

Philips Medical Systems

DICOM

CONFORMANCE STATEMENT



EasyAccess Enterprise R 9.2 (HPUX)
EasyAccess Enterprise Edition R 9.2 (W2K)
EasyAccess Entry R 9.2
EasyAccess Modality R 3.1
EasyVision DX/CL/RG/Home/CL.net R 9.2
EasyCapture F/M R 9.2
EasyVision DX Standalone R 9.2

Document Number XPB 080-030098

02 Sept 2004

© Koninklijke Philips Electronics N.V. 2004
All rights reserved



PHILIPS

Copyright KONINKLIJKE PHILIPS ELECTRONICS N.V. 2004.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without prior written permission from the copyright owner.

Copyright © 2003 SECTRA-Imtec AB. All rights reserved.

Philips PACS Systems are built in partnership with Sectra-Imtec AB, Sweden.

TABLE OF CONTENTS

1. INTRODUCTION	6
1.1. Scope and Field of Application	6
1.2. Intended Audience	6
1.3. Contents and Structure.....	6
1.4. Used Definitions, Terms and Abbreviations	6
1.5. References.....	6
1.6. Important Note to the Reader	7
1.7. General Acronyms and Abbreviations.	8
2. IMPLEMENTATION MODEL	9
2.1. Application Data Flow Diagram	9
2.1.1. EasyVision DX/CL/RG/Home/CL.NET Application Flow Diagram	9
2.1.2. EasyCapture F/M Application Flow Diagram.....	10
2.1.3. EasyVision DX Standalone Application Flow Diagram	11
2.1.4. EasyAccess Enterprise (HPUX / W2K) Application Flow Diagram	12
2.1.5. EasyAccess Entry Application Flow Diagram.....	13
2.1.6. EasyAccess Modality Application Flow Diagram	15
2.2. Functional Definitions of AE's.....	16
2.2.1. General – Storage SOP Classes	16
2.2.2. EasyVision - SOP Classes and Transfer syntaxes supported.....	17
2.2.3. EasyAccess Enterprise(HPUX) – SOP Classes and Transfer syntaxes supported.....	18
2.2.4. EasyAccess Entry/Enterprise(W2K) – Summary of SOP classes supported	19
2.2.5. EasyVision – AE descriptions	20
2.2.6. EasyAccess Entry / Enterprise(HPUX/W2K) – AE descriptions	21
2.2.7. EasyAccess Entry - AE descriptions	22
2.3. Sequencing of Real-World Activities Overview	24
2.3.1. EasyVision	24
2.3.2. EasyAccess Enterprise (HPUX/W2K)	24
2.3.3. EasyAccess Entry.....	24
3. AE SPECIFICATIONS	25
3.1. EasyVision AE Specification.....	25
3.1.1. Storage SCP AE Specifications (EasyVision)	25
3.1.1.1. Association Establishment Policies.....	25
3.1.1.2. Association Initiation Policy	25
3.1.1.3. Association Acceptance Policy	25
3.1.2. Q/R-MWL SCU AE Specification (EasyVision)	27
3.1.2.1. Association Establishment Policies.....	27
3.1.2.2. Association Initiation Policy	29
3.1.2.3. Association Acceptance Policy	30
3.1.3. Print SCU AE Specification (EasyVision).....	31
3.1.3.1. Association Establishment Policies.....	31
3.1.3.2. Association Initiation Policy	31
3.1.3.3. Association Acceptance Policy	34
3.2. EasyAccess Enterprise(HPUX/W2K) AE Specifications.....	34
3.2.1. Storage SCU AE Specification (EasyAccess Enterprise(HPUX/W2K)).....	34
3.2.1.1. Association Establishment Policies.....	34
3.2.1.2. Association Initiation Policy	34
3.2.1.3. Association Acceptance Policy	36
3.2.2. Storage SCP AE Specification (EasyAccess Enterprise(HPUX/W2K)).....	36
3.2.2.1. Association Establishment Policies.....	36
3.2.2.2. Association Initiation Policy	37
3.2.2.3. Association Acceptance Policy	37

3.2.3.	Q/R SCU AE Specification (EasyAccess Enterprise(HPUX/W2K)).....	40
3.2.3.1.	Association Establishment Policies.....	40
3.2.3.2.	Association Initiation Policy.....	40
3.2.3.3.	Association Acceptance Policy.....	41
3.2.4.	Q/R SCP AE Specification (EasyAccess Enterprise(HPUX/W2K)).....	41
3.2.4.1.	Association Establishment Policies.....	41
3.2.4.2.	Association Initiation Policy.....	41
3.2.4.3.	Association Acceptance Policy.....	41
3.2.5.	Notif SCU AE Specification (EasyAccess Enterprise(HPUX/W2K)).....	43
3.2.5.1.	Association Establishment Policies.....	43
3.2.5.2.	Association Initiation Policy.....	45
3.2.5.3.	Association Acceptance Policy.....	45
3.3.	EasyAccess Entry AE Specifications.....	45
3.3.1.	Storage SCU AE Specification (EasyAccess Entry).....	45
3.3.1.1.	Association Establishment Policies.....	45
3.3.1.2.	Association Initiation Policy.....	46
3.3.1.3.	Association Acceptance Policy.....	47
3.3.2.	Storage SCP AE Specification (EasyAccess Entry).....	47
3.3.2.1.	Association Establishment Policies.....	47
3.3.2.2.	Association Initiation Policy.....	47
3.3.2.3.	Association Acceptance Policy.....	47
3.3.3.	Q/R SCU AE Specification (EasyAccess Entry).....	51
3.3.3.1.	Association Establishment Policies.....	51
3.3.3.2.	Association Initiation Policy.....	51
3.3.3.3.	Association Acceptance Policy.....	52
3.3.4.	Q/R SCP AE Specification (EasyAccess Entry).....	52
3.3.4.1.	Association Establishment Policies.....	52
3.3.4.2.	Association Initiation Policy.....	52
3.3.4.3.	Association Acceptance Policy.....	52
3.3.5.	Notif SCU AE Specification (EasyAccess Entry).....	55
3.3.5.1.	Association Establishment Policies.....	55
3.3.5.2.	Association Initiation Policy.....	56
3.3.5.3.	Association Acceptance Policy.....	56
4.	COMMUNICATION PROFILES.....	57
4.1.	Supported Communication Stacks.....	57
4.2.	TCP/IP Stack.....	57
4.2.1.	Physical Media Support.....	57
4.3.	OSI Stack.....	57
4.4.	Point-To-Point Stack.....	57
5.	EXTENSIONS/SPECIALIZATION/PRIVATIZATION.....	58
5.1.	Transfer Syntaxes.....	58
5.2.	Private Attributes.....	58
5.3.	Standard extended SOP Classes.....	58
5.3.1.	Basic Study Content Notification SOP Class.....	58
6.	CONFIGURATION.....	59
6.1.	EasyVision.....	59
6.1.1.	Storage SCP.....	59
6.1.2.	Q/R-MWL SCU.....	59
6.1.3.	Print SCU.....	59
6.1.4.	DICOM Media.....	59
6.2.	EasyAccess Enterprise(HPUX/W2K).....	60
6.2.1.	Storage SCU.....	60
6.2.2.	Storage SCP.....	60

