax.

5.1.3. Sequencing of Real World Activities

At least one image/presentation state/structured report/etc. must exist and be selected before the Media Manager Application Entity can be invoked. The operator can insert a new CD/DVD media at any time before or after invocation of the Media Application Entity. The Media Application Entity will wait indefinitely for a media to be inserted before starting to write to the media device.

5.1.4. File Meta Information Options

The implementation information written to the File Meta Header in each file is:

Table 30: DICOM Implementation Class and Version for Media Storage

Implementation Class UID	1.3.46.670589.42.1.4.4.5
Implementation Version Name	PHISUDM3100

5.2. AE Specifications

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

5.2.1. Functional Definition of Media-Manager Application Entity

The IntelliSpace Radiology Media Manager Application is part of the Media Manager tool from the IntelliSpace Radiology AE. It is capable of exporting local exams in DICOM Media format, including the DICOMDIR for the File set. Only one File set and DICOMDIR is allowed on the Media. Spanning File sets across multiple CD's or DVD's is not supported. Transfer syntax for the media will be the same as the Received or Created SOP Classes, transfer syntax.

5.2.2. Sequencing of Real World Activities

At least one image/presentation state/structured report/etc. must exist and be selected before the Media Manager Application Entity can be invoked. The operator can insert a new CD/DVD media at any time before or after invocation of the Media Application Entity. The Media Application Entity will wait indefinitely for a media to be inserted before starting to write to the media device.

5.2.3. Media - Specification

Table 31: AE media 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

5.2.3.1. File Meta Information for the media

Table 32: DICOM Implementation Class and Version for Media Storage

Implementation Class UID	1.3.46.670589.42.1.4.4.5
Implementation Version Name	PHISUDM3100

5.3. Exporting DICOM SOP Classes on Media

IntelliSpace Radiology support the export of all the transferred SOP Classes received on the Network or Created by IntelliSpace Radiology.

The Encapsulated PDF Storage SOP Class is supported only for the purpose of translating the Radiology Reports that are received through the HL7 ORU message and are transcoded to DICOM Encapsulated PDF and can be exported only through the DICOM Media. Enclosed is the Presentation Context for the media exported of Encapsulated PDF Storage SOP Class:

Table 33: Presentation Contexts for (Real-World) Activity – Exporting DICOM SOP Classes on Media

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1	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		

5.3.1. BSN Patient Identifier Support on Media

The BSN Patient Identifier can be stored on DICOM Media when selected by the user

The BSN Patient Identifier is stored in the Patient Id attribute (0010, 0020) in the DICOMDIR and is accompanied by the Issuer of Patient Id attribute (0010,0021). The Issuer of Patient Id has a fixed value of "2.16.840.1.113883.2.4.6.3".

The DICOM SOP instance Patient Identifier attributes is updated according to the following table

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Table 34 M-WRITE BSN mode additional attributes

Attribute Name	Tag	VR	Remark/ Comment
Patient Identification Module			
Patient's Name	0010,0010	PN	Returns only first, middle and last name
Patient ID	0010,0020	LO	Patient BSN Identifier
Issuer of Patient ID	0010,0021	LO	Always "2.16.840.1.113883.2.4.6.3"
Other Patient IDs Sequence	0010,1002	SQ	Existing Patient Identifiers received via DICOM in this sequence are preserved as is. The original Patient ID and BSN Identifier are added according following definition.
> Patient ID	0010,0020	LO	BSN or Patient ID
> Issuer of Patient ID	0010,0021	LO	In case of a BSN Patient ID it contains: "2.16.840.1.113883.2.4.6.3". For other Patient Identifiers the HL7 Namespace ID is filled in if defined.
> Type Of Patient ID	0010,0022	CS	"TEXT"
> Issuer of Patient ID Qualifiers Sequence	0010,0024	SQ	For non-BSN Patient ID entries this sequence is added in case an HL7 Universal Entity ID or HL7 Namespace exists
>> Universal Entity ID	0040,0032	UT	Value as configured for the HL7 assigning authority (the HL7 Universal Entity ID)
>> Universal Entity ID Type	0040,0033	CS	Type of configured HL7 Universal Entity ID if the HL7 Universal Entity ID exists

5.4. Augmented and Private Application Profiles

Not applicable

5.5. Media Configuration

Not applicable.

6. Support of Character Sets

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

Table 35: Supported DICOM Character Sets

Character Set Description	Defined Term	ESC Sequence	ISO Registration Number	Code Element	Character Set
Latin alphabet No. 1	ISO_IR 100	N/A	ISO-IR 6	G0	ISO 646
		N/A	ISO-IR 100	G1	Supplementary set of ISO 8859

7. Security

7.1. Security Profiles

The IntelliSpace Radiology allows the use of either a conventional (non-secure) DICOM communication or a secure DICOM communication based on the Transport Layer Security (TLS) protocol. If configured, the IntelliSpace Radiology supports security measures for:

- Secure authentication of a node
- Integrity and confidentiality of transmitted data
- Replay protection
- Access control and user authentication

7.1.1. Security use Profiles

Not applicable

7.1.2. Security Transport Connection Profiles

Secure communication is a "mode of operation" supported by the implementation of the DICOM Basic TLS Secure Transport Connection Profile [DICOM]. This functionality will be used by the nodes, which can authenticate each other before they exchange DICOM information. For secure communication the TLS protocol v1.2 is used which provides message authentication, integrity, confidentiality, and replay protection. Confidentiality is optional and can be controlled by the encryption settings. The IntelliSpace Radiology may communicate using the following Cipher Suites:

- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA (dh 256) – A
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA (dh 256) – A
- TLS_RSA_WITH_AES_256_CBC_SHA (rsa 1024) – A
- TLS_RSA_WITH_AES_128_CBC_SHA (rsa 1024) – A
- TLS_RSA_WITH_3DES_EDE_CBC_SHA (rsa 1024) – D
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA (dh 256) – A
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA (dh 256) – A
- TLS_RSA_WITH_AES_256_CBC_SHA (rsa 1024) – A
- TLS_RSA_WITH_AES_128_CBC_SHA (rsa 1024) - A
- TLS_RSA_WITH_3DES_EDE_CBC_SHA (rsa 1024) – D
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384 (dh 256) – A
- TLS_DHE_RSA_WITH_AES_256_GCM_SHA384 (dh 128) - B
- TLS_DHE_RSA_WITH_AES_128_GCM_SHA256 (dh 128) – C
- TLS_RSA_WITH_AES_256_GCM_SHA384 (rsa 1024) - A
- TLS_RSA_WITH_AES_128_GCM_SHA256 (rsa 1024) – A
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256 (dh 256) – A
- TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA (dh 256) - A
- TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA (dh 256) – A
- TLS_RSA_WITH_AES_256_CBC_SHA256 (rsa 1024) – A
- TLS_RSA_WITH_AES_128_CBC_SHA256 (rsa 1024) – A
- TLS_RSA_WITH_AES_256_CBC_SHA (rsa 1024) – A
- TLS_RSA_WITH_AES_128_CBC_SHA (rsa 1024) - A
- TLS_RSA_WITH_3DES_EDE_CBC_SHA (rsa 1024) - D

The IntelliSpace Radiology supports X.509 certificates. The following TLS Certification checks will be done (TLS Handshake).

- Choose the certificate according to Common Name (CN) value in the Subject-field.
- This name is case-sensitive. All present certificates should have unique CN names.

The server verifies:

- That the ISR certificate is a X.509 certificate which is not tampered with
- That the ISR certificate is in the list of trusted certificates
- That the ISR certificate is not expired (present time is between "Valid From" and "Valid To" fields of the X.509 certificate)
- That the ISR certificate has the correct purpose (at least the Client Authentication purpose)

The ISR verifies:

- That the server certificate is a X.509 certificate which is not tampered with
- That the server certificate is in the list of trusted certificates
- That the server certificate is not expired (present time is between "Valid From" and "Valid To" fields of the X.509 certificate)
- That the server certificate has the correct purpose (at least Server Authentication purpose)

The IntelliSpace Radiology can only read certificates from the certificate stores of the HKEY_LOCAL_MACHINE registry key. It is the responsibility of the Hospital to setup and maintain the certificate stores. This includes the removal of revoked certificates and certificate updates prior to their expiration. Since neither X.500 directories, neither Lightweight Directory Access Protocol (LDAP) nor Certificate Revocation Lists (CRLs) are supported, the whole certificate chain needs to be replaced after a security breach.

