DICOM Conformance Statement

Sectra PACS and Sectra Open Archive

Version 15.2, November 2013

SECTRA

About this document

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Contents

1 Introduction

The following topics are included in this chapter:

This document will describe the DICOM support of Sectra PACS and Sectra Open Archive

1.1 Related Documents

[1] Digital Imaging and Communications in Medicine (DICOM). NEMA Standard Publications PS 3.1-16 and Supplements.

[2] Installation Guide IDS5

[3] System Administrator's Guide IDS5

[4] User's Guide IDS5

[5] User's Guide IDS7

[6] Installation Guide WISE HP-UX

[7] System Administrator's Guide WISE HP-UX

[8] Installation Guide ImageServer/s HP-UX

[9] System Administrators's Guide ImageServer/s HP-UX

[10] Installation Guide WISE Win

[11] System Administrator's Guide WISE Win

[12] Installation Guide ImageServer/fs & ImageServer/xd HP-UX

[13] System Administrator's Guide ImageServer/fs, ImageServer/xd

[14] Installation Guide ImageServer/fs & ImageServer/xd Win

[15] Release Notes Sectra PACS Clinical Edition

[16] User's Guide IDS7

[17] System Administrator's Guide Sectra Healthcare System

Note: Depending on the Sectra solution you are running, referenced documents may or may not be available to you.

1.2 Products and architecture

The architecture and components of Sectra PACS and Sectra Open Archive are described in System Administrator's Guide Sectra Healthcare System [17].

Some server components can either be installed on Microsoft Windows (WISE (win)) Server or HP-UX (WISE (UNIX)).

Warning: There are some differences in functionality between WISE (win) and WISE (UNIX), hence it is recommended to carefully read this document and do not make assumptions about functionality on different platforms.

1.3 DICOM Standard

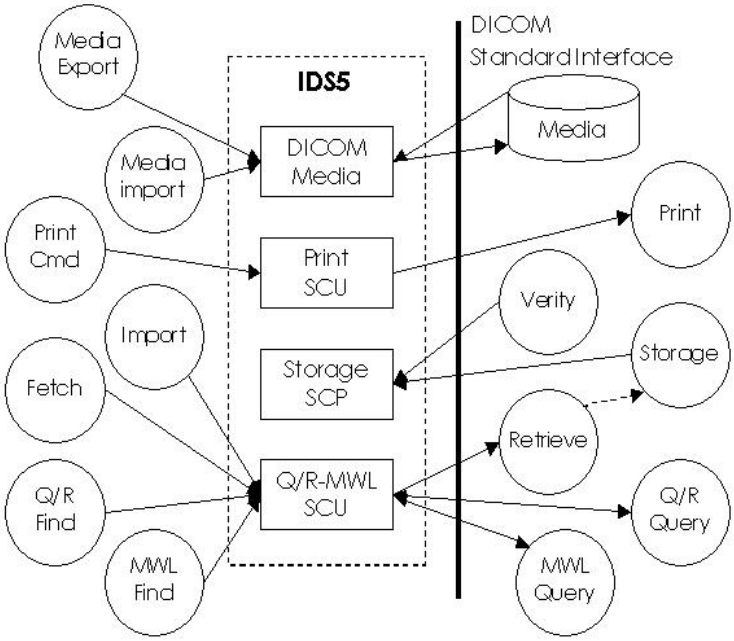
This document should be read together with the DICOM standard Digital Imaging and Communications in Medicine (DICOM). NEMA Standard Publications PS 3.1-16 and Supplements. [1]. Definitions and terms are used in this document according to the DICOM standard. It is assumed that the reader is familiar with the DICOM standard.

2 Implementation model

The following topics are included in this chapter:

2.1 Application Data Flow Diagram

2.1.1 IDS5 Application Flow Diagram

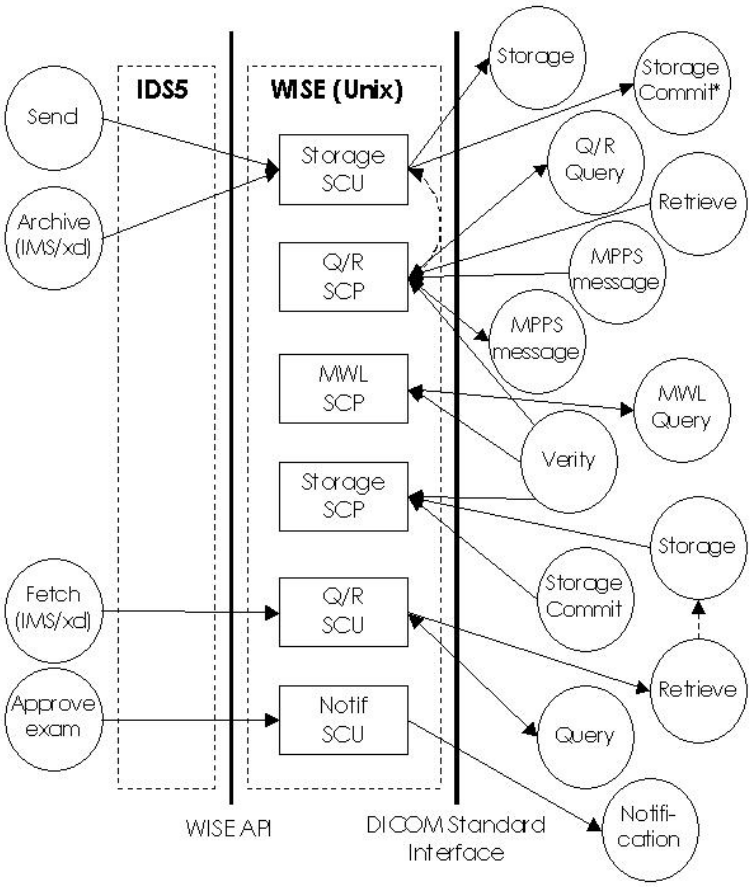


IDS5 is a multi-modality viewing station for DICOM images. It provides (among other things) the following features:

- Store and retrieve of images stored on a CD media.
- Reply on communication tests from remote applications.
- Print images.
- Query a remote application (typically a Radiology Information System, RIS) for a modality work list.
- Query a remote application (typically a DICOM archive) for images and other objects.

- View images fetched to a temporary location from a remote application.
- Import images from a remote application to WISE.
- IDS5 contains four different Application Entities (AE), DICOM Media, Print SCU, Storage SCP and Q/R-MWL SCU.
- Each AE only has one instance.
- DICOM Media functionality is described separately in chapter 6.

2.1.2 WISE (UNIX) Application Flow Diagram



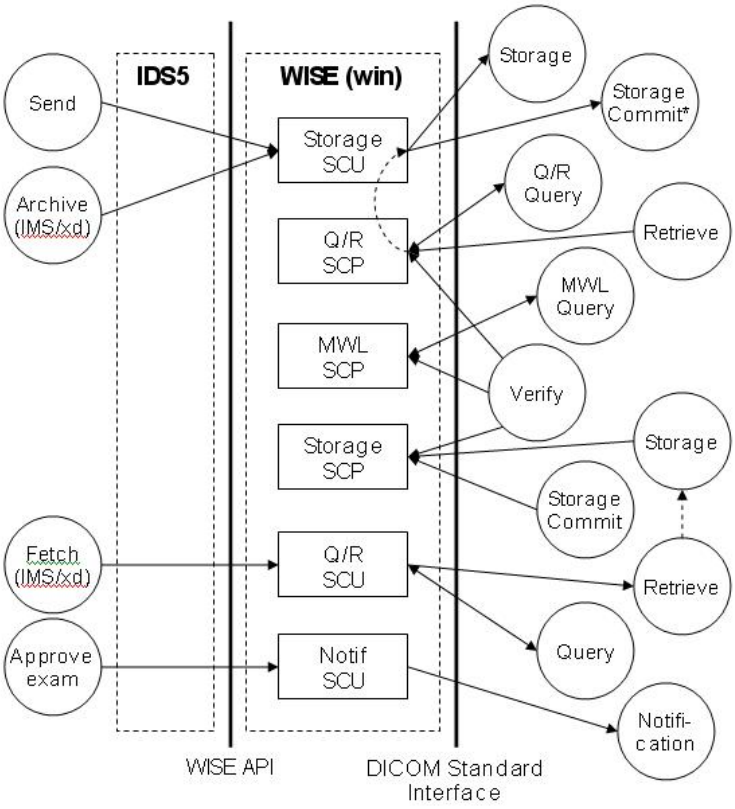
* Only ImageServer/xd

WISE (UNIX) provides (among other things) the following features:

- It replies on communication tests from remote applications.
- It allows remote applications (typically modalities and workstations) to send images to it.
- It allows remote applications to commit storage of sent images.
- It allows remote applications to query the WISE database and retrieve images.
- It handles incoming messages about Performed Procedure Steps and relay this information to other applications.

- Send images to remote applications (typically workstations or DICOM archives).
- Fetch images from remote applications (typically a DICOM archive)
- Approve exams, which will generate a Study Content Notification.
- It allows remote applications to query the WISE database for worklists.
- WISE (UNIX) contains six different Application Entities (AE), Storage SCU, Q/R SCP, Storage SCP, Q/R SCU, Notif SCU and MWL SCP.
- Each AE only has one instance except for Storage SCP, Q/R SCP and MWL SCP which can have many instances.

2.1.3 WISE (win) Application Flow Diagram



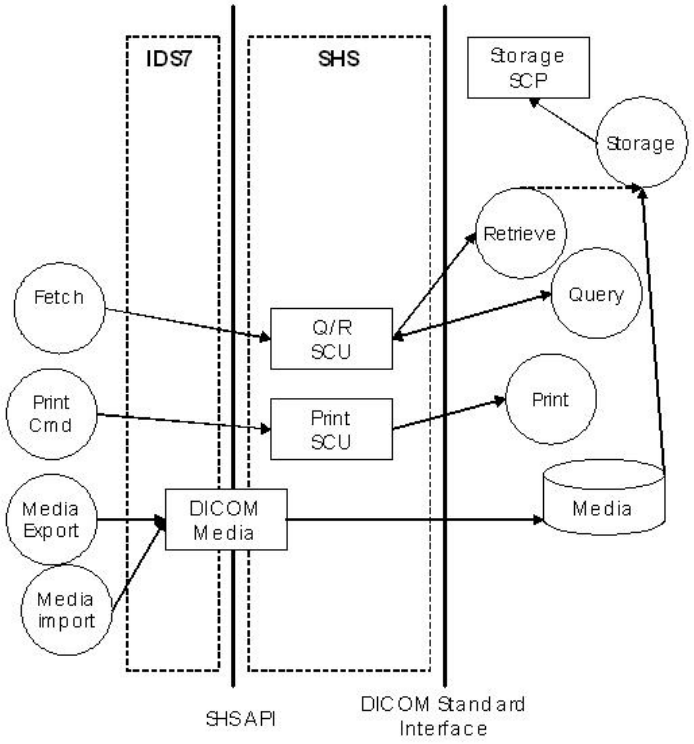
* Only ImageServer/xd

WISE (win) provides (among other things) the following features:

- It replies on communication tests from remote applications.
- It allows remote applications (modalities and image workstations) to send images to it.
- It allows remote applications to commit storage of sent images.
- It allows remote applications to query the WISE database and retrieve images.
- Send images to a remote application (e.g. a workstation or a DICOM archive).

- Fetch images from remote applications (typically a DICOM archive)
- Approve exams, which will generate a Study Content Notification.
- It allows remote applications to query the WISE database for worklists.
- WISE (win) contains six different Application Entities (AE), Storage SCU, Q/R SCP, Storage SCP, Q/R SCU, Notif SCU and MWL SCP
- Each AE only has one instance except for Storage SCP, Q/R SCP and MWL SCP which can have many instances.

2.1.4 SHS Application Flow Diagram



SHS provides (among other things) the following features:

- Store and retrieve of images stored on a CD media. Media import and export is residing on IDS7. Media export is also an operation on SHS when CD/DVD Production Center is used.
- Print images.
- Send images to a remote application (e.g. a workstation or a DICOM archive) via WISE.
- Fetch images from remote applications (typically a DICOM archive) via WISE.
- SHS contains one Application Entity (AE), Q/R SCU which only has one instance.

2.2 Functional Definitions of AEs

2.2.1 General - Storage SOP Classes

The following table lists all Storage SOP Classes supported by different application entities covered by this Conformance Statement.

Table 2.1 List of supported Storage SOP classes

SOP Class Name	SOP Class UID
Stored Print Storage (Retired)	1.2.840.10008.5.1.1.27
Hardcopy Grayscale Image Storage (Retired)	1.2.840.10008.5.1.1.29
Hardcopy Color Image Storage (Retired)	1.2.840.10008.5.1.1.30
CR Image Storage	1.2.840.10008.5.1.4.1.1.1
DX Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
DX Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
MG Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
MG Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
IO Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3
IO Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
US Multi-Frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2
NM Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
MF SC Single Bit Image Storage	1.2.840.10008.5.1.4.1.1.7.1
MF SC Grayscale Byte Image Storage	1.2.840.10008.5.1.4.1.1.7.2
MF SC Grayscale Word Image Storage	1.2.840.10008.5.1.4.1.1.7.3
MF SC True Color Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Stand-alone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8
Stand-alone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9
Waveform Storage (Retried)	1.2.840.10008.5.1.4.1.1.9.1
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1

SOP Class Name	SOP Class UID
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
Stand-alone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10
Stand-alone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1
X-Ray Angio. Bi-plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3
NM Image Storage	1.2.840.10008.5.1.4.1.1.20
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2
Deformable Spatial Registraion Storage	1.2.840.10008.5.1.4.1.1.66.3
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22

SOP Class Name	SOP Class UID
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33
Procedure Log	1.2.840.10008.5.1.4.1.1.88.40
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65
X-Ray Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
PET Image Storage	1.2.840.10008.5.1.4.1.1.128
Stand-alone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9
Hanging Protocol Storage	1.2.840.10008.5.1.4.38.1
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1
XA/XRF Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.5
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1
X-Ray 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1
Autorefraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2

SOP Class Name	SOP Class UID
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4
Visual Acuity Measurements	1.2.840.10008.5.1.4.1.1.78.5
Spectacle Prescription Reports Storage	1.2.840.10008.5.1.4.1.1.78.6
Ophthalmic Axial Measurements Storage	1.2.840.10008.5.1.4.1.1.78.7
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8
Macular Grid Thickness and Volume Report Storage	1.2.840.10008.5.1.4.1.1.79.1
Text SR Storage	1.2.840.10008.5.1.4.1.1.88.1
Audio SR Storage	1.2.840.10008.5.1.4.1.1.88.2
Detail SR Storage	1.2.840.10008.5.1.4.1.1.88.3
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.4
Colon CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.69
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131
RT Beams Delivery Instruction Storage	1.2.840.10008.5.1.4.34.1
Color Palette Storage	1.2.840.10008.5.1.4.39.1
Intravascular Optical Coherence Tomography Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.14.1
Intravascular Optical Coherence Tomography Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.14.2
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1
Implantation Plan SR Storage	1.2.840.10008.5.1.4.1.1.88.70
RT Beams Delivery Instruction Storage	1.2.840.10008.5.1.4.34.7
Generic Implant Template Storage	1.2.840.10008.5.1.4.43.1
Implant Assembly Template Storage	1.2.840.10008.5.1.4.44.1
Implant Template Group Storage	1.2.840.10008.5.1.4.45.1
Philips Private Specialised X-Ray Storage	1.3.46.670589.2.3.1.1
Philips Private CX Image Storage	1.3.46.670589.2.4.1.1
Philips Private 3D Volume Storage (Retired)	1.3.46.670589.5.0.1
Philips Private 3D Volume Storage	1.3.46.670589.5.0.1.1
Philips Private 3D Volume Object Storage (Retired)	1.3.46.670589.5.0.2
Philips Private 3D Volume Object Storage	1.3.46.670589.5.0.2.1
Philips Private Surface Storage (Retired)	1.3.46.670589.5.0.3

SOP Class Name	SOP Class UID
Philips Private Surface Storage	1.3.46.670589.5.0.3.1
Philips Private Composite Object Storage	1.3.46.670589.5.0.4
Philips Private MR Cardio Profile Storage	1.3.46.670589.5.0.7
Philips Private MR Cardio Storage (Retired)	1.3.46.670589.5.0.8
Philips Private MR Cardio Storage	1.3.46.670589.5.0.8.1
Philips Private CT Synthetic Image Storage	1.3.46.670589.5.0.9
Philips Private MR Synthetic Image Storage	1.3.46.670589.5.0.10
Philips Private MR Cardio Analysis Storage (Retired)	1.3.46.670589.5.0.11
Philips Private MR Cardio Analysis Storage	1.3.46.670589.5.0.11.1
Philips Private CX Synthetic Image Storage	1.3.46.670589.5.0.12
Philips Private Perfusion Storage	1.3.46.670589.5.0.13
Philips Private Perfusion Analysis Storage	1.3.46.670589.5.0.14
Philips Private Gyroscan MR Spectrum Storage	1.3.46.670589.11.0.0.12.1
Philips Private Gyroscan MR Series Data Storage	1.3.46.670589.11.0.0.12.2
GE Private Nuclear Medicin Storage	1.2.840.113619.4.27
GE Private Advance (PET) Raw Data Storage	1.2.840.113619.4.30
Siemens Private CSA Non-Image Storage	1.3.12.2.1107.5.9.1

2.2.2 IDS5 - SOP Classes and Transfer syntaxes supported

DICOM Media functionality is described separately in chapter 7 IDS5 DICOM Media AE Specification.

The three following tables (Table 2.2, “Supported SOP classes as SCU (IDS5)”, Table 2.3, “Supported SOP classes as SCP (IDS5)” and Table 2.4, “Supported transfer syntaxes (IDS5)”) use these abbreviations to identify AEs:

Storage SCP SP

Q/R SCU QU

Print SCU PU

Table 2.2 Supported SOP classes as SCU (IDS5)

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)		
		SP	QU	PU
Study Root Q/R Info. Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	-	Y	-
Study Root Q/R Info. Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	-	Y	-
Modality Worklist Info. Model - FIND	1.2.840.10008.5.1.4.31	-	Y	-
Basic Grayscale Print Mgm Meta	1.2.840.10008.5.1.1.9	-	-	Y
> Basic Film Session	1.2.840.10008.5.1.1.1	-	-	Y
> Basic Film Box	1.2.840.10008.5.1.1.2	-	-	Y
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	-	-	Y
> Printer	1.2.840.10008.5.1.1.16	-	-	Y
Presentation LUT	1.2.840.10008.5.1.1.23	-	-	Y

The > signs for the Print Management SOP Classes indicates that the SOP Class is mandatory part of the above mentioned meta SOP Class.