6.2.3. Q/R SCU	60
6.2.4. Q/R SCP	60
6.2.5. Notif SCU	61
6.3. EasyAccess Entry	61
6.3.1. Storage SCU	61
6.3.2. Storage SCP	61
6.3.3. Q/R SCU	61
6.3.4. Q/R SCP	62
6.3.5. Notif SCU	62
7. SUPPORT OF EXTENDED CHARACTER SETS	63
7.1. Supported Extended Character Sets	63

1. INTRODUCTION

This chapter provides general information about the purpose, scope and contents of this Conformance Statement.

1.1. Scope and Field of Application

The scope of this DICOM Conformance Statement is to facilitate data exchange with equipment of Philips Medical Systems. This document specifies the compliance to the DICOM standard (formally called the NEMA PS 3.X standards). It contains a short description of the applications involved and provides technical information about the data exchange capabilities of the equipment. The main elements describing these capabilities are: the supported DICOM Service Object Pair (SOP) Classes, Roles, Information Object Definitions (IOD) and Transfer Syntaxes.

The field of application is the integration of the Philips Medical Systems equipment into an environment of medical devices. This Conformance Statement should be read in conjunction with the DICOM standard and its addenda [DICOM].

1.2. Intended Audience

This Conformance Statement is intended for:

- (potential) customers
- system integrators of medical equipment
- marketing staff interested in system functionality
- software designers implementing DICOM interfaces

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

1.3. Contents and Structure

The DICOM Conformance Statement is contained in chapter 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2. – 2003.

1.4. Used Definitions, Terms and Abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3 and PS 3.4 – 2003.

The word Philips in this document refers to Philips Medical Systems.

1.5. References

- [DICOM] The Digital Imaging and Communications in Medicine (DICOM) standard (NEMA PS 3.X):
National Electrical Manufacturers Association (NEMA)
Publication Sales 1300 N. 17th Street, Suite 1847
Rosslyn, Va. 22209, United States of America

1.6. Important Note to the Reader

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

➤ Interoperability

Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a IT environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment.

It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

➤ Validation

Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.

Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

➤ New versions of the DICOM Standard

The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.

The user should ensure that any non-Philips provider linking to Philips equipment, also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

REMARK:

In this Conformance Statement for an EasyAccess system can be read in general:

**EasyAccess Enterprise (HPUX/W2K) and
EasyAccess Entry, EasyAccess Modality, EasyCapture unless otherwise
specified.**

1.7. General Acronyms and Abbreviations.

The following acronyms and abbreviations are used in the document.

➤ ACC	American College of Cardiology
➤ AE	Application Entity
➤ ACR	American College of Radiology
➤ ANSI	American National Standard Institute
➤ API	Application Programming Interface
➤ ASCII	American Standard Code for Information Interchange
➤ DICOM	Digital Imaging and Communication in Medicine
➤ DIMSE	DICOM Message Service Element
➤ ELE	Explicit VR Little Endian
➤ EBE	Explicit VR Big Endian
➤ ILE	Implicit VR Little Endian
➤ IOD	Information Object Definition
➤ MWL	Modality Worklist Management
➤ NEMA	National Electrical Manufacturers Association
➤ PDU	Protocol Data Unit
➤ RIS	Radiology Information System
➤ RWA	Real World Activity
➤ SCU	Service Class User
➤ SOP	Service Object Pair
➤ TCP/IP	Transmission Control Protocol/Internet protocol
➤ UID	Unique Identifier

2. IMPLEMENTATION MODEL

2.1. Application Data Flow Diagram

2.1.1. EasyVision DX/CL/RG/Home/CL.NET Application Flow Diagram

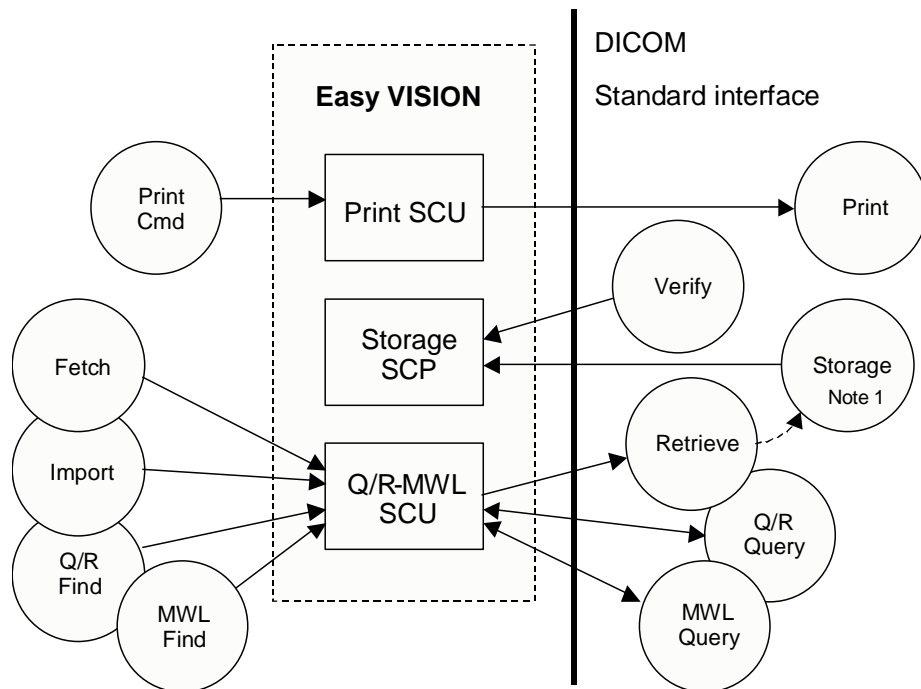


Figure 1. EasyVision DX/CL/RG/Home/CL.NET

Note1: It is also possible to store images to another DICOM Storage SCP then EasyVision

EasyVision DX/CL/RG/Home/CL.NET is a multi-modality viewing station for DICOM images. It provides (among other things) the following features:

- 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 an EasyAccess system.