7.1.3. Digital Signature Profiles

Not supported

7.1.4. Media Storage Security Profiles

Not supported

7.1.5. Attribute Confidentiality Profiles

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

The IntelliSpace Radiology allows configuring replacement values from the administration application and these values are used while exporting. These attributes are applicable for DICOM media (Local Export)

The table below lists the protected attributes. The terms used to describe the replacement value (default) can be read as below:

Table 36: Basic Application Level Confidentiality Profile Attributes supported by IntelliSpace Radiology

Name	Tag	VR	Replacement Value
Instance Creation Date	0008,0012	DA	Empty
Instance Creation Time	0008,0013	TM	Empty
Study Date	0008,0020	DA	Anonymized Study Date
Series Date	0008,0021	DA	Anonymized Study Date
Acquisition Date	0008,0022	DA	Empty
Content Date	0008,0023	DA	Anonymized Study Date
Acquisition Date/Time	0008,002A	DT	Anonymized Study Date Time
Study Time	0008,0030	TM	Anonymized Study Time
Series Time	0008,0031	TM	Anonymized Study Time
Acquisition Time	0008,0032	TM	Empty
Content Time	0008,0033	TM	Anonymized Study Time

Name	Tag	VR	Replacement Value
Accession Number	0008,0050	SH	Anonymized Accession number
Institution Name	0008,0080	LO	Empty
Institution Address	0008,0081	ST	Empty
Referring Physician's Name	0008,0090	PN	Empty
Referring Physician's Address	0008,0092	ST	Empty
Referring Physician's Telephone No	0008,0094	SH	Empty
Code meaning	0008,0104	LO	Empty
Station Name	0008,1010	SH	Empty
Study Description	0008,1030	LO	Empty
Series Description	0008,103E	LO	Empty
Institutional Department Name	0008,1040	LO	Empty
Physician of Record	0008,1048	PN	Empty
Attribute Modification DateTime	0400,0562	DT	Empty
Performing Physician Name	0008,1050	PN	Empty
Performing Physician Identification Sequence	0008,1052	SQ	Attribute is removed
Name of Physician Reading Study	0008,1060	PN	Empty
Physician(s) Reading Study Identification Sequence	0008,1062	SQ	Attribute is removed
Operator Name	0008,1070	PN	Empty
Operator Identification Sequence	0008,1072	SQ	Attribute is removed
Admitting Diagnosis Description	0008,1080	LO	Empty
Derivation Description	0008,2111	ST	Empty
Identifying Comments	0008,4000	LT	Empty
Patient Name	0010,0010	PN	Anonymized Patient Name
Patient ID	0010,0020	LO	Anonymized MRN
Issuer of Patient ID	0010,0021	LO	Empty
Patient Birth Date	0010,0030	DA	Anonymized DOB
Patient's Birth Time	0010,0032	TM	Empty
Patient's Sex	0010,0040	CS	Anonymized Sex
Patient Insurance Plan Code Sequence	0010,0050	SQ	Attribute is removed
Other Patient IDs	0010,1000	LO	Empty
Other Patient Names	0010,1001	PN	Empty
Other Patient IDs Sequence	0010,1002	SQ	Attribute is removed
Patient Birth Name	0010,1005	PN	Empty
Patient Age	0010,1010	AS	Empty
Patient Size	0010,1020	DS	Empty
Patient Weight	0010,1030	DS	Empty
Patient Address	0010,1040	LO	Empty
Patient Insurance Plan ID	0010,1050	LO	Empty
Patient's Mother's Birth Name	0010,1060	PN	Empty
Military Rank	0010,1080	LO	Empty
Branch of (military) Service	0010,1081	LO	Empty
Medical Record Locator	0010,1090	LO	Empty
Medical Alerts	0010,2000	LO	Empty
Contrast Allergies	0010,2110	LO	Empty
Country of Residence	0010,2150	LO	Empty
Region of Residence	0010,2152	LO	Empty
Patient Telephone Number	0010,2154	SH	Empty
Ethnic Group	0010,2160	SH	Empty

Name	Tag	VR	Replacement Value
Occupation	0010,2180	SH	Empty
Smoking Status	0010,21A0	CS	Empty
Additional Patient History	0010,21B0	LT	Empty
Pregnancy Status	0010,21C0	US	Empty
Last Menstrual Date	0010,21D0	DA	Empty
Patient Religious Preference	0010,21F0	LO	Empty
Responsible Person	0010,2297	PN	Empty
Responsible Organization	0010,2299	LO	Empty
Patient Comments	0010,4000	LT	Empty
Clinical Trial Sponsor Name	0012,0010	LO	Empty
Clinical Trial Protocol ID	0012,0020	LO	Empty
Clinical Trial Protocol Name	0012,0021	LO	Empty
Clinical Trial Site ID	0012,0030	LO	Empty
Clinical Trial Site Name	0012,0031	LO	Empty
Clinical Trial Subject ID	0012,0040	LO	Empty
Clinical Trial Subject Reading ID	0012,0042	LO	Empty
Clinical Trial Time Point ID	0012,0050	LO	Empty
Clinical Trial Time Point Description	0012,0051	ST	Empty
Clinical Trial Coordinating Center Name	0012,0060	LO	Empty
Clinical Trial Series ID	0012,0071	LO	Empty
Clinical Trial Series Description	0012,0072	LO	Empty
Device Serial Number	0018,1000	LO	Empty
Date of Secondary Capture	0018,1012	DA	Empty
Protocol Name	0018,1030	LO	Empty
Radiopharmaceutical Start DateTime	0018,1078	DT	Empty
Radiopharmaceutical Stop DateTime	0018,1079	DT	Empty
Date of Last Calibration	0018,1200	DA	Empty
Acquisition Comments	0018,4000	LT	Empty
Date of Last Detector Calibration	0018,700C	DA	Empty
Frame Acquisition DateTime	0018,9074	DT	Empty
Frame Reference DateTime	0018,9151	DT	Empty
Start Acquisition DateTime	0018,9516	DT	Empty
End Acquisition DateTime	0018,9517	DT	Empty
Contribution DateTime	0018,A002	DT	Empty
Study ID	0020,0010	SH	Empty
Modified Image Date	0020,3403	DA	Empty
Image Comments	0020,4000	LT	Empty
Frame Comments	0020,9158	LT	Empty
Image Presentation Comments	0028,4000	LT	Empty
Study Verified Date	0032,0032	DA	Empty
Study Read Date	0032,0034	DA	Empty
Scheduled Study Start Date	0032,1000	DA	Empty
Scheduled Study Stop Date	0032,1010	DA	Empty
Requesting Physician	0032,1032	PN	Empty
Requesting Service	0032,1033	LO	Empty
Study Arrival Date	0032,1040	DA	Empty
Study Completion Date	0032,1050	DA	Empty
Study Comments	0032,4000	LT	Empty

Name	Tag	VR	Replacement Value
Referenced Patient Alias Sequence	0038,0004	SQ	Attribute is removed
Visit Status ID	0038,0008	CS	Empty
Admission ID	0038,0010	LO	Empty
Issuer of Admission ID	0038,0011	LO	Empty
Route of Admissions	0038,0016	LO	Empty
Scheduled Admission Date	0038,001A	DA	Empty
Scheduled Admission Time	0038,001B	TM	Empty
Scheduled Discharge Date	0038,001C	DA	Empty
Scheduled Discharge Time	0038,001D	TM	Empty
Scheduled Patient Institution Residence	0038,001E	LO	Empty
Admitting Date	0038,0020	DA	Empty
Admitting Time	0038,0021	TM	Empty
Discharge Date	0038,0030	DA	Empty
Discharge Time	0038,0032	TM	Empty
Discharge Diagnosis Description	0038,0040	LO	Empty
Discharge Diagnosis Code Sequence	0038,0044	SQ	Attribute is removed
Special Needs	0038,0050	LO	Empty
Service Episode ID	0038,0060	LO	Empty
Service Episode Description	0038,0062	LO	Empty
Current Patient Location	0038,0300	LO	Empty
Patient's Institution Residence	0038,0400	LO	Empty
Patient State	0038,0500	LO	Empty
Patient Clinical Trial Participation Sequence	0038,0502	SQ	Attribute is removed
Visit Comments	0038,4000	LT	Empty
Scheduled Procedure Step Start Date	0040,0002	DA	Anonymized Study Date
Scheduled Procedure Step End Date	0040,0004	DA	Empty
Scheduled Performing Physician's Name	0040,0006	PN	Empty
Scheduled Procedure Step Description	0040,0007	LO	Empty
Performed Procedure Step Start Date	0040,0244	DA	Empty
Performed Procedure Step Start Time	0040,0245	TM	Empty
Performed Procedure Step End Date	0040,0250	DA	Empty
Performed Procedure Step Stop Time	0040,0251	TM	Empty
Performed Procedure Step ID	0040,0253	SH	Empty
Performed Procedure Step Description	0040,0254	LO	Empty
Request Attributes Sequence	0040,0275	SQ	Attribute is removed
Comments on the Performed Procedure Step	0040,0280	ST	Empty
Comments on Radiation Dose	0040,0310	ST	Empty
Comments on the Scheduled Procedure Step	0040,0400	LT	Empty
Names of Intended Recipients of Results	0040,1010	PN	Empty
Requested Procedure Comments	0040,1400	LT	Empty
Issue Date of Imaging Service Request	0040,2004	DA	Empty
Order Entered By	0040,2008	PN	Empty
Imaging Service Request Comments	0040,2400	LT	Empty
Scheduled Procedure Step Start Date and Time	0040,4005	DT	Anonymized Study Date Time
Scheduled Procedure Step Modification Date and Time	0040,4010	DT	Empty
Expected Completion Date and Time	0040,4011	DT	Empty
Human Performer's Name	0040,4037	PN	Empty
Verification Date Time	0040,A030	DT	Anonymized Study Date Time