Table 2.3 Supported SOP classes as SCP (IDS5)

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)		
		SP	QU	PU
Verification	1.2.840.10008.1.1	Y	-	-
All Storage SOP Classes, see Table 2.1, "List of supported Storage SOP classes"	See Table 2.1, "List of supported Storage SOP classes"	Y	-	-

Table 2.4 Supported transfer syntaxes (IDS5)

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)		
		SP	QU	PU
Sectra Compression (**Private Syntax**)	1.2.752.24.3.7.6	Y	-	-
Sectra Compression LS (**Private Syntax**)	1.2.752.24.3.7.7	Y	-	-
Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	-	-
Explicit VR Big Endian	1.2.840.10008.1.2.2	Y	-	-
JPEG Lossless, Non-Hier. (Process 14)	1.2.840.10008.1.2.4.57	Y	-	-
JPEG Lossless, Non-Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	Y	-	-
RLE Lossless	1.2.840.10008.1.2.5	Y	-	-
Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y	Y
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	Y	-	-
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	Y	-	-
JPEG Full prog., Non-Hier. (Proc. 10 & 12)	1.2.840.10008.1.2.4.55	Y	-	-

2.2.3 WISE (UNIX) - SOP Classes and Transfer syntaxes supported

The three following tables (Table 2.5, “Supported SOP classes as SCU (WISE (Unix))”, Table 2.6, “Supported SOP classes as SCP (WISE (Unix))” and Table 2.7, “Supported transfer syntaxes (Wise (Unix))”) use these abbreviations to identify AEs:

Storage SCU SU

Storage SCP SP

Q/R SCU QU

Q/R SCP QP

MWL SCP MP

Notif SCU NU

Table 2.5 Supported SOP classes as SCU (WISE (Unix))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)					
		SU	SP	QU	QP	MP	NU
Study Root Q/R Info. Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	-	-	Y	-	-	-
Study Root Q/R Info. Mod. - MOVE	1.2.840.10008.5.1.4.1.2.2.2	-	-	Y	-	-	-
All Storage SOP Classes, see Table 2.1, "List of supported Storage SOP classes" are supported by default. Additional SOP Classes can be configured.	See Table 2.1, "List of supported Storage SOP classes"	Y	-	-	-	-	-
Storage Commitment Push Model	1.2.840.10008.1.20.1	Y*	-	-	-	-	-
Basic Study Content Notification	1.2.840.10008.1.9	-	-	-	-	-	Y
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	-	-	-	Y	-	-

* Only ImageServer/xd

Table 2.6 Supported SOP classes as SCP (WISE (Unix))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)					
		SU	SP	QU	QP	MP	NU
Verification	1.2.840.10008.1.1	-	Y	-	Y	Y	-
All Storage SOP Classes, see Table 2.1, "List of supported Storage SOP classes" are supported by default. Additional SOP Classes can be configured.	See Table 2.1, "List of supported Storage SOP classes"	-	Y	-	-	-	-
Storage Commitment Push Model	1.2.840.10008.1.20.1	-	Y	-	-	-	-
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	-	-	-	Y	-	-
Patient Root Q/R Info. Mod. - FIND	1.2.840.10008.5.1.4.1.2.1.1	-	-	-	Y	-	-
Study Root Q/R Info. Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	-	-	-	Y	-	-
Patient/Study Only Q/R I M - FIND	1.2.840.10008.5.1.4.1.2.3.1	-	-	-	Y	-	-
Patient Root Q/R Info. Mod - MOVE	1.2.840.10008.5.1.4.1.2.1.2	-	-	-	Y	-	-
Study Root Q/R Info. Mod. - MOVE	1.2.840.10008.5.1.4.1.2.2.2	-	-	-	Y	-	-
Patient/Study Only Q/R I M - MOVE	1.2.840.10008.5.1.4.1.2.3.2	-	-	-	Y	-	-
Modality Worklist Info. Mod. - FIND	1.2.840.10008.5.1.4.31	-	-	-	-	Y	-

Table 2.7 Supported transfer syntaxes (Wise (Unix))

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)					
		SU	SP	QU	QP	MP	NU
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	Y	Y	-	-	-	-
Sectra Compression (**Private Syntax**)	1.2.752.24.3.7.6	Y	Y	-	-	-	-
Sectra Compression LS (**Private Syntax**)	1.2.752.24.3.7.7	Y	Y	-	-	-	-
Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y	-	Y	-	-
Explicit VR Big Endian	1.2.840.10008.1.2.2	Y	Y	-	Y	-	-
JPEG Lossless, Non-Hier. (Process 14)	1.2.840.10008.1.2.4.57	Y	Y	-	-	-	-
JPEG Lossless, Non-Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	Y	Y	-	-	-	-
RLE Lossless	1.2.840.10008.1.2.5	Y	Y	-	-	-	-
Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y	Y	Y	Y	Y
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	-	Y	-	-	-	-
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	Y	Y	-	-	-	-
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	Y	Y	-	-	-	-
JPEG Full prog., Non-Hier. (Proc. 10 & 12)	1.2.840.10008.1.2.4.55	Y	Y	-	-	-	-
MPEG2 MP@ML	1.2.840.10008.1.2.4.100	Y	Y	-	-	-	-
MPEG2 MP@HL	1.2.840.10008.1.2.4.101	Y	Y	-	-	-	-
MPEG4 AVC/H.264 HP	1.2.840.10008.1.2.4.102	Y	Y	-	-	-	-
MPEG4 AVC/H.264 BD-compatible HP	1.2.840.10008.1.2.4.103	Y	Y	-	-	-	-

Note: The Verification SOP Class of AEs SP and QP only supports Explicit Little Endian, Explicit Big Endian and Implicit Little Endian Transfer Syntaxes.

Note: The Storage SCU does not support the MPEG2 and MPEG4 transfer syntaxes when invoked from Q/R SCP, i.e. MPEG video objects cannot be retrieved using DICOM Q/R.

2.2.4 Wise (win) - SOP Classes and Transfer syntaxes supported

The three following tables (Table 2.8, “Supported SOP classes as SCU (Wise (win))”, Table 2.9, “Supported SOP classes as SCP (WISE (win))” and Table 2.10, “Supported Transfer Syntaxes (WISE (win))”) use these abbreviations to identify AEs:

Storage SCU SU

Storage SCP SP

Q/R SCU QU

Q/R SCP QP

MWL SCP MP

Notif SCU NU

Table 2.8 Supported SOP classes as SCU (Wise (win))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)					
		SU	SP	QU	QP	MP	NU
Study Root Q/R Info. Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	-	-	Y	-	-	-
Study Root Q/R Info. Mod. - MOVE	1.2.840.10008.5.1.4.1.2.2.2	-	-	Y	-	-	-
All Storage SOP Classes, see Table 2.1, "List of supported Storage SOP classes" are supported by default. Additional SOP Classes can be configured.	See Table 2.1, "List of supported Storage SOP classes"	Y	-	-	-	-	-
Storage Commitment Push Model	1.2.840.10008.1.20.1	Y*	-	-	-	-	-
Basic Study Content Notification	1.2.840.10008.1.9	-	-	-	-	-	Y

* Only ImageServer/xd

Table 2.9 Supported SOP classes as SCP (WISE (win))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)					
		SU	SP	QU	QP	MP	NU
Verification	1.2.840.10008.1.1	-	Y	-	Y	Y	-
All Storage SOP Classes, see Table 2.1, "List of supported Storage SOP classes" are supported by default. Additional SOP Classes can be configured.	See Table 2.1, "List of supported Storage SOP classes"	-	Y	-	-	-	-
Storage Commitment Push Model*	1.2.840.10008.1.20.1	-	Y	-	-	-	-
Patient Root Q/R Info. Mod. - FIND	1.2.840.10008.5.1.4.1.2.1.1	-	-	-	Y	-	-
Study Root Q/R Info. Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	-	-	-	Y	-	-
Patient/Study Only Q/R I M - FIND	1.2.840.10008.5.1.4.1.2.3.1	-	-	-	Y	-	-
Patient Root Q/R Info. Mod - MOVE	1.2.840.10008.5.1.4.1.2.1.2	-	-	-	Y	-	-
Study Root Q/R Info. Mod. - MOVE	1.2.840.10008.5.1.4.1.2.2.2	-	-	-	Y	-	-
Patient/Study Only Q/R I M - MOVE	1.2.840.10008.5.1.4.1.2.3.2	-	-	-	Y	-	-
Modality Worklist Info. Mod. - FIND	1.2.840.10008.5.1.4.31	-	-	-	-	Y	-

*Only Implicit VR Little Endian Transfer Syntax is supported

Table 2.10 Supported Transfer Syntaxes (WISE (win))

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)					
		SU	SP	QU	QP	MP	NU
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	Y	Y	-	-	-	-
Sectra Compression (**Private Syntax**)	1.2.752.24.3.7.6	Y	Y	-	-	-	-
Sectra Compression LS (**Private Syntax**)	1.2.752.24.3.7.7	Y	Y	-	-	-	-
Explicit VR Little Endian	1.2.840.10008.1.2.1	Y	Y	-	-	-	-
Explicit VR Big Endian	1.2.840.10008.1.2.2	Y	Y	-	-	-	-
JPEG Lossless, Non-Hier. (Process 14)	1.2.840.10008.1.2.4.57	Y	Y	-	-	-	-
JPEG Lossless, Non-Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	Y	Y	-	-	-	-
RLE Lossless	1.2.840.10008.1.2.5	Y	Y	-	-	-	-
Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y	Y	Y	Y	Y
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	-	Y	-	-	-	-
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	Y	Y	-	-	-	-
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	Y	Y	-	-	-	-
JPEG Full prog., Non-Hier. (Proc. 10 & 12)	1.2.840.10008.1.2.4.55	Y	Y	-	-	-	-
MPEG2 MP@ML	1.2.840.10008.1.2.4.100	Y	Y	-	-	-	-
MPEG2 MP@HL	1.2.840.10008.1.2.4.101	Y	Y	-	-	-	-
MPEG4 AVC/H.264 HP	1.2.840.10008.1.2.4.102	Y	Y	-	-	-	-
MPEG4 AVC/H.264 BD-compatible HP	1.2.840.10008.1.2.4.103	Y	Y	-	-	-	-

Note: The Storage Commitment Push Model SOP Class is only supported with Implicit VR Little Endian Transfer Syntax for WISE (win).

2.2.5 SHS - SOP Classes and Transfer syntaxes supported

DICOM Media functionality is described separately in chapter 8 IDS7 DICOM Media AE Specification.

The two following tables (Table 2.11, "Supported SOP classes as SCU (SHS)" and Table 2.12, "Supported transfer syntaxes (SHS)") use these abbreviations to identify AEs:

Q/R SCU QU

Print SCU PU

Table 2.11 Supported SOP classes as SCU (SHS)

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)	
		QU	PU
Study Root Q/R Info. Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Y	-
Study Root Q/R Info. Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Y	-
Basic Grayscale Print Mgm Meta	1.2.840.10008.5.1.1.9	-	Y
> Basic Film Session	1.2.840.10008.5.1.1.1	-	Y
> Basic Film Box	1.2.840.10008.5.1.1.2	-	Y
> Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	-	Y
Presentation LUT	1.2.840.10008.5.1.1.23	-	Y

Table 2.12 Supported transfer syntaxes (SHS)

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)	
		QU	PU
Sectra Compression (**Private Syntax**)	1.2.752.24.3.7.6	-	-
Sectra Compression LS (**Private Syntax**)	1.2.752.24.3.7.7	-	-
Explicit VR Little Endian	1.2.840.10008.1.2.1	-	-
Explicit VR Big Endian	1.2.840.10008.1.2.2	-	-
JPEG Lossless, Non-Hier. (Process 14)	1.2.840.10008.1.2.4.57	-	-
JPEG Lossless, Non-Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	-	-
RLE Lossless	1.2.840.10008.1.2.5	-	-
Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y
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 Full prog., Non-Hier. (Proc. 10 & 12)	1.2.840.10008.1.2.4.55	-	-

2.2.6 IDS5 - AE descriptions

DICOM Media functionality is described separately in chapter 7 IDS5 DICOM Media AE Specification.

2.2.6.1 Storage SCP

Storage SCP is the AE responsible for receiving images. The IDS5 Storage SCP is used **only** for receiving Q/R images fetched from a Q/R SCP. It will only store the images temporary and should not be used for long-term storage.

Each time the IDS5 is exited, all stored images are removed.

Read more about this functionality in User's Guide IDS5 [4].

2.2.6.2 Q/R-MWL SCU

Q/R-MWL handles queries and retrieve requests from an IDS5 user. User can define search criteria and request information from several Q/R SCPs and/or MWL SCPs at the same time.

When responses are received from a Q/R SCP the user can select examinations and import them to the WISE Storage SCP or choose to fetch them temporarily to the IDS5 Storage SCP and view them locally.

Read more about this functionality in IDS5 Storage SCP above and in User's Guide IDS5 [4].

2.2.6.3 Print SCU

Print SCU is the AE responsible for sending print request to DICOM printers. It is connected to the IDS5 product. There is only one Print SCU AE per IDS5.

As described in theUser's Guide IDS5 [4] the IDS5 workstation user chooses images to print from the matrix or image windows. When the user has collected the images to print, he or she issues the print command. This will open the print preview. From the preview the user can do some further arrangement for the print, choose the printer to print to and send the images to this printer. When this happens the Print SCU AE is activated, acts as a SCU and initiates an association with the remote AE, supporting DICOM Print Management as SCP (a DICOM printer).

2.2.7 WISE (Unix/win) - AE descriptions

2.2.7.1 Storage SCU

Storage SCU is the AE responsible for sending images to remote applications. There is only one Storage SCU AE. Sending is initiated in the following situations:

- by a retrieve operation from Q/R SCP,
- from an IDS5 or an IDS7, or
- as a result of archiving command when using ImageServer/xd

The second situation is described in the User's Guide IDS5 [4] and User's Guide IDS7 [5]. When the IDS5/IDS7 workstation user selects examinations to send from the information window, he or she issues the send command by selecting the desired destination. The command is forwarded to WISE, which will activate the Storage SCU AE indicating the examinations and destination that the user has chosen. The Storage SCU AE will then initiate an association with the remote AE, supporting DICOM Storage as SCP.

2.2.7.2 Storage SCP

Storage SCP is the AE responsible for receiving images. There can be any number of Storage SCP AEs set up, each with its own AE title.

A Storage SCP AE can receive images from a remote application entity. A Storage SCP AE also supports verification of the DICOM communication from a remote AE and Storage Commitment of images.

2.2.7.3 Q/R SCU

Q/R SCU is used only when the ImageServer/xd (interface to external DICOM archive) product is used in the PACS. It is invoked when archive retrieval is performed. It will search and retrieve requested studies from the external DICOM archive. There is only one Q/R SCU AE.

2.2.7.4 Q/R SCP

Q/R SCP is the AE responsible for receiving queries and sending images to other application entities as a response to a move request. The Q/R SCP AE is connected to the WISE product. There can be one or more Q/R SCP AEs, each with its own AE title.

When the Q/R SCP AE receives a query (C-FIND request) it will search in the WISE database for information matching the conditions in the request message. It will search both on-line and in the archive. It returns any found information to the requesting remote AE.

When the Q/R SCP AE receives a retrieve request (C-MOVE request) it will search for images in the WISE database identified by the conditions in the request message. It will search both on-line and in the archive. If any images are found the Q/R SCP AE will change into a Storage SCU and send the images found to the requested destination AE. If the retrieve request refers to images in the archive the images will be fetched from the archive and temporarily put on-line. When the retrieve is done, the temporary images on-line will be removed. Only C-MOVE requests are handled in order to supply retrieve functionality, not C-GET requests.

The Q/R SCP AE supports verification of the DICOM communication from a remote AE.

The Q/R SCP AE on WISE (UNIX) also supports handling of Modality Performed Procedure Steps through the N-SET and N-CREATE commands. The received messages can be relayed to other Modality Performed Procedure Step SCUs. Modality Performed Procedure Step is currently not supported on WISE (win).

2.2.7.5 MWL SCP

MWL SCP is the AE responsible for handling requests for worklists from external devices. The MWL SCP AE is connected to the WISE product. There can be one or more MWL SCP AEs, each with its own AE title.

When the MWL SCP AE receives a query (C-FIND request) it will search in the WISE database for information matching the conditions in the request message. It returns any found information to the requesting remote AE.

The MWL SCP AE supports verification of the DICOM communication from a remote AE.

2.2.7.6 Notif SCU

If WISE is configured so, the Notif SCU sends a Basic Study Descriptor instance for a specific Study when the corresponding exam is approved. The Basic Study Descriptor object is typically sent to a RIS to indicate that an exam is made, and to indicate the number of images in the exam.

The Notif SCU can also be configured to send a Basic Study Descriptor instance on these events:

- An exam is retrieved from the archive.
- The last on-line copy of an exam is deleted.

2.2.8 SHS - AE descriptions

DICOM Media functionality is described separately in chapter 8 IDS7 DICOM Media AE Specification.

2.2.8.1 Q/R SCU

Q/R handles queries and retrieve requests from an IDS7 user. User can define search criteria and request information from several Q/R SCPs at the same time.

When responses are received from a Q/R SCP the user can select examinations and import them to the WISE Storage SCP.

2.2.8.2 Print SCU

Print SCU is the AE responsible for sending print request to DICOM printers. It is connected to the SHS product. There is only one Print SCU AE per SHS.