- EasyVision contains three different Application Entities (AE), Print SCU, Storage SCP and Q/R-MWL SCU. Each AE only has one instance.

2.1.2. EasyCapture F/M Application Flow Diagram

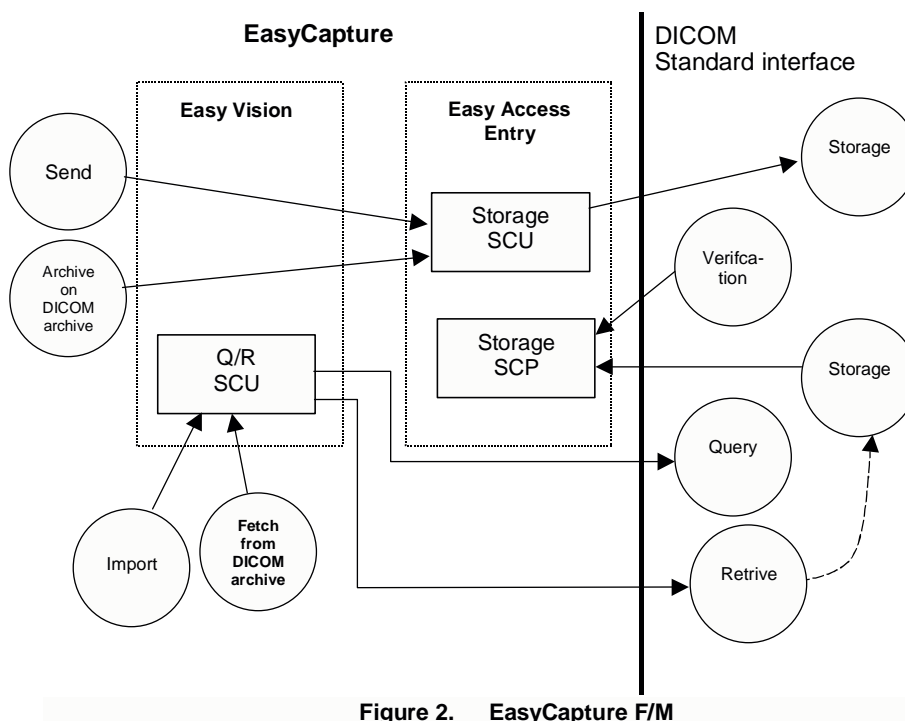


Figure 2. EasyCapture F/M

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

- Reply on communication tests from remote applications.
- 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 an EasyAccess system.
- EasyVision contains three different Application Entities (AE), Storage SCU, Storage SCP and Q/R-MWL SCU.

2.1.3. EasyVision DX Standalone Application Flow Diagram

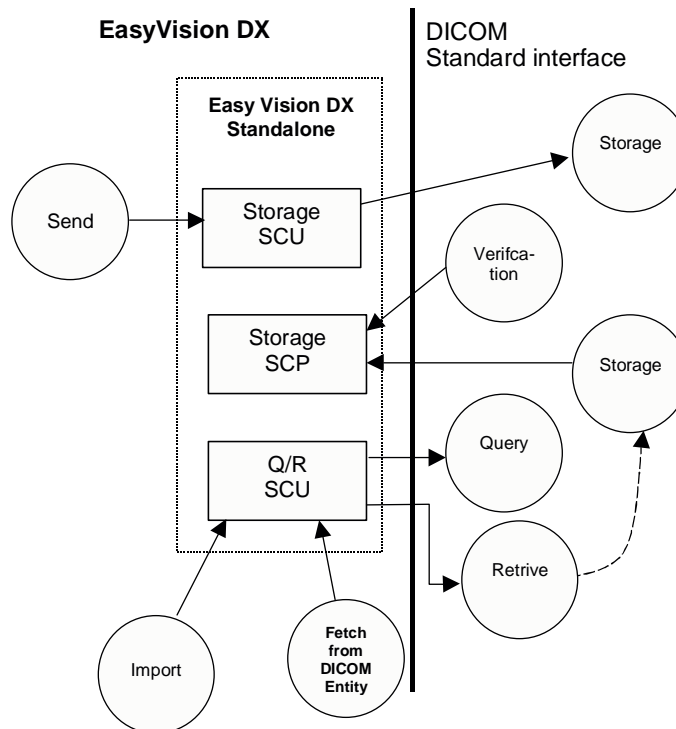


Figure 3. EasyVision DX Standalone

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

- Reply on communication tests from remote applications.
- 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 an EasyAccess system.

EasyVision DX Standalone contains three different Application Entities (AE): Storage SCU, Storage SCP and Q/R-MWL SCU

2.1.4. EasyAccess Enterprise (HPUX / W2K) Application Flow Diagram

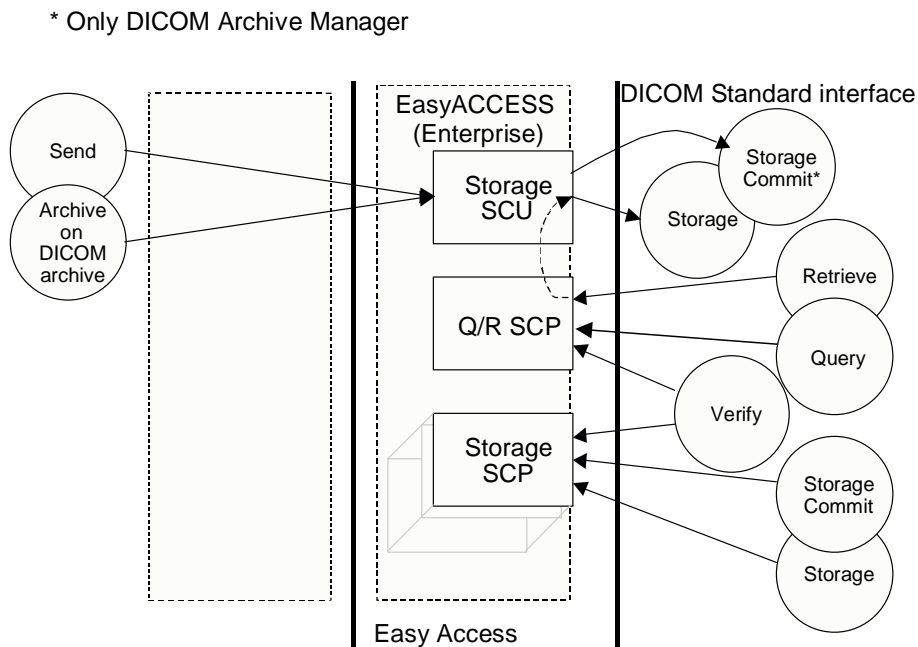


Figure 4. EasyAccess Enterprise

EasyAccess Enterprise (HPUX/W2K) 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 EasyAccess Enterprise (HPUX/W2K) database and retrieve images.
- 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.