Name	Tag	VR	Replacement Value
Observation Date Time	0040,A032	DT	Empty
Verifying Observer Name	0040,A075	PN	Empty
Participation DateTime	0040,A082	DT	Empty
DateTime	0040,A120	DT	Empty
Date	0040,A121	DA	Empty
Person Name	0040,A123	PN	Empty
Referenced DateTime	0040,A13A	DT	Empty
Content Sequence	0040,A730	SQ	Attribute is removed
Template Version	0040,DB06	DT	Empty
Template Local Version	0040,DB07	DT	Empty
HL7 Document Effective Time	0040,E004	DT	Anonymized Study Date Time
Approval Status DateTime	0044,0004	DT	Anonymized Study Date Time
Product Expiration DateTime	0044,000B	DT	Empty
Substance Administration DateTime	0044,0010	DT	Empty
Presentation Creation Date	0070,0082	DA	Anonymized Study Date
Content Creator's Name	0070,0084	PN	Empty
Hanging Protocol Creation DateTime	0072,000A	DT	Anonymized Study Date Time
Selector PN Value	0072,006A	PN	Empty
SOP Authorization Date and Time	0100,0420	DT	Empty
Digital Signature DateTime	0400,0105	DT	Anonymized Study Date Time
Attribute Modification DateTime	0400,0562	DT	Anonymized Study Date Time
Creation Date	2100,0040	DA	Empty
Structure Set Date	3006,0008	DA	Empty
ROI Interpreter	3006,00A6	PN	Empty
Treatment Control Point Date	3008,0024	DA	Anonymized Study Date
First Treatment Date	3008,0054	DA	Empty
Most Recent Treatment Date	3008,0056	DA	Empty
Safe Position Exit Date	3008,0162	DA	Empty
Safe Position Return Date	3008,0166	DA	Empty
Treatment Status Comment	3008,0202	ST	Empty
Treatment Date	3008,0250	DA	Empty
RT Plan Date	300A,0006	DA	Empty
Source Strength Reference Date	300A,022C	DA	Anonymized Study Date
Setup Image Comment	300A,0402	ST	Empty
Review Date	300E,0004	DA	Empty
Reviewer Name	300E,0008	PN	Empty
Text Comments	4000,4000	LT	Empty
Interpretation Recorded Date	4008,0100	DA	Empty
Interpretation Recorder	4008,0102	PN	Empty
Interpretation Transcription Date	4008,0108	DA	Empty
Interpretation Transcriber	4008,010A	PN	Empty
Interpretation Author	4008,010C	PN	Empty
Interpretation Approval Date	4008,0112	DA	Empty
Physician Approving Interpretation	4008,0114	PN	Empty
Distribution Name	4008,0119	PN	Empty
Results Comments	4008,4000	ST	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty

Name	Tag	VR	Replacement Value
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty
Overlay Comments	60xx,4000	LT	Empty

7.1.6. Network Address Management Profiles

IntelliSpace Radiology incorporates Microsoft active directory integrated DNS. The IP addresses are assigned manually to each of the IntelliSpace Radiology node. The name resolution of IntelliSpace Radiology node is carried out on the DNS active directory integrated DNS. The DNS client can obtain the IP number for any of the node by giving the DNS hostname to a DNS server and receive IP number in response.

7.1.7. Time Synchronization Profiles

Time synchronization for each of the IntelliSpace Radiology node is done through active directory service. An extended NTP is configured on the IntelliSpace Radiology environment based on the time server availability at customer location.

7.1.8. Application Configuration Management Profiles

IntelliSpace Radiology uses active directory in place of LDAP. In IntelliSpace Radiology environment used to create domain for all the IntelliSpace Radiology nodes (member servers). Active directory is mainly used for name resolution between nodes & create application service accounts.

7.1.9. Audit Trail Profiles

Based on the events triggered from IntelliSpace Radiology, audit messages will be logged from Universal Data Manager.

7.2. Association Level Security

Enterprise Imaging provides association level security by accepting association requests from any DICOM AEs .if the AE is UNKNOWN by organization configuration then data will be listed in exception worklist.

7.3. Application Level Security

Enterprise Imaging application requires a valid user credentials to login.

8. Annexes of application "IntelliSpace Radiology AE"

8.1. IOD Contents

8.1.1. Created SOP Instance

This section specifies each IOD created 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

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 37: List of created SOP Classes

SOP Class Name	SOP Class UID
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
Encapsulated PDF Storage SOP Class	1.2.840.10008.5.1.4.1.1.104.1
*Breast Tomosynthesis Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.13.1.3
Key Object Selection Document Storage SOP Class	1.2.840.10008.5.1.4.1.1.88.59

The IntelliSpace Radiology Created SOP Classes instances will use the Philips PACS Instance UID identification:
 1.3.46.670589.42.3.x Where x will identify the specific instance.

The Encapsulated PDF Storage SOP Class, is being created only for Media Export, for more details see Sections 5.2 and 8.1.1.3

The Breast Tomosynthesis Image Storage SOP Class is described in the below section 8.1.1.4

*Breast Tomosynthesis SOP class (1.2.840.10008.5.1.4.1.1.13.1.3) - 2D Generated Slab can ONLY be created with Advanced Mammo option ENABLED.

The Raw data SOP Class is a Standard Extended SOP Class and it is described in the section 8.5.1.

8.1.1.2. Grayscale Softcopy Presentation State Storage SOP Class

Table 38: 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
	Patient Study Module	User defined
Series	General Series Module	ALWAYS
	Presentation Series Module	ALWAYS
Equipment	General Equipment Module	ALWAYS
Presentation State	Presentation State Identification Module	ALWAYS
	Presentation State Relationship Module	ALWAYS
	Overlay Plane Module	CONDITIONAL
	Overlay Activation Module	CONDITIONAL
	Displayed Area Module	ALWAYS for Creation. Not Supported for Loading
	Graphic Annotation Module	CONDITIONAL
	Spatial Transformation Module	CONDITIONAL
	Graphic Layer Module	CONDITIONAL
	Modality LUT Module	CONDITIONAL
	Softcopy VOI LUT Module	CONDITIONAL
	Softcopy Presentation LUT Module	ALWAYS
	SOP Common Module	ALWAYS

Note: The enclosed GSPS Modules supported are describing both the GSPS object Creation/Write and loading GSPS objects from importing Studies from modalities or other workstations.

Table 39: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN	Any	VNAP	COPY	Copied from primary image.
Patient ID	0010,0020	LO	Any	VNAP	COPY	Copied from primary image.
Patient's Birth Date	0010,0030	DA	Any	VNAP	COPY	Copied from primary image.
Patient's Sex	0010,0040	CS	Any	VNAP	COPY	Copied from primary image.
Patient Comments	0010,4000	LT		ANAP	COPY	

For Patient module, the optional type 3 tags are not being loaded and similarly for the created new GSPS these type 3 tags are not added.

Table 40: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA	Any	VNAP	COPY	Copied from primary image.
Study Time	0008,0030	TM	Any	VNAP	COPY	Copied from primary image.
Accession Number	0008,0050	SH	Any	VNAP	COPY	Copied from primary image.
Referring Physician's Name	0008,0090	PN	Any	VNAP	COPY	Copied from primary image.
Study Description	0008,1030	LO		ANAP	COPY	Copied from primary image
Study Instance UID	0020,000D	UI	Any	ALWAYS	AUTO	
Study ID	0020,0010	SH	Any	VNAP	COPY	Copied from primary image.

Table 41: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		ANAP	COPY	Copied from primary image

Table 42: General Series Module

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

For General Series module, the optional type 3 tags are not being loaded and similarly for the created new GSPS these type 3 tags are not added.

Table 43: Presentation Series Module

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

Table 44: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP	AUTO	
Manufacturer's Model Name	0008,1090	LO	IntelliSpace Radiology	ANAP	COPY	Copied from primary image
Software Versions	0018,1020	LO	Version 4.7.0.0 Build 4.7.1078.0	ANAP	COPY	Copied from primary image
Institution Name	0008,0080	LO		VNAP	AUTO	The institution name is not entered when created a GSPS

For General Equipment module, the optional type 3 tags are not being loaded and similarly for the created new GSPS these type 3 tags are not added.

Table 45: Presentation State Identification Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Content Label	0070,0080	CS		ALWAYS	AUTO	
Content Description	0070,0081	LO		VNAP	USER	
Presentation Creation Date	0070,0082	DA		ALWAYS	AUTO	
Presentation Creation Time	0070,0083	TM		ALWAYS	AUTO	
Content Creator's Name	0070,0084	PN		VNAP	AUTO	

For Presentation State Identification module, the optional type 3 tags are not being loaded and similarly for the created new GSPS these type 3 tags are not added.

Table 46: 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	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>>Referenced Frame Number	0008,1160	IS		ALWAYS	AUTO	
>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	

Table 47: Overlay Plane Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Rows	60xx,0010	US	Any	ALWAYS	COPY	Copied from primary image.
Overlay Columns	60xx,0011	US	Any	ALWAYS	COPY	Copied from primary image.
Overlay Type	60xx,0040	CS	G, R	ALWAYS	COPY	Copied from primary image.
Overlay Origin	60xx,0050	SS	Any	ALWAYS	COPY	Copied from primary image.
Overlay Bits Allocated	60xx,0100	US	1	ALWAYS	COPY	Copied from primary image.
Overlay Bit Position	60xx,0102	US	0	ALWAYS	COPY	Copied from primary image.
Overlay Data	60xx,3000	OW /OB	Any	ALWAYS	COPY	Copied from primary image.

For the Overlay Plane module, the optional type 3 tags are not being load and similarly for the created new GSPS these type 3 tags are not added.

Table 48: Overlay Activation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Overlay Activation Layer	60xx,1001	CS		VNAP	AUTO	

Table 49: Displayed Area Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Displayed Area Selection Sequence	0070,005A	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	
>Displayed Area Top Left Hand Corner	0070,0052	SL		ALWAYS	AUTO	
>Displayed Area Bottom Right Hand Corner	0070,0053	SL		ALWAYS	AUTO	
>Presentation Size Mode	0070,0100	CS	SCALE_TO_FIT, TRUE SIZE, MAGNIFY	ALWAYS	AUTO	Support only SCALE_TO_FIT
>Presentation Pixel Spacing	0070,0101	DS		ANAP	AUTO	
>Presentation Pixel Aspect Ratio	0070,0102	IS	"1/1"	ANAP	AUTO	
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	

The Display Area module is supported only for the GSPS Creation. The Loading from third party is NOT Supported.