As described in theUser's Guide IDS7 [16] the IDS7 workstation user chooses images to print from the matrix or image windows. When the user has collected the images to print, he or she issues the print command. This will open the print dialog where the user can choose the printer to print to and send the images to this printer. When this happens the Print SCU AE is activated, acts as a SCU and initiates an association with the remote AE, supporting DICOM Print Management as SCP (a DICOM printer).

2.3 Sequencing of Real-World Activities

2.3.1 IDS5

IDS5 will perform operations (Print, Send, Approve) on images found in WISE. It can also query DICOM archives and receive images locally for temporary viewing.

2.3.2 IDS7 and SHS

IDS7/SHS will perform operations (Print, Send, Approve) on images found in SHS/WISE. It can also query DICOM archives.

2.3.3 WISE (Unix/win)

WISE receives images and then it can be queried through both Q/R and WISE API. Sending images, storage commitment and notification can be performed on images stored.

3 IDS5 AE Specifications

The following topics are included in this chapter:

3.1 Storage SCP AE Specifications (IDS5)

3.1.1 Association Establishment Policies

3.1.1.1 General

The maximum PDU-length, which a Storage SCP AE will handle, is configurable. The default is 28672 bytes (28 Kbytes). Configuration can only be done by Sectra authorized personnel. Allowed values are between 4096 bytes (4kB) and 131072 bytes (128 Kbytes) including these values.

3.1.1.2 Number of Associations

Each Storage SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

3.1.1.3 Asynchronous Nature

A Storage SCP AE will only allow a single outstanding operation on an association. Therefore, a Storage SCP AE will not perform asynchronous operations window negotiation.

3.1.1.4 Implementation Identifying Information

A Storage SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name. This is the default value.	WISTOSCP_11_40
Implementation version name. This version name is used if the SCP is configured with option -F.	WISSTOSCP_11_40

3.1.2 Association Initiation Policy

The IDS5 Storage SCP will not initiate associations.

3.1.3 Association Acceptance Policy

A Storage SCP AE **rejects** associations in the following situations:

- Association requests from applications that do not address it, i.e. specify an incorrect called AE title.
- Association requests from hosts with host names not known to the Storage SCP AE host.
- For image transfers if it is already processing the maximum number of associations that it can handle (default: 5).
- For image transfers and if configured so, if the WISE server is not responding.

A Storage SCP AE **accepts** associations for the following events:

- Verification of the DICOM communication between a remote system and a Storage SCP AE.
- Transfer of images from a remote system to the WISE database.

3.1.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with a Storage SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.3, “Supported SOP classes as SCP (IDS5)” and Table 2.4, “Supported transfer syntaxes (IDS5)”. Role is SCP.

SOP Specific Conformance

A Storage SCP AE provides standard conformance to the DICOM Verification Service Class.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.4, “Supported transfer syntaxes (IDS5)”.

3.1.3.2 Transfer of Images from a Remote System to the local storage

Associated Real-World Activity

A remote system wants to store images temporary on IDS5 workstation.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 2.3, “Supported SOP classes as SCP (IDS5)” and Table 2.4, “Supported transfer syntaxes (IDS5)”. Role is SCP.

SOP Specific Conformance

When images arrive to Storage SCP, they are sorted into temporary directories from their source AE title, Study Instance UID and Series Instance UID. Images with same Series Instance UID will be interpreted as a stack and shown as one in IDS5. Receiving the same image twice will not overwrite the first one; instead a duplicate image will be created. Only information available in images and their preceding queries will be shown and used.

Regarding viewing capabilities of IDS5 the following points must be noted

- Multi-frame images in one dimension can be viewed in IDS5; multi-dimensional on the other hand cannot be viewed correctly. They will behave as a one-dimensional image; showing them will do so with images in a random order.
- IDS5 shows images with non-square pixels as if the pixels where square. It is possible to configure image import so that non-square pixels are transformed to square pixels.

Regarding color images, IDS5 can only display those with Photometric interpretation, (0028, 0004), equal to

- RGB with 24 bits (8 bits per channel)
- PALETTE_COLOR
- YBR_FULL_422 (jpeg-compressed)
- YBR_FULL

Images are handled color-by-pixel internally in WISE and IDS5. Under certain circumstances images that are sent color-by-plane to WISE/IDS5 can be sent color-by-pixel if fetched from IDS5/WISE.

The first LUT in a Modality LUT Sequence, attribute (0028, 3000), is handled. The rest (second, third and so on) are ignored.

IDS5 has full support of DICOM Overlays, however if multiple overlays are present in an image you can only choose between showing no DICOM overlays or all DICOM overlays.

Regarding color images, IDS7 can only display those with Photometric interpretation, (0028, 0004), equal to

- RGB with 24 bits (8 bits per channel)
- PALETTE_COLOR
- YBR_FULL_422 (jpeg-compressed)
- YBR_FULL

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.4, “Supported transfer syntaxes (IDS5)”.

3.2 Q/R-MWL SCU AE Specification

3.2.1 Association Establishment Policies

3.2.1.1 General

The maximum PDU size that the Q/R-MWL SCU AE will handle is 16384 bytes (16kB).

3.2.1.2 Number of Associations

The Q/R-MWL SCU AE can only handle one association at a time. One Q/R-MWL request is finished before the next is started.

3.2.1.3 Asynchronous Nature

The Q/R-MWL SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

3.2.1.4 Implementation Identifying Information

The Q/R-MWL SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WIQRSCU_11_40

3.2.2 Association Initiation Policy

3.2.2.1 Real-World Activity - Q/R Find

Associated Real-World Activity

A user creates a search or a worklist containing one or several Q/R SCPs. Then the user defines the search criteria to be used and the search or worklist search is performed. When several Q/R SCPs are defined for a search or worklist they are queried in sequence.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.2, “Supported SOP classes as SCU (IDS5)” and Table 2.4, “Supported transfer syntaxes (IDS5)”. Role is SCU.

SOP-Specific Conformance

The Q/R-MWL SCU provides standard conformance to the Q/R service class.

See table below in section on Real-World Activity - MWL Find for attributes used in Q/R C-FIND requests.

3.2.2.2 Real-World Activity - MWL Find

Associated Real-World Activity

A user creates a search or a worklist containing one or several MWL SCPs. Then the user defines the search criteria to be used and the search or worklist search is performed. When several MWL SCPs are defined for a search or worklist they are queried in sequence.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.2, "Supported SOP classes as SCU (IDS5)" and Table 2.4, "Supported transfer syntaxes (IDS5)". Role is SCU.

SOP-Specific Conformance

The Q/R-MWL SCU provides standard conformance to the Q/R service class.

The following attributes can be used by the Q/R-MWL SCU in Q/R and MWL C-FIND requests.

Attribute Name	Tag	Used for matching	Required in response	Remarks
Scheduled Procedure Step Sequence	(0040,0100)			
>Scheduled Station AE Title	(0040,0001)	Yes	Yes	
>Modality	(0008,0060)	Yes	Yes	
>Scheduled Station Name	(0040,0010)	Yes	Yes	
>Scheduled Procedure Step Start Date	(0040,0002)	Yes	Yes	
>Scheduled Procedure Step Start Time	(0040,0003)	Yes	Yes	
Patient ID	(0010,0020)	Yes	Yes	
Patient's Name	(0010,0010)	Yes	Yes	
Patient's Birth Date	(0010,0030)	No	Yes	
Patient's Sex	(0010,0040)	No	Yes	
Study Instance UID	(0020,000D)	No	Yes	
Study ID	(0020,0010)	Yes	Yes	
Accession Number	(0008,0050)	No	Yes	
Study Description	(0008,1030)	No	Yes	

3.2.2.3 Real-World Activity - Import

Associated Real-World Activity

When responses are received from a search, as described in section above, the user can select one or several of the matching studies to fetch them from the Q/R SCP. The images are sent to a configured destination, usually a Storage SCP AE on the WISE.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.2, "Supported SOP classes as SCU (IDS5)" and Table 2.4, "Supported transfer syntaxes (IDS5)". Role is SCU.

SOP-Specific Conformance

The Q/R-MWL SCU provides standard conformance to the Q/R service class.

3.2.2.4 Real-World Activity - Fetch

Associated Real-World Activity

When responses are received from a search, as described in section above, the user can select one or several of the matching studies to fetch them from the Q/R SCP. The images are sent to IDS5 workstation for temporary storage.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.2, "Supported SOP classes as SCU (IDS5)" and Table 2.4, "Supported transfer syntaxes (IDS5)". Role is SCU.

SOP-Specific Conformance

The Q/R-MWL SCU provides standard conformance to the Q/R service class.

3.2.3 Association Acceptance Policy

The Q/R-MWL SCU AE does not handle incoming associations.

3.3 Print SCU AE Specification

3.3.1 Association Establishment Policies

3.3.1.1 General

The maximum PDU size that the Print SCU AE will handle is 16 Kbytes.

3.3.1.2 Number of Associations

The Print SCU AE can only handle one association at a time. One print request has to be finished before the next can be started.

3.3.1.3 Asynchronous Nature

The Print SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

3.3.1.4 Implementation Identifying Information

The Print SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WIPRISCU_11_40

3.3.2 Association Initiation Policy

3.3.2.1 Real-World Activity - Print Command

Associated Real-World Activity

As described in User's Guide IDS5 [4] the IDS5 workstation user chooses images to print from the matrix or image windows. When the user has collected the images to print, he or she issues the print command. This will open the print preview. From the preview the user can do some further arrangement for the print, choose the printer to print to and send the images to this printer. When this happens the Print SCU AE is activated, acts as an SCU and initiates an association with a remote AE, hopefully supporting DICOM Print Management as SCP (a DICOM printer).

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.2, "Supported SOP classes as SCU (IDS5)" and Table 2.4, "Supported transfer syntaxes (IDS5)". Role is SCU.

SOP-Specific Conformance

The Print SCU AE supports the mandatory SOP classes, which are defined under the Basic Grayscale Print Management Meta SOP Class, see Table 2.2, "Supported SOP classes as SCU (IDS5)". No optional SOP classes are supported.

The Print SCU AE uses the following DIMSE Service Elements:

Table 3.1 DIMSE Service Elements

SOP Class	DIMSE Service Element
Basic Film Session SOP Class	N-CREATE, N-DELETE
Basic Film Box SOP Class	N-CREATE, N-DELETE, N-ACTION
Basic Grayscale Image Box SOP Class	N-SET
Printer SOP Class	N-GET
Presentation LUT SOP Class	N-CREATE

N-EVENT-REPORT is not supported.

Immediately after establishing an association, the Print SCU AE will execute an N-GET on the Printer SOP Class. This operation can be configured into two modes, one for fetching all available printer attributes and one for fetching a minimal set of printer attributes.

If configured to fetch all attributes, the following attributes will be requested:

Table 3.2 Attributes, when fetching all available attributes

Attribute name	Tag	Optionalaccording to standard
Printer Status	(2110,0010)	NO
Printer Status Info	(2110,0020)	NO
Printer Name	(2110,0030)	YES
Manufacturer	(0008,0070)	YES
Manufacturer Model Name	(0008,1090)	YES
Device Serial Number	(0018,1000)	YES
Software Versions	(0018,1020)	YES
Date Of Last Calibration	(0018,1200)	YES
Time Of Last Calibration	(0018,1201)	YES

If configured to fetch a minimum set of attributes, the following attributes will be requested:

Table 3.3 Attributes, when fetching minimum set of attributes

Attribute name	Tag	Optionalaccording to standard
Printer Status	(2110,0010)	NO
Printer Status Info	(2110,0020)	NO
Printer Name	(2110,0030)	YES

If the Printer Status tag is returned as NORMAL, the print job will continue immediately.

If the status is WARNING, the user will be notified and the value of the Printer Status Info tag will be displayed. The print job is then continued.

If the status is FAILURE, the user will be notified and the value of the Printer Status Info tag will be displayed. The print job is then aborted.

The Print SCU AE supports the following SOP class attributes:

Table 3.4 SOP Class Attributes

SOP Class, DIMSE Service Element	Attribute name	Tag	Optional according to standard	Config-urable	Default value
Basic Film Session N-CREATE	Number of Copies	(2000,0010)	YES	YES	1
Basic Film Session N-CREATE	Print Priority	(2000,0020)	YES	YES	MED
Basic Film Session N-CREATE	Medium Type	(2000,0030)	YES	YES	BLUE FILM
Basic Film Session N-CREATE	Film Destination	(2000,0040)	YES	YES	MAGAZINE
Basic Film Box N-CREATE	Image Display Format	(2010,0010)	NO	NO	STANDARD\1,1
Basic Film Box N-CREATE	Film Orientation	(2010,0040)	YES	YES	PORTRAIT
Basic Film Box N-CREATE	Film Size ID	(2010,0050)	YES	YES	14INX17IN
Basic Film Box N-CREATE	Magnification Type	(2010,0060)	YES	YES	(none)
Basic Film Box N-CREATE	Max Density	(2010,0130)	YES	YES	(none)
Basic Film Box N-CREATE	Configuration Information	(2010,0150)	YES	YES	(none)
Basic Film Box N-CREATE	Smoothing Type	(2010,0080)	YES	YES	(none)
Basic Film Box N-CREATE	Border Density	(2010,0100)	YES	YES	BLACK
Basic Film Box N-CREATE	Empty Image Density	(2010,0110)	YES	YES	BLACK
Basic Film Box N-CREATE	Min Density	(2010,0120)	YES	YES	(none)
Basic Film Box N-CREATE	Trim	(2010,0140)	YES	YES	YES
Basic Film Box N-CREATE	Illumination	(2010,015E)	YES	YES	(none)
Basic Film Box N-CREATE	Reflected Ambient Light	(2010,0160)	YES	YES	(none)
Basic Film Box N-CREATE	Referenced Presentation LUT Sequence	(2050,0500)	YES	YES	(none)
Basic Film Box N-CREATE	>Referenced SOP Class UID	(0008,1150)	YES	YES	(none)

SOP Class, DIMSE Service Element	Attribute name	Tag	Optional according to standard	Config-urable	Default value
Basic Film Box N-CREATE	>Referenced SOP Instance UID	(0008,1155)	YES	YES	(none)
Basic Grayscale Image Box N-SET	Polarity	(2020,0020)	YES	YES	NORMAL

Several images per film can be printed. They are arranged in IDS5, which composes them and sends them as one big image (Image Display Format “STANDARD\1,1”).

3.3.3 Association Acceptance Policy

The Print SCU AE does not handle incoming associations.

4 WISE (UNIX) AE Specifications

The following topics are included in this chapter:

4.1 Storage SCU AE Specification (WISE (UNIX))

4.1.1 Association Establishment Policies

4.1.1.1 General

The maximum PDU size that the Storage SCU AE will handle is 28672 bytes (28 Kbytes).

4.1.1.2 Number of Associations

The Storage SCU AE can only handle one association at a time. One send request has to be finished before the next is started.

4.1.1.3 Asynchronous Nature

The Storage SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.1.1.4 Implementation Identifying Information

The Storage SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	SISTOSCU_15_20

4.1.2 Association Initiation Policy

4.1.2.1 Real-World Activity - Send Command

Associated Real-World Activity

As described in User's Guide IDS5 [4] the IDS5 workstation user selects examinations to send from the information window. Then he or she issues the send command by selecting the desired destination. The command is forwarded to WISE, which will activate the Storage SCU AE indicating the examinations, and destination that the user has chosen. The Storage SCU AE will then initiate an association with the remote AE, hopefully supporting DICOM Storage as SCP.

Image Sending can also be activated as a result of a C-MOVE request towards the Q/R SCP or when archiving images using ImageServer/xd.

Proposed Presentation Contexts

Possible proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 2.5, "Supported SOP classes as SCU (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCU.

SOP-Specific Conformance

The Storage SCU provides standard conformance to the SOP Classes of the Storage Service Class.

If patient or exam data for exported images has been changed in WISE, the exported images will contain the values from WISE.

If settings and annotations have been made in the default setting for images in IDS5, this information will be exported as Standard Grayscale Presentation State if the receiving side supports such (see appendix D Exported Presentation States for details), otherwise the annotations will be exported as standard DICOM overlays incorporated into the images (i.e. no stand-alone DICOM overlays will be used).

If the IDS5 user changes an existing default setting of an image the SOP Instance UID of the associated presentation state will be changed. The old setting will not be saved.

If configured so, the Storage SCU AE will export Sectra private attributes. These are documented in appendix C Sectra Private Attributes.

4.1.2.2 Read-World Activity - Storage Commit

Associated Real-World Activity

Storage Commitment will be used when images are archived using ImageServer/xd and the remote DICOM archive supports Storage Commitment as SCP.

Proposed Presentation Contexts

Possible proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 2.5, "Supported SOP classes as SCU (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCU.

SOP Specific Conformance

The Storage SCU will send the N-ACTION-RQ message and wait for the N-ACTION-RSP. The association will then be closed. A Storage SCP of the same PACS will accept and handle the associated N-EVENT-REPORT-RQ with the same Transaction UID.

4.1.3 Association Acceptance Policy

The Storage SCU AE does not handle incoming associations.

4.2 Storage SCP AE Specification (WISE (UNIX))

4.2.1 Association Establishment Policies

4.2.1.1 General

The maximum PDU-length, which a Storage SCP AE will handle, is configurable. The default is 28672 bytes (28 Kbytes). Configuration can only be done by Sectra authorized personnel.

4.2.1.2 Number of Associations

Each Storage SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

Any number of Storage SCP AEs can be set up, meaning that a great number of C-STORE associations can be handled at the same time. Typically one Storage SCP AE per sending application is set up.

4.2.1.3 Asynchronous Nature

A Storage SCP AE will only allow a single outstanding operation on an association. Therefore, a Storage SCP AE will not perform asynchronous operations window negotiation.

4.2.1.4 Implementation Identifying Information

A Storage SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name. This is the default value.	UXSTOSCP_15_20
Implementation version name. This version name is used if the SCP is configured with option -F.	UXSSTOSCP_15_20

4.2.2 Association Initiation Policy

The only situation in which a Storage SCP AE will initiate associations with a remote AE is in case a remote application has sent a Storage Commitment N-ACTION and the Storage SCP is configured to always send the N-EVENT-REPORT on a new association or if the SCU has shut down the association instead of waiting for the N-EVENT-REPORT response. This is described in a section below.