EasyAccess Enterprise (HPUX/W2K) contains five different Application Entities (AE): Storage SCU, Q/R SCP, Storage SCP, Q/R SCU and Notif SCU.

Each AE only has one instance except Storage SCP which can have many instances.

2.1.5. EasyAccess Entry Application Flow Diagram

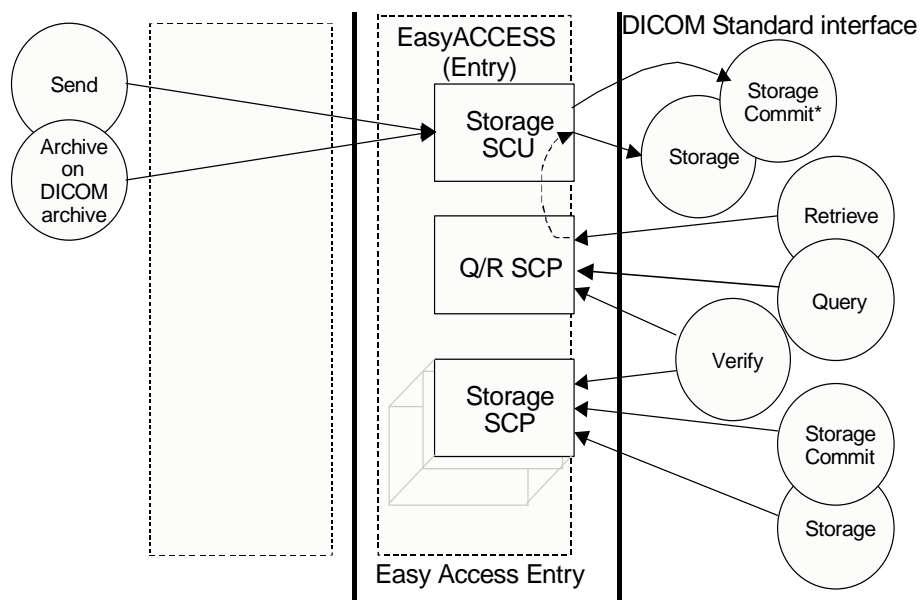


Figure 5. EasyAccess Entry

EasyAccess Entry 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 EasyAccess Entry 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.

EasyAccess Entry contains five different Application Entities (AE): Storage SCU, Q/R SCP, Storage SCP, Q/R SCU and Notif SCU.

Each AE only has one instance except from Storage SCP that can have many instances.



2.1.6. EasyAccess Modality Application Flow Diagram

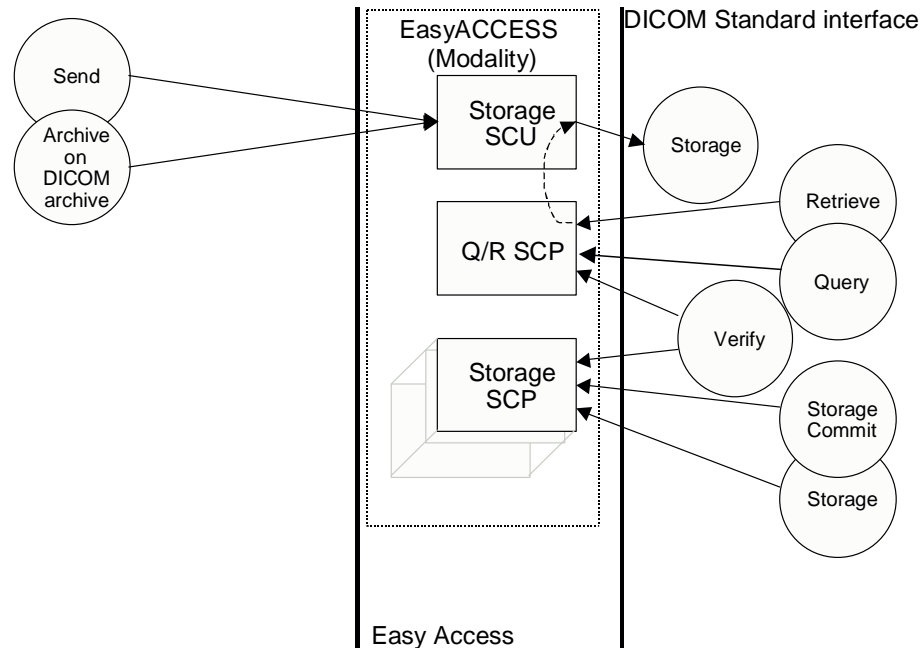


Figure 6. EasyAccess Modality

EasyAccess Modality provides (among other things) the following features:

- It relies 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 EasyAccess Modality 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.

EasyAccess Modality contains three different Application Entities (AE): Storage SCU, Q/R SCP, Storage SCP.

2.2. Functional Definitions of AE's

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 1. List of supported Storage SOP classes