Table 50: Graphic Annotation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Graphic Annotation Sequence	0070,0001	SQ		ALWAYS	AUTO	Implemented partial support for loading and writing.
>Referenced Image Sequence	0008,1140	SQ		ALWAYS	AUTO	implemented support for loading and writing
>>Referenced SOP Class UID	0008,1150	UI		ANAP	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
>Graphic Layer	0070,0002	CS		ALWAYS	AUTO	
>>Referenced Frame Number	0008,1160	IS		ANAP	AUTO	
>>Referenced Segment Number	0062,000B	US		ANAP	AUTO	Not Supported
>Text Object Sequence	0070,0008	SQ		ANAP	AUTO	
>>Bounding Box Annotation Units	0070,0003	CS	PIXEL	ANAP	AUTO	DISPLAY mode is Not Supported for Creation. The Creation of GSPS is always in Pixel mode. The Display mode is supported only for Loading a GSPS from an importation.
>>>Anchor Point Annotation Units	0070,0004	CS	PIXEL, DISPLAY	ALWAYS	AUTO	DISPLAY mode is Not Supported for Creation. The Creation of GSPS is always in Pixel mode. The Display mode is supported only for Loading a GSPS from an importation.
>>>Unformatted Text Value	0070,0006	ST		ALWAYS	AUTO	
>>>Bounding Box Top Left Hand Corner	0070,0010	FL		ANAP	AUTO	
>>>Bounding Box Bottom Right Hand Corner	0070,0011	FL		ANAP	AUTO	
>>>Bounding Box Text Horizontal Justification	0070,0012	CS	CENTER, LEFT, RIGHT	ANAP	AUTO	
>>>Anchor Point	0070,0014	FL	Any	ANAP	AUTO	
>>>Anchor Point Visibility	0070,0015	CS	N, Y	ANAP	AUTO	
>Graphic Object Sequence	0070,0009	SQ	Any	ANAP	AUTO	
>>Graphic Annotation Units	0070,0005	CS	PIXEL	ALWAYS	AUTO	DISPLAY mode is Not Supported for Creation. The Creation of GSPS is always in Pixel mode. The Display mode is supported only for Loading a GSPS from an importation.
>>>Graphic Dimensions	0070,0020	US	2	ALWAYS	AUTO	Supported and value "2" always for loading; Supported and value "2" always for writing.
>>>Number of Graphic Points	0070,0021	US	Any	ALWAYS	AUTO	
>>>Graphic Data	0070,0022	FL	Any	ALWAYS	AUTO	
>>>Graphic Type	0070,0023	CS	CIRCLE, ELLIPSE, POINT, POLYLINE, INTERPOLATED	ALWAYS	AUTO	INTERPOLATED mode is NOT Supported for the Creation of GSPS. For Loading imported GSPS We draw line between points. Note: Sub-pixel coordinates are truncated to integer

>>Graphic Filled	0070,0024	CS	N, Y	ANAP	AUTO	
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Table 51: Spatial Transformation Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Horizontal Flip	0070,0041	CS	N	ALWAYS	AUTO	Supported values: N, Y
Image Rotation	0070,0042	US	0	ALWAYS	AUTO	Supported values: 0, 90, 180, 270

Table 52: 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	Use case 1: User creates a GSPS on IntelliSpace Radiology after loading a GSPS. In this case, the layers specified in the original GSPS will be copied over to the new GSPS. So, the value can be anything. In addition to the layers present in source, IntelliSpace Radiology may add "INTELLISPACEL1" for additional Annotations and/or "INTELLISPACEOVERLAYS" layers for additional Overlays Use case 2: The user creates a new GSPS (without loading any GSPS) "INTELLISPACEL1" – ONLY for annotations that were created on IntelliSpace Radiology . "INTELLISPACEOVERLAYS" – for Overlays created ONLY when creating a new GSPS
>Graphic Layer Order	0070,0062	IS		ALWAYS	AUTO	
>Graphic Layer Recommended Display Grayscale Value	0070,0066	US		ANAP	AUTO	
>Graphic Layer Description	0070,0068	LO		ANAP	AUTO	

Table 53: Modality LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Rescale Intercept	0028,1052	DS		ANAP	COPY	Copied from primary image.
Rescale Slope	0028,1053	DS		ANAP	COPY	Copied from primary image.
Rescale Type	0028,1054	LO	HU, US	ANAP	COPY	"OD" type is Not been Supported
Modality LUT Sequence	0028,3000	SQ		ANAP	COPY	Copied from primary image.
>LUT Descriptor	0028,3002	US/SS		ALWAYS	COPY	Copied from primary image.
>LUT Explanation	0028,3003	LO		ANAP	COPY	Copied from primary image.
>Modality LUT Type	0028,3004	LO		ALWAYS	COPY	Copied from primary image.
>LUT Data	0028,3006	US/OW		ALWAYS	COPY	Copied from primary image.

Table 54: 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		ANAP	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ANAP	AUTO	
>> Referenced Frame Number	0008,1160	IS		ANAP	AUTO	
>Window Center	0028,1050	DS		ANAP	AUTO	
>Window Width	0028,1051	DS		ANAP	AUTO	
>VOI LUT Function	0028,1056	CS	LINEAR, SIGMOID	ANAP	AUTO	
>VOI LUT Sequence	0028,3010	SQ		ANAP	AUTO	
>>LUT Data	0028,3006	US/ OW		ANAP	AUTO	
>>LUT Descriptor	0028,3002	US/ SS		ANAP	AUTO	
>>LUT Explanation	0028,3003	LO		ANAP	AUTO	

Table 55: Softcopy Presentation LUT Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Presentation LUT Sequence	2050,0010	SQ		ANAP	AUTO	
>LUT Descriptor	0028,3002	US/ SS		ANAP	AUTO	
>LUT Explanation	0028,3003	LO		ANAP	AUTO	
>LUT Data	0028,3006	US/ OW		ANAP	AUTO	
Presentation LUT Shape	2050,0020	CS		ANAP	AUTO	

Table 56: 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		ANAP	AUTO	
SOP Instance UID	0008,0018	UI		ANAP	AUTO	
Instance Number	0020,0013	IS		ANAP	AUTO	

8.1.1.3. Encapsulated PDF Storage SOP Class

The Encapsulated PDF Storage SOP class shall be used to export the IntelliSpace Radiology Reports through the DICOM Media exchange. The supported Module and their tags are mentioned below.

Table 57: Encapsulated PDF Storage SOP Class - Supported Modules

Information Entity	Module	Presence Of Module
Patient	Patient	ALWAYS
Study	General Study	ALWAYS
Series	Encapsulated Document Series	ALWAYS
Equipment	General Equipment	ALWAYS

	SC Equipment	ALWAYS
Encapsulated Document	Encapsulated Document	ALWAYS
	SOP Common	ALWAYS

Note: IntelliSpace Radiology supports only the Mandatory module with the tags that are of type: 1, 1C, 2, 2C. The optional type 3 tags are not being created.

Table 58: Patient Module

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

Table 59: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	COPY	Copied from primary image.
Study Time	0008,0030	TM		VNAP	COPY	Copied from primary image.
Accession Number	0008,0050	SH		VNAP	COPY	Copied from primary image.
Referring Physician's Name	0008,0090	PN		VNAP	COPY	Copied from primary image.
Study Description	0008,1030	LO		VNAP	COPY	Copied from primary image.
Study Instance UID	0020,000D	UI		ALWAYS	COPY	Copied from primary image.
Study ID	0020,0010	SH		VNAP	COPY	Copied from primary image.

Table 60: Encapsulated 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		VNAP	COPY	Copied from primary image.
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		ALWAYS	AUTO	

Table 61: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP	AUTO	
Pixel Padding Value	0028,0120	US or SS		N/A	N/A	Padding is not required and not supported

Table 62: SC Equipment Module

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

Table 63: Encapsulated Document Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Acquisition DateTime	0008,002A	DT		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Burned In Annotation	0028,0301	CS		ALWAYS	AUTO	
Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	Codes for document title is not being used
HL7 Instance Identifier	0040,E001	ST		ALWAYS	AUTO	Not applicable for PDF documents
Document Title	0042,0010	ST		ALWAYS	AUTO	
Encapsulated Document	0042,0011	OB		ALWAYS	AUTO	
MIME Type of Encapsulated Document	0042,0012	LO		ALWAYS	AUTO	

Table 64: 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	1.2.840.10008.5.1.4.1.1.104.1	ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Instance Number	0020,0013	IS		VNAP	AUTO	

Table 65: Private/ Additional 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	

8.1.1.4. Breast Tomosynthesis Image Storage SOP Class

The supported Module and their tags are mentioned below.

Table 66: Breast Tomosynthesis Image Storage SOP Class - Supported Modules

Information Entity	Module	Presence Of Module
Patient	Patient	ALWAYS
Study	General Study	ALWAYS
	Patient Study	User Defined
Series	General Series	ALWAYS
	Enhanced Mammography Series	ALWAYS
Frame of Reference	Frame of Reference	ALWAYS
Equipment	General Equipment	ALWAYS
	Enhanced General Equipment	ALWAYS
Image	Image Pixel	ALWAYS

Acquisition Context	ALWAYS
Multi-frame Functional Groups	ALWAYS
X-Ray 3D Image	ALWAYS
X-Ray 3D Reconstruction	User Defined
Breast View	ALWAYS
SOP Common	ALWAYS

Table 67: Patient Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Name	0010,0010	PN		VNAP	COPY	Copied from primary image.
Patient ID	0010,0020	LO		VNAP	COPY	Copied from primary image.
Issuer of Patient ID	0010,0021	LO		ANAP	COPY	Copied from primary image.
Patient's Birth Date	0010,0030	DA		VNAP	COPY	Copied from primary image.
Patient's Sex	0010,0040	CS		VNAP	COPY	Copied from primary image.

Table 68: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0008,0020	DA		VNAP	COPY	Copied from primary image.
Study Time	0008,0030	TM		VNAP	COPY	Copied from primary image.
Accession Number	0008,0050	SH		VNAP	COPY	Copied from primary image.
Referring Physician's Name	0008,0090	PN		VNAP	COPY	Copied from primary image.
Study Instance UID	0020,000D	UI		ALWAYS	AUTO	
Study Description	0008,1030	LO		VNAP	COPY	Copied from primary image.
Study ID	0020,0010	SH		VNAP	AUTO	

Table 69: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Age	0010,1010	AS		VNAP	COPY	Copied from primary image.