4.2.3 Association Acceptance Policy

A Storage SCP AE **rejects** associations in the following situations:

- Association requests from applications that do not address it, i.e. specify an incorrect called AE title.
- Association requests from hosts with host names not known to the Storage SCP AE host.
- For image transfers if it is already processing the maximum number of associations that it can handle (default: 5).
- For image transfers and if configured so, if the WISE server is not responding.

A Storage SCP AE **accepts** associations for the following events:

- Verification of the DICOM communication between a remote system and a Storage SCP AE.
- Transfer of images from a remote system to the WISE database.
- Request for Storage Commitment to store images in WISE.

4.2.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with a Storage SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

A Storage SCP AE provides standard conformance to the DICOM Verification Service Class.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, "Supported transfer syntaxes (Wise (Unix))".

4.2.3.2 Transfer of Images from a Remote System to the WISE database

Associated Real-World Activity

A remote system wants to store images in the WISE database.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

A Storage SCP AE provides standard level 2 (full) conformance to the DICOM Storage Service Class as SCP. Full conformance means that all type 1, 2 and 3 attributes sent are stored. All private and retired attributes are also stored. However, the `stackstore` implementation will discard any element that is received with an explicitly encoded value representation that is different from the standard value representation for that element.

A Storage SCP AE needs a value of the attribute (0010,0020), Patient ID. If the attribute is empty it will use the attribute (0010,0010), Patient Name, as patient ID. If the patient name is empty as well it will use the request number (see System Administrators's Guide ImageServer/s HP-UX [9]) as patient ID. Applications sending images to a Storage SCP AE must take care when filling in the Patient ID attribute. If it is not filled in, there is a risk that images of different patients can be mixed!

If the image storage should fail on the WISE side, a status of refused, “Out of resources”, will be returned to the association initiator.

WISE can be configured to overwrite images with same SOP Instance UID or to store all images it receives. Default is the second alternative, i.e. not to overwrite images with same SOP Instance UID. This means that if the same image is sent twice to a Storage SCP AE it will be stored two times in WISE. This implicates that two images with the same SOP Instance UID will be sent if a MOVE request is received by the Q/R SCP AE on that image.

For more detailed information about the handling of specific attributes by WISE and IDS5, see appendix A Attribute List for Storage SCP.

If DICOM attributes are illegal, no responsibilities for consequences are taken. The following consequence has been noted:

- If (0020,0011) Series Number is outside the allowed range, $-(2^{32}-1)$ x $(2^{32}-1)$, WISE will truncate all bits above the 32^{nd} position.

Regarding viewing capabilities of IDS5 the following points must be noted

- Multi-frame images in one dimension can be viewed in IDS5; multi dimensional on the other hand cannot be viewed correctly. They will behave as a one-dimensional image; showing them will do so with images in a random order.
- IDS5 shows images with non-square pixels as if the pixels where square. It is possible to configure image import in WISE so that non-square pixels are transformed to square pixels.

Regarding color images, IDS5 can only view those with (0028,0004), Photometric interpretation, equal to

- RGB with 24 bits (8 bits per channel)
- PALETTE_COLOR
- YBR_FULL_422
- YBR_FULL

Images are handled color-by-pixel internally in WISE and IDS5. In certain circumstances image that are sent color-by-plane to WISE/IDS5 are sent color-by-pixel if fetched from IDS5/WISE.

The first LUT in a Modality LUT sequence, attribute (0028,3000), is handled. The rest (second, third and so on) are ignored.

IDS5 has full support of DICOM Overlays, however if multiple overlays are present in an image you can only choose between showing no DICOM overlays or all DICOM overlays.

Regarding color images, IDS7 can only view those with (0028,0004), Photometric interpretation, equal to

- RGB
- PALETTE_COLOR
- YBR_FULL_422 (jpeg-compressed)
- YBR_FULL

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, "Supported transfer syntaxes (Wise (Unix))".

4.2.3.3 Request to Commit to Store Images in the WISE Database

Associated Real-World Activity

A remote system makes a request for WISE to commit to store a number of images.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

The Storage SCP AE provides standard conformance to the Storage Commitment Push Model SOP Class.

Notes about the implementation:

If configured so, the N-EVENT-REPORT-RQ message will be sent in a separate association to a configurable AE (as recommended by IHE).

If not, an attempt will be made to transmit the N-EVENT-REPORT-RQ message on the same association as the N-ACTION-RQ message was received. If the association is down, the Storage SCP AE will open a new association to the Storage Commitment SCU and Verification of the DICOM communication between a remote system and the Q/R SCP AEsend the N-EVENT-REPORT-RQ message on the new association. The time between the reception of the N-ACTION-RQ message and the sending of the N-EVENT-REPORT-RQ message is dependent on the WISE server load, but it can be expected to be short (seconds).

Any time after the images have been committed with Storage Commitment, they can be deleted by an IDS5 user, i.e. a Storage Commitment will not make sure that the images will be stored permanently.

Committed images can be retrieved using DICOM Query/Retrieve towards a Q/R SCP AE connected to the same WISE server. If a Q/R SCP is connected towards the WISE server at time of commitment, the AE title of it will be returned in the N-EVENT-REPORT message sent to the SCU.

Storage Commitment can be made for images stored on short-term (RAID) or long-term storage (Archive).

The optional Storage Media File-Set ID & UID attributes will never be filled in by the Storage SCP AE.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, “Supported transfer syntaxes (Wise (Unix))”.

4.3 Q/R SCU AE Specification (WISE (UNIX))

4.3.1 Association Establishment Policies

4.3.1.1 General

The maximum PDU size that the Q/R SCU AE will handle is 28672 bytes (28 Kbytes).

4.3.1.2 Number of Associations

The Q/R SCU AE can only handle one association at a time.

4.3.1.3 Asynchronous Nature

The Q/R SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.3.1.4 Implementation Identifying Information

The Q/R SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WIQRSCU_15_20

4.3.2 Association Initiation Policy

4.3.2.1 Real-World Activity - Fetch from DICOM archive Command

Associated Real-World Activity

This command is invoked when an archive retrieval from an external DICOM archive is preformed. It will search and retrieve requested studies from the external DICOM archive.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.5, "Supported SOP classes as SCU (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCU.

SOP-Specific Conformance

The Q/R SCU provides standard conformance to used SOP Classes in the Q/R Service Class.

4.3.3 Association Acceptance Policy

The Q/R SCU AE does not handle incoming associations.

4.4 Q/R SCP AE Specification (WISE (UNIX))

4.4.1 Association Establishment Policies

4.4.1.1 General

The maximum PDU length that the Q/R SCP AE will handle is configurable. Default is 28672 bytes (28 Kbytes). Only Sectra authorized personnel can change this configuration.

4.4.1.2 Number of Associations

The Q/R SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

4.4.1.3 Asynchronous Nature

The Q/R SCP AE will only allow a single outstanding operation on an association. Therefore, the Q/R SCP AE will not perform asynchronous operations window negotiation.

4.4.1.4 Implementation Identifying Information

The Q/R SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	UXQRSCP_15_20

4.4.2 Association Initiation Policy

The Q/R SCP AE will not initiate any associations. When a retrieve request is forwarded to the Q/R SCP, the images will be copied using the Storage SCU AE.

4.4.3 Association Acceptance Policy

The Q/R SCP AE will reject associations from applications that do not address it, i.e. specify an incorrect called AE title. The Q/R SCP AE will also reject associations with `C-MOVE` requests from hosts not present in the `/etc/hosts` file.

The Q/R SCP AE accepts associations for the following events:

- Verification of the DICOM communication between a remote system and the Q/R SCP AE
- Query of the WISE database
- Retrieve images from the WISE database
- Information about Modality Performed Procedure steps

4.4.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with the Q/R SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the DICOM Verification Service Class.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, "Supported transfer syntaxes (Wise (Unix))".

4.4.3.2 Query of the WISE Database

Associated Real-World Activity

A remote system wants to query the WISE database using the `C-FIND` command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP. Extended negotiation is supported.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the FIND SOP classes of the Q/R service class as SCP with the following exceptions:

- Fractions of seconds are ignored.
- At most 100 matches are returned. The hit limit can be configured. If there are more items than the hit limit in the WISE database, zero matches are returned.

appendix B Key List for Q/R C-FIND-RQ lists all attributes that are supported as matching and return keys.

Relational queries are supported.

Case insensitive matching is used for patient name. For all other attributes, case sensitive matching is used.

Range matching is supported for both Study Date and Study Time. If both Study Date and Study Time are specified as a range, e.g. date1 - date2 and time1 - time2, all studies between date1.time1 and date2.time2 are returned. I.e. the result is **not** all studies between two time points on consecutive dates. If this is required, the SCU must do a query on date range only, requiring time in return and filter out the required studies himself. If Study Date is not specified and Study Time is specified as a range an implicit Study Date of today is assumed, i.e. all studies between the two time points on the day the query is done is returned.

Wildcard matching on date and time is not supported. The result is undefined.

If no matches are found, a response with "SUCCESS" is sent.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, "Supported transfer syntaxes (Wise (Unix))".

4.4.3.3 Retrieve Images from the WISE Database

Associated Real-World Activity

A remote application entity wishes to retrieve images from the WISE database using the `C-MOVE` command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the MOVE SOP classes of the Q/R service class as SCP.

In case of no matching examinations, a response of "SUCCESS" is returned to the association initiator.

If the association to the move destination is rejected a response “Unable to process” (C001) is returned to the association initiator.

If the move destination is unknown (not defined in the configuration file) a response “Destination unknown” (A801) is returned to the association initiator.

For other errors a response “Out of resources” (A702) is returned to the association initiator.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, “Supported transfer syntaxes (Wise (Unix))”.

4.4.3.4 Information about Modality Performed Procedure Steps

Associated Real-World Activity

A remote application entity sends information about Modality Performed Procedure Steps using the `N-CREATE` or `N-SET` command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, “Supported SOP classes as SCP (WISE (Unix))” and Table 2.7, “Supported transfer syntaxes (Wise (Unix))”. Role is SCP.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the Modality Performed Procedure Step SOP Class under the Study Management service class as both SCU and SCP.

The Q/R SCP can be configured to relay the received information to other Modality Performed Procedure Step SCUs.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, “Supported transfer syntaxes (Wise (Unix))”.

4.5 MWL SCP AE Specification (WISE (UNIX))

4.5.1 Association Establishment Policies

4.5.1.1 General

The maximum PDU length that the MWL SCP AE will handle is configurable. Default is 28672 bytes (28 Kbytes). Only Sectra authorized personnel can change this configuration.

4.5.1.2 Number of Associations

The MWL SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

4.5.1.3 Asynchronous Nature

The MWL SCP AE will only allow a single outstanding operation on an association. Therefore, the MWL SCP AE will not perform asynchronous operations window negotiation.

4.5.1.4 Implementation Identifying Information

The MWL SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	UXMWLSCP_15_20

4.5.2 Association Initiation Policy

The MWL SCP AE will not initiate any associations.

4.5.3 Association Acceptance Policy

The MWL SCP AE will reject associations from applications that do not address it, i.e. specify an incorrect called AE title. The MWL SCP AE will also reject associations with C-FIND requests from hosts not present in the “hosts” database (DNS, `/etc/hosts`, etc.)

The MWL SCP AE accepts associations for the following events:

- Verification of the DICOM communication between a remote system and the MWL SCP AE
- Query of the WISE database for a worklist

4.5.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with the MWL SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

The MWL SCP AE provides standard conformance to the DICOM Verification Service Class.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, "Supported transfer syntaxes (Wise (Unix))".

4.5.3.2 Query of the WISE Database

Associated Real-World Activity

A remote system requests a worklist using the `C-FIND` command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.6, "Supported SOP classes as SCP (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCP.

SOP Specific Conformance

The MWL SCP AE provides standard conformance to the DICOM Basic Worklist Management service class as SCP with the following exceptions:

- Fractions of seconds are ignored.
- At most 200 matches are returned. The hit limit can be configured. If there are more items than the hit limit in the WISE database, zero matches are returned.

appendix F Key List for MWL C-FIND-RQ lists all attributes that are supported as matching and return keys.

Case insensitive matching is used for patient name. For all other attributes, case sensitive matching is used.

Range matching is supported for both Study Date and Study Time. If both Study Date and Study Time are specified as a range, e.g. date1 - date2 and time1 - time2, all studies between date1.time1 and date2.time2 are returned. I.e. the result is **not** all studies between two time points on consecutive dates. If this is required, the SCU must do a query on date range only, requiring time in return and filter out the required studies himself. If Study Date is not specified and Study Time is specified as a range an implicit Study Date of today is assumed, i.e. all studies between the two time points on the day the query is done is returned.

Wildcard matching on date and time is not supported. The result is undefined.

If no matches are found, a response with "SUCCESS" is sent.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.7, “Supported transfer syntaxes (Wise (Unix))”.

4.6 Notif SCU AE Specification (WISE (UNIX))

4.6.1 Association Establishment Policies

4.6.1.1 General

The maximum PDU size that the Notif SCU AE will handle is 28672 bytes (28 Kbytes).

4.6.1.2 Number of Associations

The Notif SCU AE can only handle one association at a time. One send-request has to be finished before the next is started.

4.6.1.3 Asynchronous Nature

The Notif SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

4.6.1.4 Implementation Identifying Information

The Notif SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	SINOTSCU_15_20

4.6.2 Association Initiation Policy

4.6.2.1 Real-World Activity - Send Command

Associated Real-World Activity

If WISE is configured so, the Notif SCU sends a Basic Study Descriptor instance for a specific Study when the corresponding exam is approved. The Basic Study Descriptor object is typically sent to a RIS to indicate that an exam is made, and to indicate the number of images in the exam.

The Notif SCU can also be configured to send a Basic Study Descriptor instance on these events:

- An exam is retrieved from the archive.
- The last on-line copy of an exam is deleted.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.5, "Supported SOP classes as SCU (WISE (Unix))" and Table 2.7, "Supported transfer syntaxes (Wise (Unix))". Role is SCU.

SOP Specific Conformance

The Notif SCU sends all type 1 and type 2 attributes of the Basic Study Descriptor IOD. No type 3 attributes are sent.

If configured so the Notif SCU can send a standard extended type of the Basic Study Descriptor IOD, see section 10.3.1 Basic Study Content Notification SOP Class for details.

4.6.3 Association Acceptance Policy

The Notif SCU AE does not handle incoming associations.

5 WISE (win) AE Specifications

The following topics are included in this chapter:

5.1 Storage SCU AE Specification (WISE (win))

5.1.1 Association Establishment Policies

5.1.1.1 General

The maximum PDU size that the Storage SCU AE will handle is 28672 bytes (28 Kbytes).

5.1.1.2 Number of Associations

The Storage SCU AE can only handle one association at a time. One send request has to be finished before the next is started.

5.1.1.3 Asynchronous Nature

The Storage SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

5.1.1.4 Implementation Identifying Information

The Storage SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	SISTOSCU_15_20

5.1.2 Association Initiation Policy

5.1.2.1 Real-World Activity - Send Command

Associated Real-World Activity

As described in User's Guide IDS5 [4] the IDS5 workstation user selects examinations to send from the information window. Then he or she issues the send command by selecting the desired destination. The command is forwarded to WISE, which will activate the Storage SCU AE indicating the examinations, and destination that the user has chosen. The Storage SCU AE will then initiate an association with the remote AE, hopefully supporting DICOM Storage as SCP.

Image Sending can also be activated as a result of a C-MOVE request towards the Q/R SCP or when archiving images using ImageServer/xd.

Proposed Presentation Contexts

Possible proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 2.8, "Supported SOP classes as SCU (Wise (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". At most three transfer syntaxes are proposed at the same time. Implicit Little Endian is always pi.e.roposed. If the image is internally stored using another transfer syntax, that syntax is proposed too. If configured so, compression transfer syntax will be proposed too.

Role is SCU.

SOP Specific Conformance

The Storage SCU provides standard conformance to the supported SOP classes in the Storage Service Class.

If patient or exam data for exported images has been changed in WISE, the exported images will contain the values from WISE. If WISE has been configured to support multiple issuers then the exported DICOM object will contain (0010,0021) Issuer of Patient ID and the receiving side must check both (0010,0020) Patient ID and (0010,0021) Issuer of Patient ID in the exported DICOM objects to uniquely identify a patient. If WISE also has been configured for patient linking an export issuer can be configured. If a patient does not have information for the configured export issuer then information for another issuer will be used. Again the receiving side must check both (0010,0020) Patient ID and (0010,0021) Issuer of Patient ID in the exported DICOM objects to uniquely identify a patient.

If settings and annotations have been made in the default setting for images in IDS5, this information will be exported as Standard Grayscale Presentation State if the receiving side supports such (see appendix D Exported Presentation States for details), otherwise the annotations will be exported standard DICOM overlays.

If the IDS5 user changes an existing default setting the SOP Instance UID of the associated presentation state will be changed. The old setting will not be saved.

If configured so, the Storage SCU AE will export Sectra private attributes. These are documented in appendix C Sectra Private Attributes.

5.1.3 Association Acceptance Policy

The Storage SCU AE does not handle incoming associations.

5.2 Storage SCP AE Specification (WISE (win))

5.2.1 Association Establishment Policies

5.2.1.1 General

The maximum PDU-length, which a Storage SCP AE will handle, is configurable. The default is 28672 bytes (28 Kbytes). Configuration can only be done by Sectra authorized personnel. Allowed values are between 4096 bytes (4 Kbytes) and 131072 bytes (128 Kbytes) including these values.

5.2.1.2 Number of Associations

Each Storage SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

Note: More than one association at the same time from a single Storage SCU AE is not supported.

Any number of Storage SCP AEs can be set up, meaning that a great number of C-STORE associations can be handled at the same time. Typically one Storage SCP AE per sending application is set up. In practice, the number of Storage SCP AEs and simultaneous C-STORE associations are limited by the system capabilities, e.g. network bandwidth, server memory size and filesystem performance.

5.2.1.3 Asynchronous Nature

A Storage SCP AE will only allow a single outstanding operation on an association. Therefore, a Storage SCP AE will not perform asynchronous operations window negotiation.