SOP Class Name	SOP Class UID
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
US Multi-Frame Image Storage (Ret.)	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	1.2.840.10008.5.1.4.1.1.8
Stand-alone Curve Storage	1.2.840.10008.5.1.4.1.1.9
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 St.	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
Stand-alone Modality LUT	1.2.840.10008.5.1.4.1.1.10
Stand-alone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
Grayscale Softcopy Pres. State Storage	1.2.840.10008.5.1.4.1.1.11.1
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Angio. Bi-plane Image St. (Ret.)	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
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Micros. Image St.	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
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
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
PET Image Storage	1.2.840.10008.5.1.4.1.1.128
Stand-alone PET Curve Storage	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
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29
Stored Print Storage	1.2.840.10008.5.1.1.27
Private X-Ray Raw Image	1.3.46.670589.2.3.1.1
Private CX Image Storage	1.3.46.670589.2.4.1.1
Private Volume Storage	1.3.46.670589.5.0.1
Private Volume Image Reference	1.3.46.670589.5.0.1.1 (Note 1)
Private 3D Object Storage	1.3.46.670589.5.0.2
Private 3D Object 2 Storage	1.3.46.670589.5.0.2.1
Private Surface Storage	1.3.46.670589.5.0.3
Private Surface 2 Storage	1.3.46.670589.5.0.3.1
Private Composite Object Storage	1.3.46.670589.5.0.4
Private MR Cardio Profile	1.3.46.670589.5.0.7
Private MR Cardio	1.3.46.670589.5.0.8
Private MR Cardio Image Reference	1.3.46.670589.5.0.8.1 (Note 1)
Private CT Synthetic Image St.	1.3.46.670589.5.0.9
Private MR Synthetic Image St.	1.3.46.670589.5.0.10
Private MR Cardio Analysis St.	1.3.46.670589.5.0.11
Private MR Cardio Analysis Data	1.3.46.670589.5.0.11.1 (Note 1)
Private CX Synthetic Image St.	1.3.46.670589.5.0.12
Private Gyroscan MR Spectrum	1.3.46.670589.11.0.0.12.1
Private Gyroscan MR Serie Data	1.3.46.670589.11.0.0.12.2
Private Specialised XA Storage	1.3.46.670589.2.3.1.1
Private Perfusion Image Reference	1.3.46.670589.5.0.13 (Note 2)
Private Perfusion Analysis Data	1.3.46.670589.5.0.14 (Note 2)

Note 1: Supported by EasyAccess Enterprise as SCP only.

Note 2: May be add manually for EasyAccess Entry using DICOM server utility of the EasyAccess tools

2.2.2. EasyVision - SOP Classes and Transfer syntaxes supported

The three following tables (Table 2, 3 and 4) use these abbreviations to identify AE's:

- Storage SCP SP
- Q/R-MWL SCU QU
- Print SCU PU

Table 2. Supported SOP classes as SCU (EasyVision)

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

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

Table 3. Supported SOP classes as SCP (EasyVision)

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 1	See Table 1	Y	-	-

Table 4. Supported transfer syntaxes (EasyVision)

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)		
		SP	QU	PU
Private Compression (Private Syntax)	1.2.752.24.3.7.6	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, Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	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. EasyAccess Enterprise(HPUX) – SOP Classes and Transfer syntaxes supported

The three following tables (Table 5, 6 and 7) use these abbreviations to identify AE's:

- Storage SCU SU
- Storage SCP SP
- Q/R SCU QU
- Q/R SCP QP
- Notif SCU NU

Table 5. Supported SOP classes as SCU (EasyAccess Enterprise(HPUX))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)				
		SU	SP	QU	QP	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 1	See Table 1	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 DICOM Archive Manager

Table 6. Supported SOP classes as SCP (EasyAccess Enterprise (HPUX))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)				
		SU	SP	QU	QP	NU
Verification	1.2.840.10008.1.1	-	Y	-	Y	-
All Storage SOP Classes, see Table 1	See Table 1	-	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	-

Table 7. Supported transfer syntaxes (EasyAccess Enterprise (HPUX))

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)				
		SU	SP	QU	QP	NU
Private Compression (Private Syntax)	1.2.752.24.3.7.6	-	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	-	-	-
JPEG Lossless, Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	-	Y	-	-	-
Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y	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	-	-	-

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

2.2.4. EasyAccess Entry/Enterprise(W2K) – Summary of SOP classes supported

The three following tables (Table 8, 9, & 10) use these abbreviations to identify AE's:

- Storage SCU SU
- Storage SCP SP
- Q/R SCU QU
- Q/R SCP QP

➤ Notif SCU NU

Table 8. Supported SOP classes as SCU (EasyAccess Entry/Enterprise (W2K))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)				
		SU	SP	QU	QP	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 1	See Table 1	Y	-	-	-	-
Basic Study Content Notification	1.2.840.10008.1.9	-	-	-	-	Y

Table 9. Supported SOP classes as SCP (EasyAccess Entry/Enterprise (W2K))

SOP Class Name	SOP Class UID	Supported for AE Y/- (Yes/No)				
		SU	SP	QU	QP	NU
Verification	1.2.840.10008.1.1	-	Y	-	Y	-
All Storage SOP Classes, see Table 1	See Table 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	-
Storage Commitment Push Model*	1.2.840.10008.1.20.1	-	Y	-	-	-

*Only Implicit VR Little Endian Transfer Syntax is supported

Table 10. Supported Transfer Syntaxes (EasyAccess Entry/Enterprise(W2K))

Transfer Syntax Name	Transfer Syntax UID	Supported for AE Y/- (Yes/No)				
		SU	SP	QU	QP	NU
Private Compression (Private Syntax)	1.2.752.24.3.7.6	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, Hier., First-Order Pred.	1.2.840.10008.1.2.4.70	Y	Y	-	-	-
Implicit VR Little Endian	1.2.840.10008.1.2	Y	Y	Y	Y	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	-	-	-

Note: The Storage Commitment Push Model SOP Class is only supported with Implicit VR Little Endian Transfer Syntax for EasyAccess Entry.

2.2.5. EasyVision – AE descriptions

Storage SCP

Storage SCP is the AE responsible for receiving images. The EasyVision 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 EasyVision is exited, all stored images are removed.
Read more about this functionality in the EasyVision User's Documentation.

Q/R-MWL SCU

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

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

Read more about this functionality in EasyVision Storage SCP above and in the EasyVision User's Documentation.

Print SCU

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

As described in the EasyVision User's Documentation the EasyVision 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).

2.2.6. EasyAccess Entry / Enterprise(HPUX/W2K) – AE descriptions

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 EasyVision or as a result of archiving command when using Archive Manager.

The second situation is described in the EasyVision User's Documentation. When the EasyVision 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 the EasyAccess system, 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.

Storage SCP

Storage SCP is the AE responsible for receiving images. There can be any number of Storage SCP AE's 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.

Q/R SCU

Q/R SCU is used only when the Archive Manager (interface to external DICOM archive) product is used in the PACS. It is invoked when an archive retrieval is

performed. It will search and retrieve requested studies from the external DICOM archive. There is only one Q/R SCU AE.

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 EasyAccess product. The number of Q/R SCP AE's is configurable and may be more than one.

When the Q/R SCP AE receives a query (C-FIND request) it will search in the EasyAccess 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 EasyAccess 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.