Table 70: General Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	COPY	Copied from primary image.
Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	
Series Date	0008,0021	DA		VNAP	COPY	Copied from primary image.
Series Time	0008,0031	TM		VNAP	COPY	Copied from primary image.
Series Description	0008,103E	LO		VNAP	AUTO	
Referenced Performed Procedure Step Sequence	0008,1111	SQ		VNAP	COPY	Copied from primary image
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	COPY	Copied from primary image
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	COPY	Copied from primary image
Performing Physician's Name	0008,1050	PN		VNAP	COPY	Copied from primary image.

Operator's Name	0008,1070	PN		VNAP	COPY	Copied from primary image.
Body Part Examined	0018,0015	CS		VNAP	COPY	Copied from primary image.
Protocol Name	0018,1030	LO		VNAP	COPY	Copied from primary image.
Performed Procedure Step Start Date	0040,0244	DA		ANAP	COPY	Copied from primary image
Performed Procedure Step Start Time	0040,0245	TM		ANAP	COPY	Copied from primary image
Performed Procedure Step ID	0040,0253	SH		ANAP	COPY	Copied from primary image
Performed Procedure Step Description	0040,0254	LO		ANAP	COPY	Copied from primary image
Performed Protocol Code Sequence	0040,0260	SQ		ANAP	COPY	Copied from primary image
>Code Value	0008,0100	SH		ALWAYS	COPY	Copied from primary image
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	Copied from primary image
>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image

Table 71: Enhanced Mammography Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Modality	0008,0060	CS		ALWAYS	COPY	Copied from primary image.
Referenced Performed Procedure Step Sequence	0008,1111	SQ		ALWAYS	COPY	Copied from primary image
>Referenced SOP Class UID	0008,1150	UI		ALWAYS	COPY	Copied from primary image
>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	COPY	Copied from primary image

Table 72: Frame of Reference Module

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

Table 73: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP	COPY	Copied from primary image.
Manufacturer's Model Name	0008,1090	LO	IntelliSpace Radiology	VNAP	COPY	Copied from primary image.
Institution Name	0008,0080	LO		VNAP	COPY	Copied from primary image.
Institution Address	0008,0081	ST		VNAP	COPY	Copied from primary image.
Station Name	0008,1010	SH		VNAP	COPY	Copied from primary image.
Institutional Department Name	0008,1040	LO		VNAP	COPY	Copied from primary image.
Device Serial Number	0018,1000	LO		VNAP	COPY	Copied from primary image.
Software Version(s)	0018,1020	LO		VNAP	COPY	Copied from primary image.
Pixel Padding Value	0028,0120	US		VNAP	COPY	Copied from primary image.

Table 74: Enhanced General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO	Philips	VNAP	COPY	Copied from primary image.
Manufacturer's Model Name	0008,1090	LO	IntelliSpace Radiology	VNAP	COPY	Copied from primary image.

Table 75: 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	IMPLICIT	
Columns	0028,0011	US		ALWAYS	IMPLICIT	
Bits Allocated	0028,0100	US	16	ALWAYS	FIXED	
Bits Stored	0028,0101	US	10	ALWAYS	IMPLICIT	
High Bit	0028,0102	US	9	ALWAYS	IMPLICIT	
Pixel Representation	0028,0103	US	0	ALWAYS	IMPLICIT	
Pixel Data	7FE0,0010	OB/OW		ALWAYS	COPY	Copied from primary image.
Pixel Padding Range Limit	0028,0121	US		ALWAYS	COPY	Copied from primary image.

Table 76: Acquisition Context Module

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

Table 77: Multi-frame Functional Groups Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Shared Functional Groups Sequence	5200,9229	SQ		ALWAYS	COPY	Copied from primary image.
>Derivation Image Sequence	0008,9124	SQ		ALWAYS	COPY	Copied from primary image.
>>Derivation Code Sequence	0008,9215	SQ		ALWAYS	COPY	Copied from primary image.
>>>Code Value	0008,0100	SH		ALWAYS	COPY	Copied from primary image.
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	Copied from primary image.
>>>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image.
>Frame Anatomy Sequence	0020,9071	SQ		ALWAYS	COPY	Copied from primary image.
>>Anatomic Region Sequence	0008,2218	SQ		ALWAYS	COPY	Copied from primary image.
>>>Code Value	0008,0100	SH		ALWAYS	COPY	Copied from primary image.
>>>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	Copied from primary image.
>>>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image.
>>Frame Laterality	0020,9072	CS		ALWAYS	COPY	Copied from primary image.
>Plane Orientation Sequence	0020,9116	SQ		ALWAYS	COPY	Copied from primary image.
>>Image Orientation (Patient)	0020,0037	DS		ALWAYS	COPY	Copied from primary image.
>Frame VOI LUT Sequence	0028,9132	SQ		ALWAYS	COPY	Copied from primary image.
>>Window Center	0028,1050	DS		ALWAYS	COPY	Copied from primary image.
>>Window Width	0028,1051	DS		ALWAYS	COPY	Copied from primary image.

>Pixel Value Transformation Sequence	0028,9145	SQ		ALWAYS	COPY	Copied from primary image.
>>Rescale Intercept	0028,1052	DS		ALWAYS	COPY	Copied from primary image.
>>Rescale Slope	0028,1053	DS		ALWAYS	COPY	Copied from primary image.
>>Rescale Type	0028,1054	LO		ALWAYS	COPY	Copied from primary image.
Pixel Measures Sequence	0028,9110	SQ		ALWAYS	COPY	Copied from primary image.
>Pixel Spacing	0028,0030	DS		ALWAYS	COPY	Copied from primary image.
>Slice Thickness	0018,0050	DS		ALWAYS	COPY	Copied from primary image.
Plane Position Sequence	0020,9113	SQ		ALWAYS	COPY	Copied from primary image.
>Image Position (Patient)	0020,0032	DS		ALWAYS	COPY	Copied from primary image.
Plane Orientation Sequence	0020,9116	SQ		ALWAYS	COPY	Copied from primary image.
>Image Orientation(Patient)	0020,0037	DS		ALWAYS	COPY	Copied from primary image.
Frame Anatomy Sequence	0020,9071	SQ		ALWAYS	COPY	Copied from primary image.
>Frame Laterality	0020,9072	CS		ALWAYS	COPY	Copied from primary image.
Per-frame Functional Groups Sequence	5200,9230	SQ		ALWAYS	COPY	Copied from primary image.
>X-Ray 3D Frame Type Sequence	0018,9504	SQ		ALWAYS	COPY	Copied from primary image.
>>Frame Type	0008,9007	CS		ALWAYS	COPY	Copied from primary image.
>>Pixel Presentation	0008,9205	CS		ALWAYS	COPY	Copied from primary image.
>>Volumetric Properties	0008,9206	CS		ALWAYS	COPY	Copied from primary image.
>>Volume Based Calculation Technique	0008,9207	CS		ALWAYS	COPY	Copied from primary image.
Instance Number	0020,0013	IS		ALWAYS	COPY	Copied from primary image.
Content Date	0008,0023	DT		ALWAYS	COPY	Copied from primary image.
Content Time	0008,0033	TM		ALWAYS	COPY	Copied from primary image.
Number of Frames	0028,0008	IS		ALWAYS	COPY	Copied from primary image.
Pixel Measures Sequence	0028,9110	SQ		ALWAYS	COPY	Copied from primary image.
>Pixel Spacing	0028,0030	DS		ALWAYS	COPY	Copied from primary image.
>Slice Thickness	0018,0050	DS		ALWAYS	COPY	Copied from primary image.

Table 78: X-Ray 3D Image Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS	DERIVED\SECONDARY\TO MOSYNTHESIS\GENERATED_2D	ALWAYS	COPY	Copied from primary image
Pixel Presentation	0008,9205	CS	MONOCHROME	ALWAYS	COPY	Copied from primary image
Volumetric Properties	0008,9206	CS		ALWAYS	COPY	Copied from primary image
Volume Based Calculation Technique	0008,9207	CS		ALWAYS	COPY	Copied from primary image
Content Qualification	0018,9004	CS		ALWAYS	COPY	Copied from primary image
Samples per Pixel	0028,0002	US		ALWAYS	COPY	Copied from primary image
Photometric Interpretation	0028,0004	CS		ALWAYS	COPY	Copied from primary image
Bits Allocated	0028,0100	US		ALWAYS	COPY	Copied from primary image
Bits Stored	0028,0101	US		ALWAYS	COPY	Copied from primary image
High Bit	0028,0102	US		ALWAYS	COPY	Copied from primary image
Burned In Annotation	0028,0301	CS		ALWAYS	COPY	Copied from primary image
Lossy Image Compression	0028,2110	CS		ALWAYS	COPY	Copied from primary image

Presentation LUT Shape	2050,0020	CS		ALWAYS	COPY	Copied from primary image
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Table 79: Breast Tomosynthesis Contributing Sources Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contributing Sources Sequence	0018,9506	SQ		ALWAYS	COPY	Copied from primary image.
>Acquisition Datetime	0008,002A	DT		ALWAYS	COPY	Copied from primary image.
>Manufacturer	0008,0070	LO		VNAP	COPY	Copied from primary image.
>Station Name	0008,1010	SH		VNAP	COPY	Copied from primary image.
>Operators' Name	0008,1070	PN		VNAP	COPY	Copied from primary image.
>Manufacturer's Model Name	0008,1090	LO		VNAP	COPY	Copied from primary image.
>Device Serial Number	0018,1000	LO		VNAP	COPY	Copied from primary image.
>Software Version(s)	0018,1020	LO		VNAP	COPY	Copied from primary image.
>Protocol Name	0018,1030	LO		VNAP	COPY	Copied from primary image.
>Detector Type	0018,7004	CS		VNAP	COPY	Copied from primary image.
>Detector ID	0018,700A	SH		VNAP	COPY	Copied from primary image.
>Date of Last Detector Calibration	0018,700C	DA		VNAP	COPY	Copied from primary image.
>Time of Last Detector Calibration	0018,700E	TM		VNAP	COPY	Copied from primary image.
>Detector Element Spacing	0018,7022	DS		VNAP	COPY	Copied from primary image.
>Rows	0028,0010	US		VNAP	COPY	Copied from primary image.
>Columns	0028,0011	US		VNAP	COPY	Copied from primary image.
>Bits Stored	0028,0101	US		VNAP	COPY	Copied from primary image.
>Lossy Image Compression	0028,2110	CS		VNAP	COPY	Copied from primary image.