5.2.1.4 Implementation Identifying Information

A Storage SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WISTOSCP_15_20

5.2.2 Association Initiation Policy

Storage SCP will not initiate association.

5.2.3 Association Acceptance Policy

A Storage SCP AE **rejects** associations in the following situations:

- Association requests from applications that do not address it, i.e. specify an incorrect called AE title.
- If configured so, association requests from hosts with host names not known to the Storage SCP AE host.
- For image transfers if it is already processing the maximum number of associations that it can handle (default: 5).
- For image transfers and if configured so, if the WISE server is not responding.

A Storage SCP AE **accepts** associations for the following events:

- Verification of the DICOM communication between a remote system and a Storage SCP AE.
- Transfer of images from a remote system to the WISE database.
- Request for Storage Commitment to store images in WISE.

5.2.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with a Storage SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

A Storage SCP AE provides standard conformance to the DICOM Verification Service Class.i.e.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.2.3.2 Transfer of Images from a Remote System to the WISE database

Associated Real-World Activity

A remote system wants to store images in the WISE database.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

A Storage SCP AE provides standard level 2 (full) conformance to the DICOM Storage Service Class as SCP. Full conformance mean that all type 1, 2 and 3 attributes sent are stored. All private and retired attributes are also stored. However, any element that is received with an explicitly encoded value representation that is different from the standard value representation for that element will be discarded.

A Storage SCP AE needs a value of the attribute (0010, 0020), Patient ID. If the attribute is empty it will use the attribute (0010, 0010), Patient Name, as patient ID. If the patient name is empty as well it will use the request number (see System Administrators's Guide ImageServer/s HP-UX [9]) as patient ID. Applications sending image to a Storage SCP AE must take care when filling in the Patient ID attribute. If it is not filled in, there is a risk that images of different patients can be mixed!

If the image storage should fail on the WISE side, a status of refused, "Out of resources", will be returned to the association initiator.

WISE can be configured to overwrite images with same SOP Instance UID or to store all images it receives. Default is the second alternative, i.e. not to overwrite images with same SOP Instance UID. This means that if the same image is sent twice to a Storage SCP AE it will be stored two times in WISE. This implicates that two images with the same SOP Instance UID will be sent if a MOVE request is received by the Q/R SCP AE on that image.

For more detailed information about the handling of specific attributes by WISE and IDS5, see Appendix A.

If DICOM attributes are illegal, no responsibilities for consequences are taken.

Regarding viewing capabilities of IDS5 the following points must be noted

- Multi-frame images in one dimension can be viewed in IDS5; multi dimensional on the other hand cannot be viewed correctly. They will behave as a one-dimensional image; showing them will do so with images in a random order.
- IDS5 shows images with non-square pixels as if the pixels where square. It is possible to configure image import in WISE so that non-square pixels are transformed to square pixels.

Regarding color images, IDS5 can only display those with Photometric interpretation, (0028, 0004), equal to

- RGB with 24 bits (8 bits per channel)
- PALETTE_COLOR
- YBR_FULL_422
- YBR_FULL

Images are handled color-by-pixel internally in WISE and IDS5. In certain circumstances image that are sent color-by-plane to WISE/IDS5 are sent color-by-pixel if fetched from IDS5/WISE.

The first LUT in a Modality LUT sequence, attribute (0028, 3000), is handled. The rest (second, third and so on) are ignored.

IDS5 has full support of DICOM Overlays, however if multiple overlays are present in an image you can only choose between shVerification of the DICOM communication between a remote system and the Q/R SCP AEowing no DICOM overlays or all DICOM overlays.

Regarding color images, IDS7 can only view those with (0028,0004), Photometric interpretation, equal to

- RGB
- PALETTE_COLOR
- YBR_FULL_422 (jpeg-compressed)
- YBR_FULL

5.2.3.3 Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

5.2.3.4 Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.2.3.5 Request to Commit to Store Images in the WISE Database

Associated Real-World Activity

A remote system makes a request for WISE to commit to store a number of images.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

The Storage SCP AE provides standard conformance to the Storage Commitment Push Model SOP Class.

Notes about the implementation:

An attempt will be made to transmit the N-EVENT-REPORT-RQ message on the same association as the N-ACTION-RQ message was received. If the association is down, the Storage SCP AE will open a new association to the Storage Commitment SCU and send the N-EVENT-REPORT-RQ message on the new association. The time between the reception of the N-ACTION-RQ message and the sending of the N-EVENT-REPORT-RQ message is dependent on the WISE server load, but it can be expected to be short (seconds). To minimize possible error situations the SCU is recommended to keep the association open after the N-ACTION is sent.

Any time after the images have been committed with Storage Commitment, they can be deleted by an IDS5 user, **i.e.** a Storage Commitment will not make sure that the images will be stored permanently.

Committed images can be retrieved using DICOM Query/Retrieve towards a Q/R SCP AE connected to the same WISE server. If a Q/R SCP is connected towards the WISE server at time of commitment, the AE title of it will be returned in the N-EVENT-REPORT message sent to the SCU.

Storage Commitment can be made for images stored on short-term (RAID) or long-term storage (Archive).

The optional Storage Media File-Set ID & UID attributes will never be filled in by the Storage SCP AE.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.3 Q/R SCU AE Specification (WISE (win))

5.3.1 Association Establishment Policies

5.3.1.1 General

The maximum PDU size that the Q/R SCU AE will handle is 16384 bytes (16 Kbytes).

5.3.1.2 Number of Associations

The Q/R SCU AE can only handle one association at a time.

5.3.1.3 Asynchronous Nature

The Q/R SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

5.3.1.4 Implementation Identifying Information

The Q/R SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WIQRSCU_15_20

5.3.2 Association Initiation Policy

5.3.2.1 Real-World Activity - Fetch from DICOM archive Command

Associated Real-World Activity

This command is invoked when an archive retrieval from an external DICOM archive is preformed. It will search and retrieve requested studies from the external DICOM archive.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.8, “Supported SOP classes as SCU (Wise (win))” and Table 2.10, “Supported Transfer Syntaxes (WISE (win))”. Role is SCU.

SOP Specific Conformance

The Q/R SCU provides standard conformance to used SOP Classes in the Q/R Service Class.

5.3.3 Association Acceptance Policy

The Q/R SCU AE does not handle incoming associations.

5.4 Q/R SCP AE Specification (WISE (win))

5.4.1 Association Establishment Policies

5.4.1.1 General

The maximum PDU-length that the Q/R SCP AE will handle is configurable. Default is 28672 bytes (28 Kbytes). Configuration can only be done by Sectra authorized personnel. Allowed values are between 4096 bytes (4 Kbytes) and 131072 bytes (128 Kbytes) including these values.

5.4.1.2 Number of Associations

Each Q/R SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

5.4.1.3 Asynchronous Nature

The Q/R SCP AE will only allow a single outstanding operation on an association. Therefore, the Q/R SCP AE will not perform asynchronous operations window negotiation.

5.4.1.4 Implementation Identifying Information

The Q/R SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WIQRSCP_15_20

5.4.2 Association Initiation Policy

The Q/R SCP AE will not initiate any associations. When a retrieve request is forwarded to the Q/R SCP, the images will be copied using the Storage SCU AE.

5.4.3 Association Acceptance Policy

The Q/R SCP AE will reject associations from applications that do not address it, i.e. specify an incorrect called AE title. The Q/R SCP AE will also reject association requests from unknown hosts.

The Q/R SCP AE accepts associations for the following events:

- Verification of the DICOM communication between a remote system and the Q/R SCP AE
- Query of the WISE database
- Retrieve images from the WISE database

5.4.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with the Q/R SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the DICOM Verification Service Class.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.4.3.2 Query of the WISE Database

Associated Real-World Activity

A remote system wants to query the WISE database using the C-FIND command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP. Extended negotiation is not supported.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the FIND SOP classes of the Q/R Service Class as SCP with the exceptions below:

- Fractions of seconds are ignored.
- At the most 200 matches are returned. This hit limit can be configured. If more items than the hit limit in the WISE database matches, zero matches are returned.

appendix B Key List for Q/R C-FIND-RQ summarizes which keys can be used for searching.

Relational queries are not supported.

Case insensitive matching is used for patient name. For all other attributes, case sensitive matching is used.

Range matching is supported for both Study Date and Study Time. If both Study Date and Study Time are specified as a range, e.g. date1 - date2 and time1 - time2, all studies between date1.time1 and date2.time2 are returned. I.e. the result is not all studies between two time points on consecutive dates. If this is required, the SCU must do a query on date range only, requiring time in return and filter out the required studies himself. If Study Date is not specified and Study Time is specified as a range an implicit Study Date of today is assumed, i.e. all studies between the two time points on the day the query is done is returned.

Wildcard matching on date and time is not supported. The result is undefined.

If WISE is configured to support multiple issuers then all C-FIND requests must contain (0010,0021) Issuer of Patient ID except for series and instance level queries when using the Study Root Query/Retrieve

Information Model. A Q/R SCP can be configured to use a fixed issuer, which will override any issuer given in a C-FIND request. A Query/Retrieve SCU must in such circumstances take the (0010,0021) Issuer of Patient ID in the received C-FIND response into account when evaluating which patient the response belongs to.

In case of no matching examinations, a response of "SUCCESS" is sent.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.4.3.3 Retrieve Images from the WISE Database

Associated Real-World Activity

A remote application entity wishes to retrieve images from the WISE database using the `C-MOVE` command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

The Q/R SCP AE provides standard conformance to the MOVE SOP classes of the Q/R Service Class as SCP.

In case of no matching examinations, a response of "SUCCESS" is returned to the association initiator.

If the association to the move destination is rejected a response "Unable to process" (C001) is returned to the association initiator.

If the move destination is unknown (not defined in the configuration file) a response "Destination unknown" (A801) is returned to the association initiator.

For other errors a response "Out of resources" (A702) is returned to the association initiator.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.5 MWL SCP AE Specification (WISE (win))

5.5.1 Association Establishment Policies

5.5.1.1 General

The maximum PDU length that the MWL SCP AE will handle is configurable. Default is 28672 bytes (28 Kbytes). Only Sectra authorized personnel can change this configuration.

5.5.1.2 Number of Associations

The MWL SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Configuration can only be done by Sectra authorized personnel.

5.5.1.3 Asynchronous Nature

The MWL SCP AE will only allow a single outstanding operation on an association. Therefore, the MWL SCP AE will not perform asynchronous operations window negotiation.

5.5.1.4 Implementation Identifying Information

The MWL SCP AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	WIMWLSCP_15_20

5.5.2 Association Initiation Policy

The MWL SCP AE will not initiate any associations.

5.5.3 Association Acceptance Policy

The MWL SCP AE will reject associations from applications that do not address it, i.e. specify an incorrect called AE title. The MWL SCP AE will also reject associations with C-FIND requests from hosts not present in the “hosts” database (DNS, `/etc/hosts`, etc.)

The MWL SCP AE accepts associations for the following events:

- Verification of the DICOM communication between a remote system and the MWL SCP AE
- Query of the WISE database for a worklist

5.5.3.1 Verification of the Communication

Associated Real-World Activity

A remote system wants to verify the DICOM communication with the MWL SCP AE.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

The MWL SCP AE provides standard conformance to the DICOM Verification Service Class.

Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.5.3.2 Query of the WISE Database

Associated Real-World Activity

A remote system requests a worklist using the `C-FIND` command.

Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.9, "Supported SOP classes as SCP (WISE (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCP.

SOP Specific Conformance

The MWL SCP AE provides standard conformance to the DICOM Basic Worklist Management service class as SCP with the following exceptions:

- Fractions of seconds are ignored.
- At most 200 matches are returned. The hit limit can be configured. If there are more items than the hit limit in the WISE database, zero matches are returned.

appendix F Key List for MWL C-FIND-RQ lists all attributes that are supported as matching and return keys.

Case insensitive matching is used for patient name. For all other attributes, case sensitive matching is used.

Range matching is supported for both Study Date and Study Time. If both Study Date and Study Time are specified as a range, e.g. date1 - date2 and time1 - time2, all studies between date1.time1 and date2.time2 are returned. I.e. the result is **not** all studies between two time points on consecutive dates. If this is required, the SCU must do a query on date range only, requiring time in return and filter out the required studies himself. If Study Date is not specified and Study Time is specified as a range an implicit Study Date of today is assumed, i.e. all studies between the two time points on the day the query is done is returned.

Wildcard matching on date and time is not supported. The result is undefined.

If no matches are found, a response with "SUCCESS" is sent.

Presentation Context Acceptance Criterion

The intersection between the proposed and acceptable Presentation Contexts is taken for the established association.

Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 2.10, "Supported Transfer Syntaxes (WISE (win))".

5.6 Notif SCU AE Specification (WISE (win))

5.6.1 Association Establishment Policies

5.6.1.1 General

The maximum PDU size that the Notif SCU AE will handle is 28672 bytes (28 Kbytes).

5.6.1.2 Number of Associations

The Notif SCU AE can only handle one association at a time. One send-request has to be finished before the next is started.

5.6.1.3 Asynchronous Nature

The Notif SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

5.6.1.4 Implementation Identifying Information

The Notif SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7
Implementation version name	SINOTSCU_15_20

5.6.2 Association Initiation Policy

5.6.2.1 Real-World Activity - Send Command

Associated Real-World Activity

If WISE is configured so, the Notif SCU sends a Basic Study Descriptor instance for a specific Study when the corresponding exam is approved. The Basic Study Descriptor object is typically sent to a RIS to indicate that an exam is made, and to indicate the number of images in the exam.

The Notif SCU can also be configured to send a Basic Study Descriptor instance on these events:

- An exam is retrieved from the archive.
- The last on-line copy of an exam is deleted.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.8, "Supported SOP classes as SCU (Wise (win))" and Table 2.10, "Supported Transfer Syntaxes (WISE (win))". Role is SCU.

SOP Specific Conformance

The Notif SCU sends all type 1 and type 2 attributes of the Basic Study Descriptor IOD. No type 3 attributes are sent.

If configured so the Notif SCU can send a standard extended type of the Basic Study Descriptor IOD, see section 10.3.1 Basic Study Content Notification SOP Class for details.

5.6.3 Association Acceptance Policy

The Notif SCU AE does not handle incoming associations.

6 SHS AE Specifications

The following topics are included in this chapter:

6.1 Q/R SCU AE Specification

6.1.1 Association Establishment Policies

6.1.1.1 General

The maximum PDU size that the Q/R SCU AE will handle is not limited. But it can be configured to a certain size.

6.1.1.2 Number of Associations

The Q/R SCU AE can only handle one association at a time. One Q/R request is finished before the next is started.

6.1.1.3 Asynchronous Nature

The Q/R SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

6.1.1.4 Implementation Identifying Information

The Q/R SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.10.4.2
Implementation version name	SHQRSCU_12_2

6.1.2 Association Initiation Policy

6.1.2.1 Real-World Activity - Q/R Find

Associated Real-World Activity

A user creates a search or a worklist containing one or several Q/R SCPs. Then the user defines the search criteria to be used and the search or worklist search is performed. When several Q/R SCPs are defined for a search or worklist they are queried in sequence.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.11, "Supported SOP classes as SCU (SHS)" and Table 2.12, "Supported transfer syntaxes (SHS)". Role is SCU.

SOP-Specific Conformance

The Q/R SCU provides standard conformance to the Q/R service class.

6.1.2.2 Real-World Activity - Import

Associated Real-World Activity

When responses are received from a search, as described in section above, the user can select one or several of the matching studies to fetch them from the Q/R SCP. The images are sent to a configured destination, usually a Storage SCP AE on the WISE.

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.11, "Supported SOP classes as SCU (SHS)" and Table 2.12, "Supported transfer syntaxes (SHS)". Role is SCU.

SOP-Specific Conformance

The Q/R SCU provides standard conformance to the Q/R service class.

6.1.3 Association Acceptance Policy

The Q/R SCU AE does not handle incoming associations.

6.2 Print SCU AE Specification

6.2.1 Association Establishment Policies

6.2.1.1 General

The maximum PDU size that the Print SCU AE will handle is not limited. But it can be configured to a certain size.

6.2.1.2 Number of Associations

The Print SCU AE can handle several associations at a time.

6.2.1.3 Asynchronous Nature

The Print SCU AE does not support asynchronous operations and will not perform asynchronous window negotiation.

6.2.1.4 Implementation Identifying Information

The Print SCU AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.10.4.2

Implementation version name	SHPRISCU_12_2

6.2.2 Association Initiation Policy

6.2.2.1 Real-World Activity - Print Command

Associated Real-World Activity

As described in User's Guide IDS7 [16] the IDS7 workstation user chooses images to print from the matrix or image windows. When the user has collected the images to print, he or she issues the print command. This will open the print dialog were the user can choose the printer to print to and send the images to this printer. When this happens the Print SCU AE is activated, acts as an SCU and initiates an association with a remote AE, hopefully supporting DICOM Print Management as SCP (a DICOM printer).

Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2.11, "Supported SOP classes as SCU (SHS)" and Table 2.12, "Supported transfer syntaxes (SHS)". Role is SCU.

SOP-Specific Conformance

The Print SCU AE supports the mandatory SOP classes, which are defined under the Basic Grayscale Print Management Meta SOP Class, see Table 2.11, "Supported SOP classes as SCU (SHS)". No optional SOP classes are supported.

The Print SCU AE uses the following DIMSE Service Elements:

Table 6.1 DIMSE Service Elements

SOP Class	DIMSE Service Element
Basic Film Session SOP Class	N-CREATE, N-DELETE
Basic Film Box SOP Class	N-CREATE, N-DELETE, N-ACTION
Basic Grayscale Image Box SOP Class	N-SET
Presentation LUT SOP Class	N-CREATE

N-EVENT-REPORT is not supported.