Notif SCU

If the EasyAccess 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. A Basic Study Descriptor object is sent, triggered by one of the following events:

- Exam_data ris_state is set to a specific value (Send_on_state)
- An exam is retrieved from the archive (Send_on_exam_retrieved)

2.2.7. EasyAccess Entry - AE descriptions

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 or from an EasyVision.

The second situation is described in the EasyVision User's Documentation. When the EasyVision 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 EasyAccess Entry, 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.

Storage SCP

Storage SCP is the AE responsible for receiving images. There can be any number of Storage SCP AE's 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.

Q/R SCU

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

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 EasyAccess Entry product. The number of Q/R SCP AE's is configurable and may be more than one.

When the Q/R SCP AE receives a query (C-FIND request) it will search in the EasyAccess Entry 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 EasyAccess Entry 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.

Notif SCU

If EasyAccess Entry 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. A Basic Study Descriptor object is sent, triggered by one of the following events:

- Exam_data ris_state is set to a specific value (Send_on_state)
- An exam is retrieved from the archive (Send_on_exam_retrieved)

2.3. Sequencing of Real-World Activities Overview

2.3.1. EasyVision

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

2.3.2. EasyAccess Enterprise (HPUX/W2K)

EasyAccess Enterprise(HPUX/W2K) receives images and then it can be queried through both Q/R and EasyAccess Enterprise(HPUX/W2K) API. Sending images, storage commitment and notification can be performed on images stored.

2.3.3. EasyAccess Entry

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

3. AE SPECIFICATIONS

3.1. EasyVision AE Specification

3.1.1. Storage SCP AE Specifications (EasyVision)

3.1.1.1. Association Establishment Policies

3.1.1.1.1. General

The maximum PDU-length, which a Storage SCP AE will use, is configurable. The default is 28672 bytes (28 kBytes). Only Philips Medical Systems authorized personnel can do configuration. Allowed values are between 4096 bytes (4kBytes) and 131072 Bytes (128 kBytes) including these values.

3.1.1.1.2. Number of Associations

Each Storage SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Only Philips Medical Systems authorized personnel can do configuration.

3.1.1.1.3. 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.

3.1.1.1.4. 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_9_10

3.1.1.2. Association Initiation Policy

The EasyVision Storage SCP will not initiate associations.

3.1.1.3. 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 an EasyAccess server system 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 an EasyAccess database.

3.1.1.3.1. Verification of the Communication

3.1.1.3.1.1. Associated Real-World Activity

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

3.1.1.3.1.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 3 and Table 4. Role is SCP.

3.1.1.3.1.3. SOP Specific Conformance

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

3.1.1.3.1.4. Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

3.1.1.3.1.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 4.

3.1.1.3.2. Transfer of Images from a Remote System to the local storage

3.1.1.3.2.1. Associated Real-World Activity

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

3.1.1.3.2.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 3 and Table 4. Role is SCP.

3.1.1.3.2.3. 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 EasyVision. 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 EasyVision the following points must be noted

Multi-frame images in one dimension can be viewed in EasyVision; 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. EasyVision shows images with non-square pixels as if the pixels were square. It is possible to configure image import so that non-square pixels are transformed to square pixels.

Regarding color images, EasyVision can only view those with (0028,0004), Photometric interpretation, equal to RGB with 24 bits (8 bits per channel) or (0028,0004), Photometric interpretation, equal to PALETTE_COLOR. Images are handled color-by-pixel internally in an EasyAccess system and EasyVision. Under certain circumstances images that are sent color-by-plane to an EasyAccess system/EasyVision can be sent color-by-pixel if fetched from EasyVision/EasyAccess system.

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

3.1.1.3.2.4. Presentation Context Acceptance Criterion

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

3.1.1.3.2.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 4.

3.1.2. Q/R-MWL SCU AE Specification (EasyVision)

3.1.2.1. Association Establishment Policies

3.1.2.1.1. General

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

3.1.2.1.2. 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.

3.1.2.1.3. Asynchronous Nature

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

3.1.2.1.4. 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_9_10



3.1.2.2. Association Initiation Policy

3.1.2.2.1. Real-World Activity – Q/R Find

3.1.2.2.1.1. Associated Real-World Activity

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

3.1.2.2.1.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2 and Table 4. Role is SCU.

3.1.2.2.1.3. 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.

3.1.2.2.2. Real-World Activity – MWL Find

3.1.2.2.2.1. Associated Real-World Activity

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

3.1.2.2.2.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2 and Table 4. Role is SCU.

3.1.2.2.2.3. 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.

Table 11. Matching Keys

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	

3.1.2.2.3. Real-World Activity - Import

3.1.2.2.3.1. 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 an EasyAccess.

3.1.2.2.3.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2 and Table 4. Role is SCU.

3.1.2.2.3.3. SOP-Specific Conformance

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

3.1.2.2.4. Real-World Activity - Fetch

3.1.2.2.4.1. 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 EasyVision workstation for temporary storage.

3.1.2.2.4.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2 and Table 4. Role is SCU.

3.1.2.2.4.3. SOP-Specific Conformance

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

3.1.2.3. Association Acceptance Policy

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

3.1.3. Print SCU AE Specification (EasyVision)

3.1.3.1. Association Establishment Policies

3.1.3.1.1. General

The maximum PDU size that the Print SCU AE will use is 16384 Bytes (16 kBytes).

3.1.3.1.2. 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.

3.1.3.1.3. Asynchronous Nature

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

3.1.3.1.4. 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_9_10

3.1.3.2. Association Initiation Policy

3.1.3.2.1. Real-World Activity - Print Command

3.1.3.2.1.1. Associated Real-World Activity

As described in the EasyVision User's Documentation the EasyVision 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).

3.1.3.2.1.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 2 and Table 4. Role is SCU.

3.1.3.2.1.3. 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. No optional SOP classes are supported.