Table 80: Breast Tomosynthesis Acquisition Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Contributing Sources Sequence	0018,9506	SQ		ALWAYS	COPY	Copied from primary image.
>Acquisition Datetime	0008,002A	DT		ALWAYS	COPY	Copied from primary image.
>Manufacturer	0008,0070	LO		ALWAYS	COPY	Copied from primary image.
>Station Name	0008,1010	SH		ALWAYS	COPY	Copied from primary image.
>Operators' Name	0008,1070	PN		ALWAYS	COPY	Copied from primary image.
>Manufacturer's Model Name	0008,1090	LO		ALWAYS	COPY	Copied from primary image.
>Device Serial Number	0018,1000	LO		ALWAYS	COPY	Copied from primary image.
>Software Version(s)	0018,1020	LO		ALWAYS	COPY	Copied from primary image.
>Protocol Name	0018,1030	LO		ALWAYS	COPY	Copied from primary image.
>Detector Type	0018,7004	CS		ALWAYS	COPY	Copied from primary image.
>Detector ID	0018,700A	SH		ALWAYS	COPY	Copied from primary image.
>Date of Last Detector Calibration	0018,700C	DA		ALWAYS	COPY	Copied from primary image.
>Time of Last Detector Calibration	0018,700E	TM		ALWAYS	COPY	Copied from primary image.
>Detector Element Spacing	0018,7022	DS		ALWAYS	COPY	Copied from primary image.
>Rows	0028,0010	US		ALWAYS	COPY	Copied from primary image.
>Columns	0028,0011	US		ALWAYS	COPY	Copied from primary image.
>Bits Stored	0028,0101	US		ALWAYS	COPY	Copied from primary image.

>Lossy Image Compression	0028,2110	CS		ALWAYS	COPY	Copied from primary image.
X-Ray 3D Acquisition Sequence	0018,9507	SQ		ALWAYS	COPY	Copied from primary image.
>Source Image Sequence	0008,2112	SQ		ALWAYS	COPY	Copied from primary image.
> KVP	0018,0060	DS		ALWAYS	COPY	Copied from primary image.
> Distance Source to Detector	0018,1110	DS		ALWAYS	COPY	Copied from primary image.
> Distance Source to Patient	0018,1111	DS		ALWAYS	COPY	Copied from primary image.
> Estimated Radiographic Magnification Factor	0018,1114	DS		ALWAYS	COPY	Copied from primary image.
> Field of View Shape	0018,1147	CS		ALWAYS	COPY	Copied from primary image.
> Filter Type	0018,1160	SH		ALWAYS	COPY	Copied from primary image.
> Grid	0018,1166	CS		ALWAYS	COPY	Copied from primary image.
> Focal Spot(s)	0018,1190	DS		ALWAYS	COPY	Copied from primary image.
> Anode Target Material	0018,1191	CS		ALWAYS	COPY	Copied from primary image.
> Body Part Thickness	0018,11A0	DS		ALWAYS	COPY	Copied from primary image.
>Compression Force	0018,11A2	DS		ALWAYS	COPY	Copied from primary image.
>Paddle Description	0018,11A4	LO		ALWAYS	COPY	Copied from primary image.
>Detector Temperature	0018,7001	DS		ALWAYS	COPY	Copied from primary image.
>Detector Binning	0018,701A	DS		ALWAYS	COPY	Copied from primary image.
>Field of View Origin	0018,7030	DS		ALWAYS	COPY	Copied from primary image.
>Field of View Rotation	0018,7032	DS		ALWAYS	COPY	Copied from primary image.
>Field of View Horizontal Flip	0018,7034	CS		ALWAYS	COPY	Copied from primary image.
>Filter Material	0018,7050	CS		ALWAYS	COPY	Copied from primary image.
>Filter Thickness Minimum	0018,7052	DS		ALWAYS	COPY	Copied from primary image.
>Filter Thickness Maximum	0018,7054	DS		ALWAYS	COPY	Copied from primary image.
>Exposure Control Mode	0018,7060	CS		ALWAYS	COPY	Copied from primary image.
>Exposure Control Mode Description	0018,7062	LT		ALWAYS	COPY	Copied from primary image.
>Exposure Time in ms	0018,9328	FD		ALWAYS	COPY	Copied from primary image.
>X-Ray Tube Current in mA	0018,9330	FD		ALWAYS	COPY	Copied from primary image.
>Exposure in mAs	0018,9332	FD		ALWAYS	COPY	Copied from primary image.
>X-Ray Receptor Type	0018,9420	CS		ALWAYS	COPY	Copied from primary image.
>Field of View Dimension(s) in Float	0018,9461	FL		ALWAYS	COPY	Copied from primary image.
>Primary Positioner Scan Arc	0018,9508	FL		ALWAYS	COPY	Copied from primary image.
>Primary Positioner Scan Start Angle	0018,9510	FL		ALWAYS	COPY	Copied from primary image.
>Primary Positioner Increment	0018,9514	DL		ALWAYS	COPY	Copied from primary image.
>Start Acquisition Datetime	0018,9516	DT		ALWAYS	COPY	Copied from primary image.
>Organ Dose	0040,0316	DS		ALWAYS	COPY	Copied from primary image.
>Entrance Dose in mGy	0040,8302	DS		ALWAYS	COPY	Copied from primary image.
>Per Projection Acquisition Sequence	0018,9538	SQ		ALWAYS	COPY	Copied from primary image.
>>KVP	0018,0060	DS		ALWAYS	COPY	Copied from primary image.
>>Relative X-ray Exposure	0018,1405	IS		ALWAYS	COPY	Copied from primary image.
>>Positioner Primary Angle	0018,1510	DS		ALWAYS	COPY	Copied from primary image.
>>Collimator Shape	0018,1700	CS		ALWAYS	COPY	Copied from primary image.
>>Collimator Left Vertical Edge	0018,1702	IS		ALWAYS	COPY	Copied from primary image.
>> Collimator Right Vertical Edge	0018,1704	IS		ALWAYS	COPY	Copied from primary image.

>> Collimator Upper Horizontal Edge	0018,1706	IS		ALWAYS	COPY	Copied from primary image.
>>Collimator Lower Horizontal Edge	0018,1708	IS		ALWAYS	COPY	Copied from primary image.
>>Frame Acquisition Duration	0018,9220	FD		ALWAYS	COPY	Copied from primary image.
>>Exposure Time in ms	0018,9328	FD		ALWAYS	COPY	Copied from primary image.
>> X-Ray Tube Current in mA	0018,9330	FD		ALWAYS	COPY	Copied from primary image.
>>Exposure in mAs	0018,9332	FD		ALWAYS	COPY	Copied from primary image.
>>Organ Dose	0040,0316	DS		ALWAYS	COPY	Copied from primary image.
>>Entrance Dose in mGy	0040,8302	DS		ALWAYS	COPY	Copied from primary image.

Table 81: X-Ray 3D Reconstruction Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
X-Ray 3D Reconstruction Sequence	0018,9530	SQ		ALWAYS	COPY	Copied from primary image
> Application Name	0018,9524	LO	IntelliSpace Radiology	ALWAYS	COPY	Copied from primary image
> Application Version	0018,9525	LO	Version 4.7.0.0 Build 4.7.1078.0	ALWAYS	COPY	Copied from primary image
> Application Manufacturer	0018,9526	LO	Philips	ALWAYS	COPY	Copied from primary image
> Algorithm Type	0018,9527	CS		ALWAYS	COPY	Copied from primary image
> Reconstruction Description	0018,9531	LO		ANAP	COPY	Copied from primary image
> Acquisition Index	0020,9518	US		ALWAYS	COPY	Copied from primary image

Table 82: Breast View Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Image Type	0008,0008	CS		ALWAYS	COPY	Copied from primary image
Breast Implant Present	0028,1300	CS		ALWAYS	AUTO	
View Code Sequence	0054,0220	SQ		ALWAYS	COPY	Copied from primary image
>View Modifier Code Sequence	0054,0222	SQ		VNAP	COPY	Copied from primary image
>>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image
>Code Value	0008,0100	SH		ALWAYS	COPY	Copied from primary image
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	Copied from primary image
>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image

Table 83: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
SOP Class UID	0008,0016	UI		ALWAYS	AUTO	
SOP Instance UID	0008,0018	UI		ALWAYS	AUTO	
Specific Character Set	0008,0005	CS		ALWAYS	COPY	Copied from primary image.