The Print SCU AE supports the following SOP class attributes:

Table 6.2 SOP Class Attributes

SOP Class, DIMSE Service Element	Attribute name	Tag	Optional according to standard	Config-urable	Default value
Basic Film Session N-CREATE	Number of Copies	(2000,0010)	YES	YES	1
Basic Film Session N-CREATE	Print Priority	(2000,0020)	YES	YES	MED
Basic Film Session N-CREATE	Medium Type	(2000,0030)	YES	YES	BLUE FILM
Basic Film Session N-CREATE	Film Destination	(2000,0040)	YES	YES	MAGAZINE
Basic Film Box N-CREATE	Image Display Format	(2010,0010)	NO	NO	STANDARD\1,1
Basic Film Box N-CREATE	Film Orientation	(2010,0040)	YES	YES	PORTRAIT
Basic Film Box N-CREATE	Film Size ID	(2010,0050)	YES	YES	14INX17IN
Basic Film Box N-CREATE	Max Density	(2010,0130)	YES	YES	(none)
Basic Film Box N-CREATE	Border Density	(2010,0100)	YES	YES	(none)
Basic Film Box N-CREATE	Empty Image Density	(2010,0110)	YES	YES	(none)
Basic Film Box N-CREATE	Min Density	(2010,0120)	YES	YES	(none)
Basic Film Box N-CREATE	Illumination	(2010,015E)	YES	YES	(none)
Basic Film Box N-CREATE	Reflected Ambient Light	(2010,0160)	YES	YES	(none)
Basic Film Box N-CREATE	Referenced Presentation LUT Sequence	(2050,0500)	YES	YES	(none)
Basic Film Box N-CREATE	>Referenced SOP Class UID	(0008,1150)	YES	YES	(none)
Basic Film Box N-CREATE	>Referenced SOP Instance UID	(0008,1155)	YES	YES	(none)

Several images per film can be printed. They are arranged in IDS7, which composes them and sends them as one big image (Image Display Format “STANDARD\1,1”).

6.2.3 Association Acceptance Policy

The Print SCU AE does not handle incoming associations.

7 IDS5 DICOM Media AE Specification

The following topics are included in this chapter:

7.1 Implementation Model

7.1.1 Application Data Flow Diagram

See section 2.1.1 IDS5 Application Flow Diagram.

7.1.2 Functional Definitions of AEs

The DICOM Media AE is located in IDS5 product and provides Standard Conformance to the DICOM Media Storage Service and File Format (PS 3.10 in Digital Imaging and Communications in Medicine (DICOM). NEMA Standard Publications PS 3.1-16 and Supplements. [1]. It supports the General Purpose CD-R and DVD Interchange Profiles with the exceptions mentioned below. The functionality is intended for the CD-R media but the implementation has left the actual CD creation to any third party product that can write a directory structure to a CD. For this reason DVD-RAM can also be used as media, if a third party DVD-RAM product is used.

7.1.3 Sequencing of Real World Activities

Not applicable.

7.1.4 File Meta Information

The DICOM Media AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.3.3.25.7

Implementation version name	WIMEFSCR_11_40

7.2 AE specifications

7.2.1 IDS5 AE specification

Supported APs	Real-World Activity	Roles	SC Option
STD-GEN-CD	Import Media	FSR	Interchange
	Export Media	FSC	Interchange
STD-GEN-DVD-RAM	Import Media	FSR	Interchange
	Export Media	FSC	Interchange

See Table 2.1, "List of supported Storage SOP classes" for a list of SOP Classes supported for both import and export of media.

7.2.1.1 File Meta Information

The Source Application Entity Title is not used by IDS5.

Private Information from the IDS5 is not stored with the images. Private information, being part of the images before imported to the system, are not removed, thus are retained in the images upon export on media.

7.2.1.2 Real-World Activities

Import Media

IDS5 can choose to import a complete or parts of a complete file set acting as FSR. User will be presented with a tree structure presenting the selected file-set and can select which part to import.

Read more about this functionality in User's Guide IDS5 [4].

DICOMDIR keys

The mandatory DICOMDIR keys are required to present the tree structure in a correct way. This structure will show Patients, Studies and Series.

Optional keys are displayed if available.

Export Media

IDS5 can create a complete Multipatient file set to be written on CD acting as FSC.

When exporting to media, images are stored in one of the following transfer syntaxes

Transfer Syntax Name	Transfer Syntax UID
Explicit VR Little Endian	1.2.840.10008.1.2.1
Explicit VR Big Endian	1.2.840.10008.1.2.2
Implicit VR Little Endian	1.2.840.10008.1.2

Read more about this functionality in User's Guide IDS5 [4].

Creating DICOMDIR

All values needed for DICOMDIR file will be fetched from WISE, if a value does not exist; actual image file will be checked for information. If WISE data is used, image file will be updated according to it. This will ensure that the same information that is written in DICOMDIR file is in the image file.

Referenced Image Sequence is not written into the DICOMDIR file.

7.3 Augmented and Private Application Profiles

Not used.

7.4 Extensions, Specializations, and Privatizations of SOP Classes and Transfer Syntaxes

Not applicable.

7.5 Configuration

See chapter 11 Configuration.

7.6 Support of Extended Character Sets

See chapter 12 Support of Extended Character Sets.

7.7 Codes and Controlled Terminology

Not supported.

7.8 Security Profiles

Not supported.

8 IDS7 DICOM Media AE Specification

The following topics are included in this chapter:

8.1 Implementation Model

8.1.1 Application Data Flow Diagram

See section 2.1.4 SHS Application Flow Diagram.

8.1.2 Functional Definitions of AEs

The DICOM Media AE is located in IDS7 product and provides Standard Conformance to the DICOM Media Storage Service and File Format (PS 3.10 in Digital Imaging and Communications in Medicine (DICOM). NEMA Standard Publications PS 3.1-16 and Supplements. [1]. It supports the STD-GEN-CD and STD-GEN-DVD-RAM Media Storage Application Profiles to interchange DICOM information on interchangeable media. The product use Windows Image Mastering API (IMAPI) to leverage the built-in CD/DVD writing capabilities of Windows, making it possible to write to media from within IDS7. It is also possible to export to any folder location.

8.1.3 Sequencing of Real World Activities

Not applicable.

8.1.4 File Meta Information

The DICOM Media AE will provide the following implementation identifying information

Implementation Class UID	1.2.752.24.10.4.2

Implementation version name	SHMEFSRC_12_2

8.2 AE specifications

8.2.1 IDS7 AE specification

Supported APs	Real-World Activity	Roles	SC Option
STD-GEN-CD	Import Media	FSR	Interchange
	Export Media	FSC	Interchange
STD-GEN-DVD-RAM	Import Media	FSR	Interchange
	Export Media	FSC	Interchange

See Table 2.1, “List of supported Storage SOP classes” for a list of SOP Classes supported for import media by default. Additional SOP Classes can be configured. Export of media has basically the same list with the exception that it only handles SOP Classes with image data and the following:

- Grayscale Softcopy Presentation State Storage
- Color Softcopy Presentation State Storage
- Pseudo-Color Softcopy Presentation State Storage
- Blending Softcopy Presentation State Storage
- XA/XRF Grayscale Softcopy Presentation State Storage
- Basic Text Structured Report
- Enhanced Structured Report
- Comprehensive Structured Report
- Procedure Log
- Mammography CAD Structured Report
- Key Object Selection Document
- Chest CAD Structured Report
- X-Ray Radiation Dose Structured Report
- Colon CAD Structured Report
- Implantation Plan Structured Report

8.2.1.1 File Meta Information

The Source Application Entity Title is not used by IDS7.

Private Information from the IDS7 is not stored with the images. Private information, being part of the images before imported to the Sectra PACS, are not removed, thus are retained in the images upon export on media.

8.2.1.2 Real-World Activities

Import Media

IDS7 can choose to import a complete or parts of a complete file set acting as FSR. User will be presented with a tree structure presenting the selected file-set and can select which part to import.

Read more about this functionality in User's Guide IDS7 [16].

DICOMDIR keys

The mandatory DICOMDIR keys are required to present the tree structure in a correct way. This structure will show Patients, Studies and Series.

Export Media

IDS7 can create a complete Multipatient file set to be written on CD acting as FSC.

When exporting to media, images are stored in one of the following transfer syntaxes

Transfer Syntax Name	Transfer Syntax UID
Explicit VR Little Endian	1.2.840.10008.1.2.1

Read more about this functionality in User's Guide IDS7 [16].

Creating DICOMDIR

All values needed for DICOMDIR file will be fetched from SHS, if a value does not exist; actual image file will be checked for information. If SHS data is used, image file will be updated according to it. This will ensure that the same information that is written in DICOMDIR file is in the image file.

Referenced Image Sequence is not written into the DICOMDIR file.

8.3 Augmented and Private Application Profiles

Not used.

8.4 Extensions, Specializations, and Privatizations of SOP Classes and Transfer Syntaxes

Not applicable.

8.5 Configuration

See chapter 11 Configuration.

8.6 Support of Extended Character Sets

See chapter 12 Support of Extended Character Sets.

8.7 Codes and Controlled Terminology

Not supported.

8.8 Security Profiles

Not supported.

9 Communication Profiles

The following topics are included in this chapter:

9.1 Supported Communication Stacks

All AEs described in this conformance statement provide DICOM 3.0 TCP/IP Network Communication Support as defined in part eight of the DICOM Standard.

9.2 TCP/IP Stack

The AEs uses the TCP/IP stack built into their respective operating system. For more information about operating systems consult their manuals.

9.2.1 Physical Media Support

All AEs are neutral to the physical medium over which TCP/IP executes. They can e.g. be used with fiber optics, token ring, Ethernet and twisted pair.

9.3 OSI Stack

Not supported.

9.4 Point-To-Point Stack

Not supported.

10 Extensions / Specializations / Privatizations

The following topics are included in this chapter:

10.1 Transfer Syntaxes

The Sectra Compression and Sectra Compression LS Transfer Syntaxes can be used between different components. The UID of the Transfer Syntaxes are 1.2.752.24.3.7.6 and 1.2.752.24.3.7.7.

10.2 Private Attributes

See appendix C Sectra Private Attributes.

10.3 Standard extended SOP Classes

10.3.1 Basic Study Content Notification SOP Class

If configured so the Notif SCU AE of WISE (both UNIX and win) can send an extended version of the Basic Study Content Notification SOP Class, were the Basic Study Descriptor IOD is enhanced with the following attributes:

Attribute Name	Tag	Type	Attribute Description
Study Date	(0008,0020)	3	Date the study started
Study Time	(0008,0030)	3	Time the study started
Accession Number	(0008,0050)	3	A RIS generated number that identifies the order for the study
Patient's Birth Date	(0010,0030)	3	Birth date of the patient
Patient's Sex	(0010,0040)	3	Sex of the named patient

Attribute Name	Tag	Type	Attribute Description
Study Comments	(0032,4000)	3	User defined comments about the study. Used values (these are configurable): ADD (indicating that the study has been added to the PACS) DELETE (indicating that the last on-line copy of the examination had been deleted)

10.3.2 Overlay Plane and Multi-frame Overlay modules

If configured so the Storage SCU AE will include annotations etc. done in the system as overlays in images. This applies both to Q/R C-MOVE requests done towards WISE and to images exported as a consequence of a user request on IDS5/IDS7. Also, this applies to both WISE(Win) and WISE(Unix).

When such annotations are included in the images, it is done regardless of the IOD. This means that IOD:s that in the DICOM standard do not contain Overlay Plane and/or Multi-frame Overlay modules will do so, and hence being a standard extended SOP Class when exported. E.g. annotations are made with the IDS5/IDS7 on a US-MF image (which do not contain the Multi-frame Overlay module in DICOM), can be exported in the Multi-frame Overlay module.

11 Configuration

The following topics are included in this chapter:

11.1 IDS5

Configuration files are found in the `<XXX>\Sectra\IDS5\config\...` directory where <XXX> is specified at installation. See Installation Guide IDS5 [2].

11.1.1 Storage SCP

More information about configuration for Storage SCP can be found in System Administrator's Guide IDS5 [3].

11.1.1.1 Configuration file

The file `ctnstore_scp.def` contains configuration for Storage SCP.

11.1.1.2 AE title

Default AE Title is first part of host name in uppercase with an additional STORE behind it.

Example: host = john.net => AE title = JOHNSTORE

11.1.1.3 Port

Default port is 7820.

11.1.2 Q/R-MWL SCU

More information about configuration for Q/R-MWL SCU can be found in System Administrator's Guide IDS5 [3].

11.1.2.1 Configuration file

The file `data_cache.def` contains configuration for Q/R-MWL SCU.

11.1.3 Print SCU

More information about configuration for Print SCU can be found in System Administrator's Guide IDS5 [3].

11.1.3.1 Configuration file

The file `dicom_printer.def` contains configuration for Print SCU.

11.1.3.2 AE Title

The default AE title is `DICOM_PRINT_SCU`.

11.1.3.3 Remote AE

The remote Applications Entity's AE-title, host name and port number are specified the above-mentioned configuration file. Each remote AE is specified in its own section of the file. Default AE title is `PRINT_SERVER_SCP`.

11.1.4 Stack sorting

In IDS5 the following attributes are used for stack sorting:

- Sort by position - Attribute (0020, 1041), 'Slice Location'
- Sort by time - Attribute (0008, 0023), 'Content Date' and attribute (0008, 0033), 'Content Time'
- Sort by slice number - Attribute (0020, 0013) 'Instance Number'
- Sort by echo time - Attribute (0018,0081), 'Echo Time'
- Sort by temporal position ID - Attribute (0020, 0100), 'Temporal Position Identifier'

11.1.5 DICOM Media

More information about configuration for DICOM Media can be found in System Administrator's Guide IDS5 [3].

11.1.5.1 Configuration file

The file `cd_export_import.def` contains configuration for DICOM Media.

11.2 IDS7

Configuration is done in Sectra Enterprise Manager. See System Administrator's Guide Sectra Healthcare System [17].

11.2.1 DICOM Media

More information about configuration for DICOM Media can be found in System Administrator's Guide Sectra Healthcare System [17].

11.2.2 Stack sorting

In IDS7 the following attributes are used for stack sorting:

- Sort by position - Attribute (0020, 0032), 'Image Position (Patient)'
- Sort by orientation - Attribute (0020, 0037), 'Image Orientation (Patient)'
- Sort by time - Attribute (0008, 0023), 'Content Date' and attribute (0008, 0033), 'Content Time'
- Sort by slice number - Attribute (0020, 0013) 'Instance Number'

11.3 WISE (UNIX)

11.3.1 Storage SCU

The configuration is specified in the teleradiology section of the System Administrator's Guide WISE HP-UX [7]

11.3.1.1 Configuration

The WISE database contains configuration for the Storage SCU. The configuration is contained in a config data entry with the tag DEST_CONFIGURATION.

11.3.1.2 Remote AE

The remote Applications Entities AE-title, host name and port number are specified in the WISE database in the config data entry mentioned above and can be modified using the tool `w_config_telerad`. More details can be found in the teleradiology section of the System Administrator's Guide WISE HP-UX [7].

11.3.2 Storage SCP

11.3.2.1 AE title

The AE title of each AE can be configured. This is done running WISE/tools or the administration program `/opt/sectra/bin/dcm_adm` as described in the Installation Guide ImageServer/s HP-UX [8]. Any number of AEs can be set up. The default AE title is `DICOM_STORAGE`.

11.3.2.2 Port

The listen port of each AE can be also configured with WISE/tools or the administration program `/opt/sectra/bin/dcm_adm`. You can either set a listen port yourself or let the program automatically select a free listen port.

11.3.2.3 Remote AE

The remote Applications Entity's AE-title does not have to be specified. A Storage SCP AE will accept any AE-title. However by default the remote hosts host name must be known to the Storage SCP hosts, e.g. be present in the `/etc/hosts` file.

11.3.2.4 Additional configuration

For further configuration see the Installation Guide ImageServer/s HP-UX [8] and System Administrators's Guide ImageServer/s HP-UX [9].

11.3.3 Q/R SCU

Configuration of the Q/R SCU is done using the `w_config_xd` program. This program allows setting of the remote Application Entities AE-titles, host names and port numbers. More information can be found in the System Administrator's Guide ImageServer/fs, ImageServer/xd [13].

11.3.4 Q/R SCP

11.3.4.1 AE title

The AE title can be configured. This is done using the administration program `/opt/sectra/bin/w_config_qr` as described in the Installation Guide ImageServer/s HP-UX [8]. Any number of AEs can be set up. The default AE-title is `QR_SCP_WISE`. The same AE title is also used when the Q/R SCP turns into a Storage SCU as a result of a C-MOVE request.

11.3.4.2 Port

The listen port of the Q/R SCP AE can be configured. This is done using the administration program `/opt/sectra/bin/w_config_qr` as described in the Installation Guide ImageServer/s HP-UX [8]. The default is 7632.

11.3.4.3 Remote AE

The remote Applications Entity's AE-title, host name and port number are specified using the administration program `/opt/sectra/bin/w_config_qr` as described in the Installation Guide ImageServer/s HP-UX [8]. By default the remote host's host name must be known to the Q/R SCP host, e.g. be present in the `/etc/hosts` file. Note that all C-MOVE destinations also have to be specified. The setup is described in detail in the Installation Guide ImageServer/s HP-UX [8]

11.3.4.4 Additional configuration

For further configuration see the Installation Guide ImageServer/s HP-UX [8] and System Administrators's Guide ImageServer/s HP-UX [9].

11.3.5 MWL SCP

Configuration of the MWL SCP is done using the program `/opt/sectra/bin/w_config_mwlscp`. This program allows setting of the Application Entity title, listen port number, etc. More information can be found in the System Administrator's Guide WISE HP-UX [7].

11.3.6 Notif SCU

Configuration is described in the System Administrator's Guide WISE HP-UX [7].

11.3.6.1 Configuration file

The file `/etc/opt/sectra/wise_ris.def` contains configuration for Notif SCU.

11.3.6.2 Remote AE

The remote Application Entity's AE-title, host name and port number are specified in the above-mentioned file. The default value of the AE-title is SCN_SCP.

11.4 WISE (win)

Configuration files can be found in `<XXX>\Sectra\WISE\Config\...` where <XXX> is specified at installation. See installation guides for WISE on Windows.

11.4.1 Storage SCU

The Storage SCU configuration is specified in the teleradiology section of the System Administrator's Guide WISE Win [11]

11.4.1.1 Configuration

The WISE database contains configuration for the Storage SCU. The configuration is contained in a config data entry with the tag DEST_CONFIGURATION.