The Print SCU AE uses the following DIMSE Service Elements:

Table 12. 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

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 13. Attributes, when fetching all available attributes

Attribute name	Tag	Optional according 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 14. Attributes, when fetching minimum set of attributes

Attribute name	Tag	Optional according 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 15. SOP Class Attributes

SOP Class, DIMSE ServiceElement	Attribute name	Tag	Opt. according to Standard	Configurable	Default value
Basic Film SessionN-CREATE	Number of Copies	(2000,0010)	YES	YES	1
Basic Film SessionN-CREATE	Print Priority	(2000,0020)	YES	YES	MED
Basic Film SessionN-CREATE	Medium Type	(2000,0030)	YES	YES	BLUE FILM
Basic Film SessionN-CREATE	Film Destination	(2000,0040)	YES	YES	MAGAZINE
Basic Film BoxN-CREATE	Image Display Format	(2010,0010)	NO	NO	STANDARD\1,1
Basic Film BoxN-CREATE	Film Orientation	(2010,0040)	YES	YES	PORTRAIT
Basic Film BoxN-CREATE	Film Size ID	(2010,0050)	YES	YES	14INX17IN
Basic Film BoxN-CREATE	Magnification Type	(2010,0060)	YES	YES	(none)
Basic Film BoxN-CREATE	Max Density	(2010,0130)	YES	YES	(none)
Basic Film BoxN-CREATE	Configuration Information	(2010,0150)	YES	YES	(none)
Basic Film BoxN-CREATE	Smoothing Type	(2010,0080)	YES	YES	(none)
Basic Film BoxN-CREATE	Border Density	(2010,0100)	YES	YES	BLACK
Basic Film BoxN-CREATE	Empty Image Density	(2010,0110)	YES	YES	BLACK
Basic Film BoxN-CREATE	Min Density	(2010,0120)	YES	YES	(none)
Basic Film BoxN-CREATE	Trim	(2010,0140)	YES	YES	YES
Basic Grayscale Image BoxN-SET	Polarity	(2020,0020)	YES	YES	NORMAL

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

3.1.3.3. Association Acceptance Policy

The Print SCU AE does not handle incoming associations.

3.2. EasyAccess Enterprise(HPUX/W2K) AE Specifications

3.2.1. Storage SCU AE Specification (EasyAccess Enterprise(HPUX/W2K))

3.2.1.1. Association Establishment Policies

3.2.1.1.1. General

The maximum PDU size that the Storage SCU AE will use is 28672 Bytes (28 kBytes).

3.2.1.1.2. 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.

3.2.1.1.3. Asynchronous Nature

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

3.2.1.1.4. 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	UXSTOSCU_9_10

3.2.1.2. Association Initiation Policy

3.2.1.2.1. Real-World Activity - Send Command

3.2.1.2.1.1. Associated Real-World Activity

As described in the EasyVision User's Documentation, the EasyVision 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 EasyAccess Enterprise(HPUX/W2K), 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 Archive Manager.

3.2.1.2.1.2. Proposed Presentation Contexts

Possible proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 5 and Table 7. Role is SCU.



3.2.1.2.1.3. SOP-Specific Conformance

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

If settings and annotations have been made in the default setting for images in EasyVision, this information will be exported as Standard Grayscale Presentation State if the receiving side supports such (see ANNEX 4 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 EasyVision 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 Philips private attributes. These are documented in ANNEX 3.

3.2.1.2.2. Read-World Activity – Storage Commit

3.2.1.2.2.1. Associated Real-World Activity

Storage Commitment will be used when images are archived using Archive Manager and the remote DICOM archive supports Storage Commitment as SCP.

3.2.1.2.2.2. Proposed Presentation Contexts

Possible proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 5 and Table 7. Role is SCU.

3.2.1.2.2.3. 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.

3.2.1.3. Association Acceptance Policy

The Storage SCU AE does not handle incoming associations.

3.2.2. Storage SCP AE Specification (EasyAccess Enterprise(HPUX/W2K))

3.2.2.1. Association Establishment Policies

3.2.2.1.1. General

The maximum PDU-length, which a Storage SCP AE will use, is configurable. The default is 28672 Bytes (28 kBytes). Only Philips Medical Systems authorized personnel can do configuration.

3.2.2.1.2. Number of Associations

Each Storage SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Only Philips Medical Systems authorized personnel can do configuration.

Any number of Storage SCP AE's 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.

3.2.2.1.3. 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.

3.2.2.1.4. 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	UXSTOSCP_9_10

3.2.2.2. 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.

3.2.2.3. 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 EasyAccess Enterprise(HPUX/W2K) 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 EasyAccess Enterprise(HPUX/W2K) database.
- Request for Storage Commitment to store images in EasyAccess Enterprise(HPUX/W2K).

3.2.2.3.1. Verification of the Communication

3.2.2.3.1.1. Associated Real-World Activity

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

3.2.2.3.1.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 6 and Table 7. Role is SCP.

3.2.2.3.1.3. SOP Specific Conformance

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

3.2.2.3.1.4. Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

3.2.2.3.1.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 7.

3.2.2.3.2. Transfer of Images from a Remote System to the EasyAccess Enterprise(HPUX/W2K) database**3.2.2.3.2.1. Associated Real-World Activity**

A remote system wants to store images in the EasyAccess Enterprise(HPUX/W2K) database.

3.2.2.3.2.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 6 and Table 7. Role is SCP.

3.2.2.3.2.3. 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.

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 [8]) 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 EasyAccess Enterprise(HPUX/W2K) side, a status of refused, "Out of resources", will be returned to the association initiator.

EasyAccess Enterprise(HPUX/W2K) 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 EasyAccess Enterprise(HPUX/W2K). 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 EasyAccess Enterprise(HPUX/W2K) and EasyVision, see ANNEX 1.

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, $-(2^{32}-1) \leq x \leq (2^{32}-1)$, EasyAccess Enterprise(HPUX/W2K) will truncate all bits above the 32nd position.

Regarding viewing capabilities of EasyVision the following points must be noted

Multi-frame images in one dimension can be viewed in EasyVision; 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. EasyVision shows images with non-square pixels as if the pixels were square. It is possible to configure image import in EasyAccess Enterprise(HPUX/W2K) so that non-square pixels are transformed to square pixels.

Regarding color images, EasyVision can only view those with (0028,0004), Photometric interpretation, equal to RGB with 24 bits (8 bits per channel), (0028,0004), Photometric interpretation, equal to PALETTE_COLOR, or (0028,0004), Photometric interpretation, equal to YBR_FULL_422.

Images are handled color-by-pixel internally in EasyAccess Enterprise(HPUX/W2K) and EasyVision. In certain circumstances image that are sent color-by-plane to EasyAccess Enterprise(HPUX/W2K)/EasyVision are sent color-by-pixel if fetched from EasyVision/ EasyAccess Enterprise(HPUX/W2K).

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

EasyVision 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.

3.2.2.3.2.4. Presentation Context Acceptance Criterion

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

3.2.2.3.2.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 7.

3.2.2.3.3. Request to Commit to Store Images in the EasyAccess Enterprise(HPUX/W2K) Database

3.2.2.3.3.1. Associated Real-World Activity

A remote system makes a request for EasyAccess Enterprise(HPUX/W2K) to commit to store a number of images.