Table 84: Private/ Additional Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ALWAYS	COPY	

Patient Orientation	0020,0020	CS		ALWAYS	COPY	
Image Orientation (Patient)	0020,0037	DS		ALWAYS	COPY	
Window Center	0028,1050	DS		ALWAYS	COPY	
Window Width	0028,1051	DS		ALWAYS	COPY	
Study Status ID	0032,000A	CS		ALWAYS	COPY	
Irradiation Event UID	0008,3010	UI		ALWAYS	AUTO	
Requesting Physician	0032,1032	PN		ALWAYS	COPY	Copied from primary image
Performed Procedure Step Start Date	0040,0244	DA		ALWAYS	AUTO	
Performed Procedure Step Start Time	0040,0245	TM		ALWAYS	AUTO	
Performed Procedure Step Description	0040,0254	LO		ALWAYS	AUTO	
Performed Protocol Code Sequence	0040,0260	SQ		ALWAYS	COPY	Copied from primary image
>Code Value	0008,0100	SH		ALWAYS	COPY	Copied from primary image
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	Copied from primary image
>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image
View Code Sequence	0054,0220	SQ		ALWAYS	COPY	Copied from primary image
>Code Value	0008,0100	SH		ALWAYS	COPY	Copied from primary image
>Coding Scheme Designator	0008,0102	SH		ALWAYS	COPY	Copied from primary image
>Code Meaning	0008,0104	LO		ALWAYS	COPY	Copied from primary image
Acquisition Date	0008,0022	DA		ALWAYS	COPY	Copied from primary image
Acquisition Time	0008,0032	TM		ALWAYS	COPY	Copied from primary image
Patient Orientation	0020,0020	CS		ALWAYS	COPY	Copied from primary image
Image Laterality	0020,0062	CS		ALWAYS	COPY	Copied from primary image
Requested Procedure ID	0040,1001	SH		ALWAYS	COPY	Copied from primary image
Requested Procedure Description	0032,1060	LO		ALWAYS	COPY	Copied from primary image
Requested Procedure Code Sequence	0032,1064	SQ		ALWAYS	COPY	Copied from primary image
Procedure Code Sequence	0008,1032	SQ		ALWAYS	COPY	Copied from primary image
Private	0073,0010	LO		ALWAYS	COPY	Copied from primary image
Private	0073,1002	UT		ALWAYS	COPY	Copied from primary image
Private	0073,1003	UT		ALWAYS	COPY	Copied from primary image
Private	0073,1004	UT		ALWAYS	COPY	Copied from primary image
Private	0073,1006	LO		ALWAYS	COPY	Copied from primary image

8.1.1.5. Key Object Selection Document Storage SOP Class

The supported Module and their tags are mentioned below.

Table 85: Key Object Selection Document Storage SOP Class - Supported Modules

Information Entity	Module	Presence Of Module
Patient	Patient	ALWAYS
Study	General Study	ALWAYS
Series	Key Object Document Series	ALWAYS
Equipment	General Equipment	ALWAYS
Document	Key Object Document	ALWAYS
	SR Document Content	ALWAYS

SOP Common

ALWAYS

Table 86: Patient Module

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

Table 87: General Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Study Date	0010,0010	PN		VNAP	COPY	Copied from primary image
Study Time	0008,0030	TM		VNAP	COPY	Copied from primary image
Accession Number	0008,0050	SH		VNAP	COPY	Copied from primary image
Referring Physician's Name	0008,0090	PN		VNAP	COPY	Copied from primary image
Study Description	0008,1030	LO		VNAP	COPY	Copied from primary image
Study Instance UID	0020,000D	UI		VNAP	COPY	Copied from primary image
Study ID	0020,0010	SH		VNAP	COPY	

Table 88: Patient Study Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Patient's Weight	0010,1030	DS		VNAP	COPY	Copied from primary image

Table 89: Key Object Document Series Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Referenced Performed Procedure Step Sequence	0008,1111	SQ		VNAP	AUTO	
Modality	0008,0060	CS	KO	VNAP	FIXED	
Series Description	0008,103E	LO		VNAP	AUTO	
Series Instance UID	0020,000E	UI		VNAP	AUTO	
Series Number	0020,0011	IS		VNAP	AUTO	

Table 90: General Equipment Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Manufacturer	0008,0070	LO		ALWAYS	FIXED	Philips
Station Name	0008,1010	SH		ALWAYS	FIXED	<hostname>
Manufacturer's Model Name	0008,1090	LO		ALWAYS	FIXED	IntelliSpace Radiology
Software Version(s)	0018,1020	LO		ALWAYS	FIXED	Version 4.7.0.0 Build 4.7.1078.0

Table 91: Key Object Document Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Content Date	0008,0023	DA		ALWAYS	AUTO	
Content Time	0008,0033	TM		ALWAYS	AUTO	
Instance Number	0020,0013	IS		ALWAYS	AUTO	
Current Requested Procedure Evidence Sequence	0040,A375	SQ		ALWAYS	COPY	
>Referenced Series Sequence	0008,1115	SQ		ALWAYS	AUTO	
>>Referenced SOP Sequence	0008,1199	SQ		ALWAYS	AUTO	
>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>>Referenced SOP Sequence	0008,1199	SQ		ALWAYS	AUTO	
>>>Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	
>>Series Instance UID	0020,000E	UI		ALWAYS	AUTO	
>Study Instance UID	0020,000D	UI		ALWAYS	AUTO	

Table 92: SR Document Content Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Value Type	0040,A040	CS		ALWAYS	AUTO	
Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
> Code Value	0008,0100	SH		ALWAYS	AUTO	
> Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
> Code Meaning	0008,0104	LO		ALWAYS	AUTO	
Continuity of Content	0040,A050	CS		ALWAYS	AUTO	
Content Template Sequence	0040,A504	SQ		ALWAYS	AUTO	
>Mapping Resource	0008,0105	CS		ALWAYS	AUTO	
>Template Identifier	0040,DB00	CS		ALWAYS	AUTO	
Content Sequence	0040,A730	SQ		ALWAYS	AUTO	
>Relationship Type	0040,A010	CS		ALWAYS	AUTO	
>Value Type	0040,A040	CS		ALWAYS	AUTO	
>Concept Name Code Sequence	0040,A043	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Concept Code Sequence	0040,A168	SQ		ALWAYS	AUTO	
>>Code Value	0008,0100	SH		ALWAYS	AUTO	
>>Coding Scheme Designator	0008,0102	SH		ALWAYS	AUTO	
>>Code Meaning	0008,0104	LO		ALWAYS	AUTO	
>Referenced SOP Sequence	0008,1199	SQ		ALWAYS	AUTO	
>> Referenced SOP Class UID	0008,1150	UI		ALWAYS	AUTO	
>>Referenced SOP Instance UID	0008,1155	UI		ALWAYS	AUTO	

Table 93: SOP Common Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Specific Character Set	0008,0005	CS		VNAP	COPY	Copied from primary image
Instance Creation Date	0008,0012	DT		VNAP	COPY	Copied from primary image
Instance Creation Time	0008,0013	TM		VNAP	COPY	Copied from primary image
SOP Class UID	0008,0016	UI		ALWAYS	COPY	Copied from primary image
SOP Instance UID	0008,0018	UI		ALWAYS	COPY	Copied from primary image
Instance Number	0020,0013	IS		ALWAYS	COPY	Copied from primary image

Table 94: Private/ Additional Module

Attribute Name	Tag	VR	Value	Presence of Value	Source	Comment
Other Patient IDs	0010,1000	LO		ANAP		
Content Label	0070,0080	CS		ALWAYS	FIXED	
Content Description	0070,0081	LO		ALWAYS	FIXED	
Private	0073,0010	LO		ALWAYS	FIXED	"STENTOR"
Private	0073,1002	UT		ALWAYS	COPY	
Private	0073,1003	UT		ALWAYS	COPY	
Private	0073,1004	UT		ALWAYS	COPY	
Private	0073,1006	LO		ALWAYS	FIXED	

8.1.2. Usage of Attributes from Received IOD

8.1.2.1. IntelliSpace Radiology Viewer

The IntelliSpace Radiology viewer can display images for the image SOP Classes as defined by the column 'Display' in Table 1.

8.1.2.1.1. Limitation for Softcopy Presentation State Storage SOP Class

Presentation States are translated and displayed on the IntelliSpace Radiology Viewer with some limitations as described in this section.

Explanation of the values used in the column "Implemented for Viewing" of table below:

- Yes All Type 1/1C and Type 2/2C tags are supported.
- No This feature is not provided and/or the required information is not available.
- Partial Some tags are supported.

Table 95: IOD of Used Softcopy Presentation State Storage SOP Class – Support for Loading

Module	Implemented for Viewing
Patient Module	yes
Clinical Trial Subject Module	no
General Study	yes
Patient Study Module	no
Clinical Trail Study Module	no
General Series Module	yes
Clinical Trail Series Module	no
Presentation Series Module	yes
General Equipment Module	yes

Module	Implemented for Viewing
Presentation State Identification Module	yes
Presentation State Relationship Module	partial
Presentation State Shutter Module	no
Presentation State Mask Module	no
Mask Module	no
Display Shutter Module	partial
Bitmap Display Module	no
Overlay Plane Module	yes
Overlay Activation Module	yes
Displayed Area Module	no
Graphic Annotation Module	partial
Spatial Transformation Module	yes
Graphic Layer Module	yes
Modality LUT Module	partial
Softcopy VOI LUT Module	partial
Softcopy Presentation LUT Module	partial
SOP Common Module	partial

Note: The supported modules and their tags for the loaded GSPS are described together with the Supported GSPS Created. Whenever there is a difference in the support of a module or a tag in the module for GSPS Loading and Creation, the differences are described in the section 8.1.1.2.

8.1.3. Attribute Mapping

Not applicable.

8.1.4. Coerced/Modified fields

Not applicable.