11.4.1.2 Remote AE

The remote Applications Entities AE-title, host name and port number are specified in the WISE database in the config data entry mentioned above and can be modified using the tool `w_config_telerad`. More details can be found in the teleradiology section of the System Administrator's Guide WISE Win [11].

11.4.2 Storage SCP

11.4.2.1 Configuration file

The file `ctn_store.def` contains configuration for Storage SCP.

11.4.2.2 AE title

Default AE title is `DICOM_STORAGE`.

11.4.2.3 Port

Default port is 7810.

11.4.2.4 Remote AE

Storage SCP must recognize remote hosts.

11.4.3 Q/R SCU

Configuration of the Q/R SCU is done using the `w_config_xd` program. This program allows setting of the remote Application Entities AE-titles, host names and port numbers. More information can be found in the System Administrator's Guide ImageServer/fs, ImageServer/xd [13].

11.4.4 Q/R SCP

11.4.4.1 Configuration file

The file `ctn_qrscp.def` contains configuration for Q/R SCP.

11.4.4.2 AE title

Default AE title is DICOM_QR_SCP.

11.4.4.3 Port

Default port is 7840.

11.4.4.4 Remote AE

Storage SCP must recognize remote hosts.

11.4.5 MWL SCP

Configuration of the MWL SCP is done using the program `w_config_mwlscp`. This program allows setting of the Application Entity title, listen port number, etc. More information can be found in the System Administrator's Guide WISE Win [11].

11.4.6 Notif SCU

Configuration is described in the System Administrator's Guide WISE Win [11].

11.4.6.1 Configuration file

The file `wise_ris.def` contains configuration for Notif SCU.

11.4.6.2 Remote AE

The remote Application Entity's AE-title, host name and port number are specified in the above-mentioned file. The default value of the AE-title is SCN_SCP.

11.5 SHS

Configuration is stored in Sectra Healthcare Database. See system administration guides for SHS.

11.5.1 Q/R SCU

Configuration of the Q/R SCU is done using the Sectra Enterprise Manager. There the remote Application Entities AE-titles, host names and port numbers are configured. More information can be found in the System Administrator's Guide Sectra Healthcare System [17].

11.5.2 Print SCU

More information about configuration for Print SCU can be found in System Administrator's Guide Sectra Healthcare System [17].

11.5.2.1 AE Title

The default AE title is `IDS7_PRINT_SCU`.

11.5.2.2 Remote AE

The remote Applications Entity's AE-title, host name and port number are specified in the configuration created in Sectra Enterprise Manager as mentioned above.

12 Support of Extended Character Sets

All AEs provide support for the ISO_IR 100 (Latin 1) extended character set except Print SCU AE. However, note that all text in the images is passed to the printer in the image data itself. This means that all overlay text appears on the printed medium in the same way as on the screen. IDS5 handles most character repertoires used in Western Europe. IDS7 handles Unicode characters which covers most of the world's writing systems.

With specific configuration, the WISE (win) implementation of the Storage SCP and the Q/R SCP AE:s support the character set ISO 2022 IR 87. The Q/R SCP does not support non-ASCII search keys, but supports returning values with ISO 2022 IR 87.

A Attribute List for Storage SCP

This list contains the DICOM attributes that are used by a Storage SCP AE by default. Please note that the default behavior can be changed for both WISE and IDS5. The comments give indication what the attributes are used for. If an attribute is not present in this list it is still stored by WISE but ignored by IDS5.

For the Print SCU AE attributes, see section 3.3 Print SCU AE Specification and section 6.2 Print SCU AE Specification. For supported attributes as keys for the Q/R SCP AE in a C-FIND request, see appendix B. For supported attributes in exported presentation states, see appendix D Exported Presentation States.

Table A.1 Attribute List for a Storage SCP AE

DICOM Attribute	Comment
(0008,0005) Specific Character Set	"ISO_IR 100" is supported.
(0008,0008) Image Type	1. Is used for determining default window setting in IDS5 if no window is included in the image. 2. Third value used by `w_store` in default scanogram finding method, and method " `-S A` " 3. A fourth value of X_CURVED_MPR is used by SHS to identify series exported from the Cross-Curved mode of IDS7 MPR.
(0008,0016) SOP Class UID	Stored in WISE image data (max 64 characters)
(0008,0018) SOP Instance UID	1. Stored in WISE image data (max 64 characters) 2. Required attribute for compression. 3. Used in `w_store` to overwrite equivalent image (if `-k` is not specified).
(0008,0020) Study Date	1. Stored in WISE examination data if value not found in RIS 2. Shown in all IDS5 image windows if present and (0008,0023) and (0008,0022) and (0008,0021) not present.
(0008,0021) Series Date	Shown in all IDS5 image windows if present and (0008,0023) and (0008,0022) not present.
(0008,0022) Acquisition Date	Shown in all IDS5 image windows if present and (0008,0023) not present.
(0008,0023) Image Date	If present, shown in all IDS5 image windows.
(0008,0030) Study Time	1. Stored in WISE examination data if value not found in RIS 2. Shown in all IDS5 image windows if present and (0008,0033) and (0008,0022) and (0008,0021) not present.
(0008,0031) Series Time	Shown in all IDS5 image windows if present and (0008,0033) and (0008,0032) not present.
(0008,0032) Acquisition Time	Shown in all IDS5 image windows if present and (0008,0033) not present.
(0008,0033) Image Time	If present, shown in all IDS5 image windows.
(0008,0050) Accession Number	1. Stored in WISE examination data (max 16 characters). 2. Default attribute for examination number in WISE. Used for connecting the image to RIS entities.

DICOM Attribute	Comment
(0008,0060) Modality	1. Stored in WISE series data (max 32 characters). 2. Stored in WISE exam data (max 16 characters). 3. Defines modality for modality specific settings in IDS5 (e.g. information in images and selecting default print partition).
(0008,0080) Institution Name	Stored in WISE examination data (max 64 characters).
(0008,0090) Referring Physician's Name	Stored in WISE request data (max 64 characters).
(0008,1010) Station Name	1. Stored in WISE series data (max 64 characters). 2. Stored in WISE exam data (max 32 characters).
(0008,1030) Study Description	Stored in WISE examination data (max 64 characters).
(0008,1050) Performing Physician's Name	Stored in WISE examination data (max 32 characters).
(0008,1140) Referenced Image Sequence	Used by WISE in default method for locating scanograms.
(0008,1155) Referenced SOP Instance UID	Used by WISE in default method for locating scanograms.
(0010,0010) Patient Name	Stored in WISE patient data if value not found in RIS (max 64 characters).
(0010,0020) Patient ID	1. Must be set. If not, (0010,0010) Patient Name is used as Patient ID in WISE. If both (0010,0020) Patient ID and (0010,0010) Patient Name are empty, the request number is used as Patient ID in WISE. 2. Stored in WISE patient data if value not found in RIS (max 64 characters). 3. Used as request number in WISE if attribute for request number (default: (0020,0010) Study ID) is empty.
(0010,0030) Patient's Birth Date	Stored in WISE patient data if value not found in RIS.
(0010,0040) Patient's Sex	Stored in WISE patient data if value not found in RIS.
(0018,0010) Contrast/Bolus Agent	Shown in IDS5 image window for all CT images
(0018,0015) Body Part Examined	Stored in WISE examination data (max 32 characters).
(0018,0020) Scanning Sequence	Shown in IDS5 image window for all MR images if (0018,0024) not present.
(0018,0024) Sequence Name	If present, shown in IDS5 image window for all MR images
(0018,0050) Slice Thickness	Shown in IDS5 image window for all CT and MR images
(0018,0060) KVP	Shown in IDS5 image window for all CT images
(0018,0080) Repetition Time	Shown in IDS5 image window for all MR images
(0018,0081) Echo Time	Shown in IDS5 image window for all MR images

DICOM Attribute	Comment
(0018,0083) Number of Averages	Shown in IDS5 image window for all MR images
(0018,1041) Contrast/Bolus Volume	Shown in IDS5 image window for all CT and MR images
(0018,1100) Reconstruction Diameter	Shown in IDS5 image window for all CT and MR images
(0018,1120) Gantry/Detector Tilt	Shown in IDS5 image window for all CT images
(0018,1150) Exposure Time	Shown in IDS5 image window for all CT images
(0018,1151) X-ray Tube Current	Shown in IDS5 image window for all CT images
(0018,1164) Imager Pixel Spacing	Used for calibrating the image in IDS5.
(0018,1210) Convolution Kernel	Shown in IDS5 image window for all CT images
(0018,1602) Shutter Left Vertical Edge	Is used for IDS5 cropping and IDS7 display shutters.
(0018,1604) Shutter Right Vertical Edge	Is used for IDS5 cropping and IDS7 display shutters.
(0018,1606) Shutter Upper Horizontal Edge	Is used for IDS5 cropping and IDS7 display shutters.
(0018,1608) Shutter Lower Horizontal Edge	Is used for IDS5 cropping and IDS7 display shutters.
(0018,1610) Center of Circular Shutter	If present and (0018,1602) - (0018,1608) not present, defines an IDS5 square cropping.
(0018,1612) Radius of Circular Shutter	If present and (0018,1602) - (0018,1608) not present, defines an IDS5 square cropping.
(0018,5100) Patient Position	Shown in IDS5 image window for all CT and MR images
(0020,000D) Study Instance UID	Stored in WISE examination data (max 64 characters).
(0020,000E) Series Instance UID	1. Stored in WISE series data (max 64 characters). 2. Is used for non-default method for identifying scanogram images if " `-s u` " option is used with `w_store`. 3. By default, must be equal for all images within a stack.
(0020,0010) Study ID	1. Stored in WISE examination data (max 16 characters). 2. Default attribute for request number in WISE. Used for connecting the image to RIS entities.
(0020,0011) Series Number	1. Stored in WISE series data 2. Is used for non-default method for identifying scanogram images if " `-s s` " option is used with `w_store`.

DICOM Attribute	Comment
(0020,0013) Instance (Image) Number	1. Stored in WISE image data 2. Is used for non-default method for identifying scanogram images if " `-S I` " option is used with `w_store`. 3. Shown in IDS5 image window for all CT and MR images
(0020,0020) Patient Orientation	Always shown in IDS5 image windows for showing anatomical orientation of the image (anterior, posterior, right, left, head, foot). If not present, this information is calculated from tags (0020,0032) and (0020,0037).
(0020,0032) Image Position (Patient)	Important attribute for showing location of images in scanograms in IDS5. Needs to be present in both the stack and in the scanogram. See also (0020,0037) and (0028,0030). IDS7 does not show scanograms for images not having this tag, while IDS5 in this case shows the scanograms, when available, without indicating the position of the slice.
(0020,0037) Image Orientation (Patient)	Important attribute for showing location of images in scanograms in IDS5. Needs to be present in both the stack and in the scanogram. See also (0020,0032) and (0028,0030).
(0020,0052) Frame of Reference UID	Is used for non-default method for identifying scanogram images if " `-S A` " option is used with `w_store`.
(0028,0002) Samples per Pixel	If not set, 1 is assumed in IDS5.
(0028,0004) Photometric Interpretation	MONOCHROME1, MONOCHROME2, PALETTE_COLOR, RGB, YBR_FULL_422 and YBR_FULL are supported by IDS5. If this attribute is not set, MONOCHROME2 is used by IDS5.
(0028,0006) Planar Configuration	If not set, 000 is assumed by IDS5.
(0028,0008) Number of Frames	If not set, 1 is assumed by IDS5.
(0028,0010) Rows	Must be set to be viewable in IDS5.
(0028,0011) Columns	Must be set to be viewable in IDS5

DICOM Attribute	Comment
(0028,0030) Pixel Spacing	1. Used for calibrating the image in IDS5. If empty (0018,1164) is used. 2. Important attribute for showing location of images in scanograms in IDS5. Needs to be present in both the stack and in the scanogram. See also (0020,0032) and (0020,0037). 3. An image with non-square pixels can be transformed to an image with square pixels during image import. 4. IDS5 shows images with non-square pixels as if the pixels where square, but measurements correctly compensate for non-square pixels.
(0028,0034) Pixel Aspect Ratio	1. Used for calibrating the image in IDS5 if (0028,0030) and (0018,1164) are not set. 2. IDS5 shows images with non-square pixels as if the pixels where square, but measurements correctly compensate for non-square pixels.
(0028,0100) Bits Allocated	Must be set to be viewable in IDS5
(0028,0101) Bits Stored	Must be set and less than (0028,0100) Bits Allocated to be viewable in IDS5.
(0028,0102) High Bit	1. If not set, (Bit Stored)-1 is used by IDS5. 2. If set, must be between greater than 0 and less than or equal to Bits Allocated. If not, (Bits Stored)-1 is used by IDS5.
(0028,0103) Pixel Representation	If not set, 0000H (unsigned integer) is assumed by IDS5.
(0028,1050) Window Center	If not set, the default in IDS is half the bit depth.
(0028,1051) Window Width	If not set, the default in IDS5 is the bit depth.
(0028,1052) Rescale Intercept	Is used for calculating Hounsfield units of CT images in IDS5.
(0028,1053) Rescale Slope	Is used for calculating Hounsfield units of CT images in IDS5.
(0028,1056) VOI LUT Function	Is used to interpret (0028,1050) Window Center and (0028,1051) Window Width linearly or non-linearly. If not set, IDS5 will interpret (0028,1050) Window Center and (0028,1051) Window Width linearly.
(0028,3000) Modality LUT Sequence	The first LUT in a sequence is used by IDS5, the rest is ignored.
(0028,3002) LUT Descriptor	Must be set if (0028,3000) Modality LUT Sequence is used.
(0028,3006) LUT Data	Must be set if (0028,3000) Modality LUT Sequence is used.

DICOM Attribute	Comment
(0040,0244) Performed Procedure Step Start Date	Stored in WISE series data
(0040,0245) Performed Procedure Step Start TimeAppendix B	Stored in WISE series data
(0040,0254) Performed Procedure Step Description	Stored in WISE examination data, comments field (max 512 characters).
(0040, 0275) Request Attribute Sequence >(0040,0009) Scheduled Procedure Step Id >(0040,1001) Requested Procedure Id	Stored in WISE series data
(7FE0,0010) Pixel Data	Must be set.

B Key List for Q/R C-FIND-RQ

These tables contain the DICOM keys that are supported by the Q/R SCP AE in C-FIND requests. The three columns under Type correspond to the different Q/R information models: **Pat** = Patient Root, **Study** = Study Root and **P/S O** = Patient/Study Only. The contents of the Type columns specify the key type, where **M** = supported for matching and as return key, **R** = supported as return key only, not for matching. A minus sign indicates that the key is not supported for the specific level and information model. An "X" in the UNIX and Win columns indicates if the key is supported on WISE (UNIX) and WISE (Win) respectively.

Table B.1 PATIENT Level

Key	Tag	Type		Unix	Win	Comment
		Pat	P/S O			
Patient's Name	(0010,0010)	M	M	X	X	Case insensitive matching
Patient ID	(0010,0020)	M	M	X	X	
Patient's Birth Date	(0010,0030)	M	M	X	X	
Patient's Sex	(0010,0040)	R	R	X	X	

Table B.2 STUDY Level

Key	Tag	Type			Unix	Win	Comment
		Pat	Study	P/S O			
Study Date	(0008,0020)	M	M	M	X	X	Range matching is supported
Study Time	(0008,0030)	M	M	M	X	X	Range matching is supported
Accession Number	(0008,0050)	M	M	M	X	X	
Modalities in Study	(0008,0061)	M	M	M	X	X	
Referring Physician's Name	(0008,0090)	M	M	M	X	X	Case sensitive matching
Study Description	(0008,1030)	M	M	M	X	X	
Patient's Name	(0010,0010)	-	M	-	X	X	Case insensitive matching
Patient ID	(0010,0020)	-	M	-	X	X	
Patient's Birth Date	(0010,0030)	-	M	-	X	X	
Patient's Sex	(0010,0040)	-	R	-	X	X	
Study ID	(0020,0010)	M	M	M	X	X	
Study Instance UID	(0020,000D)	M	M	M	X	X	
Number of Study Related Series	(0020,1206)	R	R	R	X	X	
Number of Study Related Instances	(0020,1208)	R	R	R	X	X	

Table B.3 SERIES Level

Key	Tag	Type		Unix	Win	Comment
		Pat	Study			
Modality	(0008,0060)	M	M	X	X	
Series Description	(0008,103E)	R	R	-	X	
Body Part Examined	(0018,0015)	M	M	X	X	
Series Number	(0020,0011)	M	M	X	X	
Series Instance UID	(0020,000E)	M	M	X	X	
Number of Series Related Instances	(0020,1209)	R	R	X	X	
Request Attribute Sequence	(0040,0275)					
>Request Procedure ID	(0040,1001)	M	M	X	X	
>Scheduled Procedure Step ID	(0040,0009)	M	M	X	X	
Performed Procedure Step Start Date	(0040,0244)	M	M	X	X	
Performed Procedure Step Start Time	(0040,0245)	M	M	X	X	

Table B.4 INSTANCE Level

Key	Tag	Type		Unix	Win	Comment
		Pat	Study			
SOP Class UID	(0008,0016)	M	M	X	X	
SOP Instance UID	(0008,0018)	M	M	X	X	
Content Date	(0008,0023)	R	R	X	X	
Content Time	(0008,0033)	R	R	X	X	
Instance Number	(0020,0013)	M	M	X	X	
Referenced Series Sequence	(0008,1115)					
>Series Instance UID	(0008,1115)	R	R	X	X	For presentation states
>Referenced Image Sequence	(0008,1140)					
>>Referenced SOP Class UID	(0008,1150)	R	R	X	X	For presentation states
>>Reference SOP Instance UID	(0008,1155)	R	R	X	X	For presentation states
Number of Frames	(0028,0008)	R	R	X	X	For images
Rows	(0028,0010)	R	R	X	X	For images
Columns	(0028,0011)	R	R	X	X	For images
Bits Allocated	(0028,0100)	R	R	X	X	For images
Observation DateTime	(0040,A032)	R	R	-	X	For key object selection documents
Concept Name Code Sequence	(0040,A043)					
>Code Value	(0008,0100)	M	M	X	X	
>Code Scheme Designator	(0008,0102)	M	M	X	X	
>Coding Scheme Version	(0008,0103)	R	R	X	X	
>Code Meaning	(0008,0104)	R	R	X	X	
Referenced Request Sequence	(0040,A370)					
>Accession Number	(0008,0050)	R	R	X	X	
>Study Instance UID	(0020,000D)	R	R	X	X	
>Requested Procedure Code Sequence	(0032,1064)					
>>Code Value	(0008,0100)	R	R	X	X	
>>Code Scheme Designator	(0008,0102)	R	R	X	X	

Key	Tag	Type		Unix	Win	Comment
		Pat	Study			
>>Coding Scheme Version	(0008,0103)	R	R	X	X	
>>Code Meaning	(0008,0104)	R	R	X	X	
>Requested Procedure ID	(0040,1001)	R	R	X	X	
Content Template Sequence	(0040,A504)					
>Template Identifier	(0040,DB00)	R	R	-	X	For structured reports
Content Label	(0070,0080)	R	R	X	X	For presentation states
Content Description	(0070,0081)	R	R	X	X	For presentation states
Presentation Creation Date	(0070,0082)	R	R	X	X	For presentation states
Presentation Creation Time	(0070,0083)	R	R	X	X	For presentation states
Presentation Creator's Name	(0070,0084)	R	R	X	X	For presentation states

C Sectra Private Attributes

If configured so, the Store SCU AE can include some Private Attributes in images exported from it. This table documents these attributes.

Tag	Name	VR	VM	Description
(0009,00xx)	Private creator code	LO	1	Value: SECTRA_Ident_01
(0009,xx01)	Request number	LO	1	Unique id of request for this image
(0009,xx02)	Examination number	LO	1	Unique id of examination for this image
(0009,xx04)	Series ID	LO	1	Series identifier
(0009,xx05)	Series Order	LO	1	Order within exam
(0009,xx06)	File Name	LO	1	File name
(0009,xx07)	Image Data ID	LO	1	Image identifier
(0009,xx08)	Referring unit	LO	1	Referring physician's institution or clinic
(0009,xx09)	License category	LO	1	License category of imported image
(0009,xx0A)	Teaching file keywords	LT	1	Teaching file keywords for the examination
(0009,xx0B)	Examination comments	LT	1	Comments for the examination
(0009,xx0C)	Teaching file user ID	LO	1	Internal ID of the user setting teaching file keywords
(0029,00yy)	Private creator code	LO	1	Value: SECTRA_ImageInfo_01
(0029,yy01)	Image info	OB	1	Image settings made on an IDS workstation
(0029,yy02)	Marking	CS	1	Marking. Possible value: KEY.
(0029,yy03)	No decompression	LO	1	Indicates no decompression
(0029,yy04)	Image info new	OB	1	Image settings, new version
(0029,yy05)	Original pixel padding value	US or SS	1	Orig. pixel padding value if changed by import
(0089,00zz)	Private creator code	LO	1	Value: SECTRA_IconImageSequence_01
(0089,zz01)	Private icon image sequence	SQ	1	Private icon image data for certain images
(6001,00vv)	Private creator code	LO	1	Value: SECTRA_OverlayInfo_01
(6001,vv01)	Sectra Overlay	LO	1	Indicates which overlay that is the Sectra Overlay
(7FDF,00ww)	Private creator code	LO	1	Value: SECTRA_PixelData_01
(7FDF,ww01)	Scanned document image	OB	1	Pixel data for scanned documents
(7FDF,ww02)	Private icon image pixel data	OB	1	Pixel data for private icon images

D Exported Presentation States

The following topics are included in this appendix:

- WISE
- IDS7

If the user changes an existing default setting the SOP Instance UID of the associated presentation state will be changed. The old setting will not be saved.

Please note that Presentation States that has been imported into WISE will be exported in a transparent way.

D.1 WISE

If the user makes changes in the default image settings and/or annotations these settings and annotations can be exported as DICOM Standard Grayscale Presentation States if the Storage SCP supports this.

The presentation states modules contain the following information generated from IDS5 settings and annotations.

Module	IDS5 correspondence	Note
Presentation State	-	Label: "IDS5 DEFAULT" Description: "IDS5 Default Setting"
Mask	-	Not used.
Display Shutter	Cropping.	Always RECTANGULAR.
Bitmap Display Shutter	-	Not used.
Overlay Plane	-	Not used.
Overlay/Curve Activation	-	All 60xx overlays are rendered in graphic layer 0. 50xx curves are not displayed.
Displayed Area	A combination of view port, zoom factor, zoom to fit, true size	The presentation size mode can be one of "TRUE SIZE", "SCALE TO FIT" or "MAGNIFY" depending on the IDS5 settings.
Graphic Annotation	All overlay graphics and measurements.	We always use annotation units "PIXEL", i.e. image relative coordinates.
Spatial Transformation	Rotation/flip.	
Graphic Layer	-	Only one single layer (0).
Modality LUT	-	Copied from original image.

Module	IDS5 correspondence	Note
Softcopy VOI LUT	Window width/center setting or currently selected LUT.	If the user has selected a true lookup table from the original image, this table is copied from the original image. Otherwise the current window width/center is used.
Softcopy Presentation LUT	-	Normally "IDENTITY", but in some cases it could also be "INVERSE".

D.2 IDS7

If the user makes changes to annotations or image orientation, these can be exported as DICOM Standard Grayscale Presentation States during export to DICOM Media.

The presentation states modules contain the following information generated from IDS7 settings and annotations.

Module	IDS7 correspondence	Note
Presentation State	-	Label: "SECTRA DEFAULT"
Mask	-	Not used.
Display Shutter	Display shutter.	Only RECTANGULAR is supported by IDS7.
Bitmap Display Shutter	-	Not used.
Overlay Plane	All overlay graphics and measurements.	
Overlay/Curve Activation	-	Not used.
Displayed Area	-	The presentation size mode is always "SCALE TO FIT".
Graphic Annotation	-	Not used.
Spatial Transformation	Rotation/flip.	
Graphic Layer	-	Only one single layer (0).
Modality LUT	-	Copied from original image.
Softcopy VOI LUT	-	Copied from original image.
Softcopy Presentation LUT	-	Copied from original image.

E Presentation State Display

The following topics are included in this appendix:

E.1 IDS5

In IDS5, presentation states are translated to IDS5 parameters and displayed, with some limitations as described in the rest of this section. Any presentation state information that is not handled fully by IDS5, causes a warning icon to be displayed over the image.

E.1.1 Presentation State Module (C.11.10)

Presentation Label	(0070,0080)	Used to select PR and presented to user to aid in selection
Referenced Series Sequence	(0008,1115)	Used to link PR with image
>Series Instance UID	(0020,000E)	Used to link PR with image
>Referenced Image Sequence	(0008,1140)	Used to link PR with image
>>Referenced Frame Number	(0008,1160)	Used to link PR with image
Presentation Creation Date	(0070,0082)	Presented to user to aid in selection
Presentation Creation Time	(0070,0083)	Presented to user to aid in selection

E.1.2 Mask Module (C.7.6.10)

Not supported in IDS5.

Mask Subtraction Sequence	0028, 6100	In IDS5 a warning is displayed if element is present

E.1.3 Display Shutter Module (C.7.6.11), Bitmap Display Shutter (C.7.6.15)

For IDS5, Bitmap shutters are not supported. Rectangular shutters are implemented as cropping in IDS5.

Shutter Shape	(0018,1600)	Only RECTANGULAR is supported.

Shutter Left Vertical Edge	(0018,1602)	Used to define shutter shape.
Shutter Right Vertical Edge	(0018,1604)	Used to define shutter shape.
Shutter Upper Horizontal Edge	(0018,1606)	Used to define shutter shape.
Shutter Lower Horizontal Edge	(0018,1608)	Used to define shutter shape.

E.1.4 Overlay Plane (C.9.2)

Only bitmap overlays (no curves) are supported.

Overlay Rows	(60xx,0010)	Defines overlay size
Overlay Columns	(60xx,0011)	
Overlay Type	(60xx,0040)	Only type “G” overlays supported
Overlay Origin	(60xx,0050)	
Overlay Bits Allocated	(60xx,0100)	
Overlay Bit Position	(60xx,0102)	
Overlay data	(60xx,3000)	

E.1.5 Overlay/Curve Activation (C.11.7)

Not supported; overlay display is controlled by user (normally “on”).

Overlay Activation Layer	60xx,1001	In IDS5 a warning is displayed if present

E.1.6 Displayed Area (C.10.4)

Fully supported; implemented as combination of viewport, zoom factor, zoom to fit and zoom to true size in IDS5.

Displayed Area Selection Sequence	0070,005A	Used to select displayed area item
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Instance Sequence	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
>Presentation Pixel Spacing	(0070,0101)	
>Presentation Pixel Aspect Ratio	(0070,0102)	Only 1:1-aspect pixels are supported
>Displayed Area Top Left Hand Corner	(0070,0052)	
>Displayed Area Bottom Right Hand Corner	(0070,0053)	
>Presentation Size Mode	(0070,0100)	
>Presentation Pixel Magnification Ratio	(0070,0103)	

E.1.7 Graphic Annotation (C.10.5)

Only image relative coordinates are supported (unit type “PIXEL”). Filled graphics are not supported. ELLIPSE graphics must have their axes aligned with the coordinate system. Graphic type INTERPOLATED are not supported.

Graphic Annotation Sequence	(0070,0001)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	0008,1160)	
>Graphic Layer	(0070,0002)	Warning displayed if present.
>Text Object Sequence	(0070,0008)	
>>Bounding Box Annotation Units	(0080,0003)	Only PIXEL units supported
>>Anchor Point Annotation Units	(0070,0004)	Only PIXEL units supported
>>Unformatted Text Value	(0070,0006)	
>>Bounding Box Top Left Hand Corner	(0070,0010)	
>>Bounding Box Bottom Right Hand Corner	(0070,0011)	
>>Bounding Box Text Horizontal Justification	(0070,0012)	
>>Anchor Point	(0070,0014)	
>>Anchor Point Visibility	(0070,0015)	
>Graphic Object Sequence	(0070,0009)	
>>Graphic Annotation Units	(0070,0005)	Only PIXEL units supported
>>Number of Graphic Points	(0070,0021)	
>>Graphic Data	(0070,0022)	
>>Graphic Type	(0070,0023)	Type INTERPOLATED is not supported. In IDS5 ELLIPSE objects must have axes aligned with pixel grid.
>>Graphic Filled	(0070,0024)	Value “Y” (filled graphics) not supported

E.1.8 Spatial Transformation (C.10.6)

Image Rotation	(0070,0042)	
Image Horizontal Flip	(0070,0041)	

E.1.9 Graphic Layer (C.10.7)

Not supported; overlays from all layers are displayed in the same manner.

Graphic Layer Sequence	0070,0060	In IDS5 a warning is displayed if element is present

E.1.10 Modality LUT (C.11.1)

Modality LUT Sequence	(0028,3000)	
>LUT Descriptor	(0028,3002)	
>LUT Data	(0028,3006)	
Modality LUT Rescale Intercept	(0028,1052)	
Modality LUT Rescale Slope	(0028,1053)	

E.1.11 Softcopy VOI LUT (C.11.8)

Softcopy VOI LUT Sequence	(0028,3110)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
>VOI LUT Sequence	(0028,3010)	
>>LUT Descriptor	(0028,3002)	
>>LUT Data	(0028,3006)	
>Window Center	(0028,1050)	
>Window Width	(0028,1051)	
>VOI LUT Function	(0028,1056)	

E.1.12 Softcopy Presentation LUT (C.11.6)

Presentation LUT Sequence	(2050,0010)	
>LUT Descriptor	(0028,3002)	
>LUT Data	(0028,3006)	
Presentation LUT Shape	(2050,0020)	

E.2 IDS7

IDS7 has the ability to show graphical objects, spatial transformations, display shutters and LUT information with limitations described in the rest of this section.

E.2.1 Presentation State Module (C.11.10)

IDS7 displays annotations from all available presentation states and can only toggle this display on and off all together. The other settings are applied using one selected presentation state at a time.

Presentation Label	(0070,0080)	Presented to user to aid in selection
Referenced Series Sequence	(0008,1115)	Used to link PR with image
>Referenced Image Sequence	(0008,1140)	Used to link PR with image
>>Referenced Frame Number	(0008,1160)	Used to link PR with image

E.2.2 Mask Module (C.7.6.10)

Not supported in IDS7.

E.2.3 Display Shutter Module (C.7.6.11), Bitmap Display Shutter (C.7.6.15)

Bitmap shutters are not supported by IDS7.

Shutter Shape	(0018,1600)	Only RECTANGULAR is supported.
Shutter Left Vertical Edge	(0018,1602)	Used to define shutter shape.
Shutter Right Vertical Edge	(0018,1604)	Used to define shutter shape.
Shutter Upper Horizontal Edge	(0018,1606)	Used to define shutter shape.
Shutter Lower Horizontal Edge	(0018,1608)	Used to define shutter shape.

E.2.4 Overlay Plane (C.9.2)

Only bitmap overlays (no curves) are supported.

Overlay Rows	(60xx,0010)	Defines overlay size
Overlay Columns	(60xx,0011)	
Overlay Type	(60xx,0040)	Graphics “G” and ROI "R" overlays are supported
Overlay Origin	(60xx,0050)	
Overlay Bits Allocated	(60xx,0100)	
Overlay Bit Position	(60xx,0102)	
Overlay data	(60xx,3000)	

E.2.5 Overlay/Curve Activation (C.11.7)

Not supported; overlay display is controlled by user (normally “on”).

Overlay Activation Layer	60xx,1001	In IDS7 a warning is displayed if present

E.2.6 Displayed Area (C.10.4)

In IDS7, this module is used for calculation of coordinates that is referencing to a displayed area. Otherwise the module is ignored.

Displayed Area Selection Sequence	0070,005A	Used to select displayed area item
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Instance Sequence	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
>Presentation Pixel Spacing	(0070,0101)	
>Presentation Pixel Aspect Ratio	(0070,0102)	
>Displayed Area Top Left Hand Corner	(0070,0052)	
>Displayed Area Bottom Right Hand Corner	(0070,0053)	
>Presentation Size Mode	(0070,0100)	
>Presentation Pixel Magnification Ratio	(0070,0103)	

E.2.7 Graphic Annotation (C.10.5)

Filled graphics are not supported. Graphic type INTERPOLATED and filled graphics are not supported.

Graphic Annotation Sequence	(0070,0001)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	0008,1160)	
>Graphic Layer	(0070,0002)	Warning displayed if present.
>Text Object Sequence	(0070,0008)	
>>Bounding Box Annotation Units	(0080,0003)	
>>Anchor Point Annotation Units	(0070,0004)	
>>Unformatted Text Value	(0070,0006)	
>>Bounding Box Top Left Hand Corner	(0070,0010)	
>>Bounding Box Bottom Right Hand Corner	(0070,0011)	
>>Bounding Box Text Horizontal Justification	(0070,0012)	
>>Anchor Point	(0070,0014)	
>>Anchor Point Visibility	(0070,0015)	
>Graphic Object Sequence	(0070,0009)	
>>Graphic Annotation Units	(0070,0005)	

>>Number of Graphic Points	(0070,0021)	
>>Graphic Data	(0070,0022)	
>>Graphic Type	(0070,0023)	Type INTERPOLATED is not supported.
>>Graphic Filled	(0070,0024)	Value "Y" (filled graphics) not supported

E.2.8 Spatial Transformation (C.10.6)

Image Rotation	(0070,0042)	
Image Horizontal Flip	(0070,0041)	

E.2.9 Graphic Layer (C.10.7)

Not supported; overlays from all layers are displayed in the same manner.

Graphic Layer Sequence	0070,0060	In IDS7 a warning is displayed if element is present

E.2.10 Modality LUT (C.11.1)

Modality LUT Sequence	(0028,3000)	
>LUT Descriptor	(0028,3002)	
>LUT Data	(0028,3006)	
Modality LUT Rescale Intercept	(0028,1052)	
Modality LUT Rescale Slope	(0028,1053)	

E.2.11 Softcopy VOI LUT (C.11.8)

Softcopy VOI LUT Sequence	(0028,3110)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
>VOI LUT Sequence	(0028,3010)	
>>LUT Descriptor	(0028,3002)	
>>LUT Data	(0028,3006)	
>Window Center	(0028,1050)	
>Window Width	(0028,1051)	
>VOI LUT Function	(0028,1056)	

E.2.12 Softcopy Presentation LUT (C.11.6)

Presentation LUT Sequence	(2050,0010)	
>LUT Descriptor	(0028,3002)	
>LUT Data	(0028,3006)	
Presentation LUT Shape	(2050,0020)	

F Key List for MWL C-FIND-RQ

This table contains the DICOM keys that are supported by the Modality Worklist SCP AE in C-FIND requests. The contents of the Type columns specify the key type, where **M** = supported for matching and as return key, **R** = supported as return key only, not for matching.

Table F.1 Modality Worklist Information Model Attributes

Key	Tag	Type	Comment
Specific Character Set	(0008,0005)	R	
Scheduled Procedure Step Sequence	(0040,0100)	M	
>Scheduled Station AE Title	(0040,0001)	M	
>Scheduled Procedure Step Start Date	(0040,0002)	M	Range matching is supported
>Scheduled Procedure Step Start Time	(0040,0003)	M	Range matching is supported
>Modality	(0008,0060)	M	
>Scheduled Performing Physician's name	(0040,0006)	M	
>Scheduled Procedure Step Description	(0040,0007)	M	
>Scheduled Station Name	(0040,0010)	M	
>Scheduled Procedure Step ID	(0040,0009)	M	
Requested Procedure ID	(0040,1001)	M	
Requested Procedure Description	(0032,1060)	R	
Study Instance UID	(0020,000D)	M	
Accession Number	(0008,0050)	M	
Referring Physician's Name	(0008,0090)	M	Case sensitive matching
Patient ID	(0010,0020)	M	
Patient's Name	(0010,0010)	M	Case insensitive matching
Patient's Birth Date	(0010,0030)	M	
Patient's Sex	(0010,0040)	R	

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