8.2. Data Dictionary of Private Attributes

The following are the IntelliSpace Radiology private attributes:

Table 96: Data Dictionary Of Private Attributes

Tag	Attribute Name	VR	VM	Attribute Description	Location
(0073, 0010)	Philips Private Creator	ST	1	A private tag placeholder : "STENTOR"	Study level of a study's composite
(0073, 1001)	Stentor Sending Hostname Element	ST	1	Hostname used for sending	Study level of a study's composite
(0073, 1002)	Stentor Remote IP-Address Element	ST	1	Stores the remote IP-address of where the study came from	Study level of a study's composite
(0073, 1003)	Stentor Remote AETitle Element	ST	1	Stores the remote AE-Title of where the study came from	Study level of a study's composite
(0073, 1004)	Stentor Local AETitle Element	ST	1	Name/Value of local AE-Title	Study level of a study's composite
(0073, 1005)	IntelliSpace PS Key Image Flag	ST	1	Stores in IntelliSpace Presentation State to indicate whether the given image is a key image	Instance level

Tag	Attribute Name	VR	VM	Attribute Description	Location
(0073, 1006)	IntelliSpace PS Number of Length Measurements	US	1	Store in presentation state the number of length measurements that have been defined by the user	Instance level
(0073, 1007)	Series Clone ID	SS	1	Present if the series represents a clone. It stores the ID of the clone.	Instance level
(0073, 1008)	Series Clone from Window Number	SS	1	Present if the series represents a clone. It stores the window number from which this series was cloned.	Instance level
(0073, 1009)	Number of Clones of a series	SS	1	Stores the number of clones of a series.	Instance level
(0073, 101A)	Message Response Description	LT	1	Stores a description about the response.	Study level
(0073, 101B)	Study Date Update	LT	1	Stores that the study date is updated	Study level
(0073, 101C)	Study Time Update	LT	1	Stores that the study time is updated.	Study level
(0073, 101D)	IntelliSpace PS Version	LT	1	Stores the IntelliSpace private presentation state version.	Instance level
(0073, 101E)	Embedded IntelliSpace PS	UT	1	The IntelliSpace private Presentation State data - Serialized IntelliSpacePS xml	RAWDATA Extended SOP Class for exporting IntelliSpace private Presentation State
(0073, 101F)	IntelliSpace Presentation Type	UT	1	Protocol Name "Technologist"= PSDescriptor::Technologist "Radiologist"= PSDescriptor::Radiologist "PreRead"= PSDescriptor::PreRead "User"= PSDescriptor::User "Conference"= PSDescriptor::Conference "ReferenceCPS"= PSDescriptor::ReferenceCPS	RAWDATA Extended SOP Class for exporting IntelliSpace private Presentation State
(0073, 1020)	IntelliSpace PS Modifier Name	LT	1	Stores the name of the modifier of the PS	Series level
(0073, 1021)	IntelliSpace PS Modification Date	LT	1	Stored the date when PS is modified	Series level
(0073, 1022)	IntelliSpace PS Modification Time	LT	1	Stored the time when PS is modified	Series level
(0073, 1023)	Current Image Frame	US	1	Stores the currently displayed frame for multi-frame image	Series level
(0073, 1024)	UTC Offset	SS	1	Stores the UTC offset	Study level
(0073, 1025)	Exam Body Part	LO	1	Stores the exam body part	Study level
(0073, 1026)	Exam Modality	LO	1	Stores the exam modality	Study level
(0073, 1027)	Exam Code	LO	1	Stores the exam code	Study level
(0073, 102C)	Alternative Patient ID	LO	1	Stores alternative patient ID sequence	Study level
(0073, 102D)	Study Complete Flag	LO	1	Stores the study complete flag	Study level
(0073, 102E)	Filler Order ID	LO	1	Stores the Filler Order ID	Study level
(0073, 102F)	XDS Study ID	LO	1	Stores the XDS study ID	Study level
(0073, 1030)	IntelliSpace PS Version	ST	1	stores the version of the IntelliSpace private presentation state data in (0073,101E)	Used for GSPS that contains the IntelliSpace private PS
(0073, 1031)	IntelliSpace PS Collection Window Information	SQ	1	Stores the collection window information into presentation state	Study level
(0073, 1032)	Collection Window Type	ST	1	Stores the type if the collection window	Study level
(0073, 1033)	Collection Data	SQ	1	Stores the collection specific data within the collection sequence	Study level

Tag	Attribute Name	VR	VM	Attribute Description	Location
(0073, 2000)	IntelliSpace PS Annotation Graphics Type	ST	1	Stores in presentation state the kind of annotation that is defined by the given graphic objects	Instance level
(0073, 2001)	IntelliSpace PS Annotation Font	ST	1	Stores in presentation state the font used for the annotation	Instance level
(0073, 2002)	IntelliSpace PS Annotation Line Style	ST	1	Stores in presentation state the line style used for the annotation	Instance level
(0073, 2003)	IntelliSpace PS Annotation Line Size	ST	1	Stores in presentation state the line size used for the annotation	Instance level
(0073, 2004)	IntelliSpace PS Column Pixel Spacing	FL	1	Store in presentation state the column pixel spacing for a manual calibration	Instance level
(0073, 2005)	IntelliSpace PS Row Pixel Spacing	FL	1	Store in presentation state the row pixel spacing for a manual calibration	Instance level
(0073, 2006)	IntelliSpace PS Annotation Modifiable	US	1	Stores in presentation state whether the annotation is modifiable	Instance level
(0073, 2007)	IntelliSpace PS Secondary graphics elements	SQ	1	Stores in presentation state secondary line information, including line style, line size and line color.	Instance level
(0073, 2008)	IntelliSpace PS Annotation Line Color	ST	1	Stores in presentation state the line color used for the annotation	Instance level
(0073, 2009)	IntelliSpace PS Graphics filled	ST	1	Stores in presentation state whether the graphics is filled	Instance level
(0073, 2010)	IntelliSpace PS Graphics Layer	ST	1	Stores in presentation state the graphics layer	Instance level

8.3. Coded Terminology and Templates

Not applicable.

8.3.1. Context Groups

Not applicable.

8.3.2. Template Specifications

Not applicable.

8.3.3. Private code definitions

Not applicable.

8.4. Grayscale Image consistency

The high resolution display monitor attached to the product can be calibrated according to the Grayscale Standard Display Function (GSDF). The service/Installation Tool is used together with a luminance meter to measure the Characteristic Curve of the display system and the current ambient light. See the product Service Manual for details on the calibration procedure and supported calibration hardware. The result of the calibration procedure is a Monitor Correction LUT that will be active within the display subsystem after a system reboot.

8.5. Standard Extended/Specialized/Private SOPs

8.5.1. Standard Extended SOP's

The Raw Data Storage SOP Class – UID: 1.2.840.10008.5.1.4.1.1.66 is extended for exporting the IntelliSpace Radiology Private Presentation State.

The SOP Class defines the usage of it for embedding the IntelliSpace Radiology Presentation State, by the Creator-Version UID tag (0008,9123) with the defined value: 1.3.46.670589.42.100.1

The following set of mandatory DICOM attributes (type 1 and 2) will be populated in this extended DICOM Raw Object:

Table 97: Mandatory DICOM attributes (type 1 and 2)

DICOM Raw Data element	Name	Description
Patient		
0010,0010	Patient's Name	Patient's full name.
0010,0020	Patient ID	Primary hospital identification number or code for the patient.
0010,0030	Patient's Birth Date	Birth date of the patient.
0010,0040	Patient's Sex	Sex of the named patient.
Study		
0008,0020	Study Date	Date the Study started.
0008,0030	Study Time	Time the Study started.
0008,0050	Accession Number	A RIS generated number that identifies the order for the Study.
0008,0090	Referring Physician's Name	Name of the patient's referring physician
0020,000D	Study Instance UID	Unique identifier for the Study.
0020,0010	Study ID	User or equipment generated Study identifier.
Series		
0008,0060	Modality	Defined term for the modality
0020,000E	Series Instance UID	Unique identifier of the Series. Taken from the IntelliSpace PS
0020,0011	Series Number	A number that identifies this Series.
Equipment		
0008,0070	Manufacturer	Manufacturer of the equipment that produced the composite instances.
Raw Data		
0008,0016	SOP Class UID	Uniquely identifies the SOP Class.
0008,0018	SOP Instance UID	Uniquely identifies the SOP Instance.
0008,0023	Content Date	The date the raw data creation was started.
0008,0033	Content Time	The time the raw data creation was started.
0008,9123	Creator-Version UID	Unique identification of the equipment and version of the software that has created the Raw Data information. The UID allows one to avoid attempting to interpret raw data with an unknown format.
0020,0013	Instance Number	A number that identifies this raw data. The value can be unique within a series.
0040,0555	Acquisition Context Sequence	A sequence of Items that describes the conditions present during the acquisition of the data of the SOP Instance. Zero or more items may be included in this sequence.

The following tags will be added to the DICOM Raw Data Object as the *content* of the IntelliSpace PS. The full IntelliSpace PS is present.

Table 98: Raw Data Tags containing the IntelliSpace PS data

Raw Data Tag	Description	IntelliSpace PS source tag	Description
0070,0080	DICOM Content Level	0070,0080	Content Label
0070,0081	DICOM Content Description	0070,0081	Content Description
0070,0082	Presentation Creation Date	0070,0082	Presentation Creation Date
0070,0083	Presentation Creation Time	0008,0013	Instance Creation Time of SOP Instance
0070,0084	Content Creator Name	0008,1070	Operators Name

0073,101E (String)	Embedded IntelliSpace PS	N.A.	Serialized IntelliSpacePS xml
0073,101F (String)	IntelliSpace Presentation type	0018,1030	Protocol Name "Technologist"= PSDescriptor::Technologist "Radiologist"= PSDescriptor::Radiologist "PreRead"= PSDescriptor::PreRead "User"= PSDescriptor::User "Conference"= PSDescriptor::Conference "ReferenceCPS"= PSDescriptor::ReferenceCPS

8.5.2. Standard Specialized SOP's

None.

8.5.3. Private SOP's

None.

8.6. Private Transfer Syntaxes

Not applicable.