3.2.2.3.3.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 6 and Table 7. Role is SCP.

3.2.2.3.3.3. 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 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 EasyAccess Enterprise(HPUX/W2K) server load, but it can be expected to be short (seconds).

Warning: Any time after the images have been committed with Storage Commitment, they can be deleted by a EasyVision 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 EasyAccess Enterprise(HPUX/W2K) server. If an Q/R SCP is connected towards the EasyAccess Enterprise(HPUX/W2K) server at time of commitment, the AE title of it will be returned in the N-EVENT-REPORT message sent to the SCU.

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

3.2.2.3.3.4. Presentation Context Acceptance Criterion

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

3.2.2.3.3.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 7.

3.2.3. Q/R SCU AE Specification (EasyAccess Enterprise(HPUX/W2K))

3.2.3.1. Association Establishment Policies

3.2.3.1.1. General

The maximum PDU size that the Q/R SCU AE will use is 28672 Bytes (28 kBytes).

3.2.3.1.2. Number of Associations

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

3.2.3.1.3. Asynchronous Nature

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

3.2.3.1.4. 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	WQIRSCU_9_10

3.2.3.2. Association Initiation Policy

3.2.3.2.1. Real-World Activity – Fetch from DICOM archive Command

3.2.3.2.1.1. Associated Real-World Activity

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

3.2.3.2.1.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 5 and Table 7. Role is SCU.

3.2.3.2.1.3. SOP-Specific Conformance

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

3.2.3.3. Association Acceptance Policy

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

3.2.4. Q/R SCP AE Specification (EasyAccess Enterprise(HPUX/W2K))**3.2.4.1. Association Establishment Policies****3.2.4.1.1. General**

The maximum PDU-length that the Q/R SCP AE will use is configurable. Default is 28672 Bytes (28 kBytes). Only Philips Medical Systems authorized personnel can do configuration.

3.2.4.1.2. Number of Associations

The Q/R SCP AE can handle at most 100 simultaneous associations at a time.

3.2.4.1.3. 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.

3.2.4.1.4. 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_9_10

3.2.4.2. 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.

3.2.4.3. 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 EasyAccess Enterprise(HPUX/W2K) database
- Retrieve images from the EasyAccess Enterprise(HPUX/W2K) database

3.2.4.3.1. Verification of the Communication

3.2.4.3.1.1. Associated Real-World Activity

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

3.2.4.3.1.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 6 and Table 7. Role is SCP.

3.2.4.3.1.3. SOP Specific Conformance

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

3.2.4.3.1.4. Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

3.2.4.3.1.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 7.

3.2.4.3.2. Query of the EasyAccess Enterprise(HPUX/W2K) Database

3.2.4.3.2.1. Associated Real-World Activity

A remote system wants to query the EasyAccess Enterprise(HPUX/W2K) database using the C-FIND command.

3.2.4.3.2.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 6 and Table 7. Role is SCP. Extended negotiation is supported.

3.2.4.3.2.3. 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 500 matches are returned. The hit limit can be configured. If there are more items than the hit limit in the EasyAccess Enterprise(HPUX/W2K) database, zero matches are returned.
- ANNEX 2 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 is 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 point on the day the query is done is returned. If no matches are found, a response with SUCCESS is sent.

3.2.4.3.2.4. Presentation Context Acceptance Criterion

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

3.2.4.3.2.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 7.

3.2.4.3.3. Retrieve Images from the EasyAccess Enterprise(HPUX/W2K) Database

3.2.4.3.3.1. Associated Real-World Activity

A remote application entity wishes to retrieve images from the EasyAccess Enterprise(HPUX/W2K) database using the C-MOVE command.

3.2.4.3.3.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 6 and Table 7. Role is SCP.

3.2.4.3.3.3. 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.

3.2.4.3.3.4. Presentation Context Acceptance Criterion

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

3.2.4.3.3.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 7.

3.2.5. Notif SCU AE Specification (EasyAccess Enterprise(HPUX/W2K))

3.2.5.1. Association Establishment Policies

3.2.5.1.1. General

The maximum PDU size that the Notif SCU AE will use is 28672 Bytes (28 kBytes).

3.2.5.1.2. 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.

3.2.5.1.3. Asynchronous Nature

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

3.2.5.1.4. 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_9_10

3.2.5.2. Association Initiation Policy**3.2.5.2.1. Real-World Activity - Send Command****3.2.5.2.1.1. Associated Real-World Activity**

If EasyAccess Enterprise(HPUX/W2K) 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.

3.2.5.2.1.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 5 and Table 7. Role is SCU.

3.2.5.2.1.3. 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 5.3.1 for details.

3.2.5.3. Association Acceptance Policy

The Notif SCU AE does not handle incoming associations.

3.3. EasyAccess Entry AE Specifications**3.3.1. Storage SCU AE Specification (EasyAccess Entry)****3.3.1.1. Association Establishment Policies****3.3.1.1.1. General**

The maximum PDU size that the Storage SCU AE will use is 28672 Bytes (28 kBytes).

3.3.1.1.2. 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.

3.3.1.1.3. Asynchronous Nature

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

3.3.1.1.4. 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	WISTOSCU_9_10

3.3.1.2. Association Initiation Policy**3.3.1.2.1. Real-World Activity - Send Command****3.3.1.2.1.1. Associated Real-World Activity**

As described in the EasyVision User's Documentation, the EasyVision 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 EasyAccess Entry, 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 Archive Manager.

3.3.1.2.1.2. Proposed Presentation Contexts

Possible proposed abstract syntaxes and transfer syntaxes can be found by investigating Table 8 and Table 10. At most three transfer syntaxes are proposed at the same time. Implicit Little Endian is always proposed. If the image is internally stored in another transfer syntax, that syntax is proposed too. If configured so, compression transfer syntax will be proposed too. Role is SCU.

3.3.1.2.1.3. 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 EasyAccess Entry, the exported images will contain the values from EasyAccess Entry.

If settings and annotations have been made in the default setting for images in EasyVision, this information will be exported as Standard Grayscale Presentation State if the receiving side supports such (see ANNEX 4 for details), otherwise the annotations will be exported standard DICOM overlays.

If the EasyVision 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 Philips private attributes. These are documented in ANNEX 3.

3.3.1.3. Association Acceptance Policy

The Storage SCU AE does not handle incoming associations.

3.3.2. Storage SCP AE Specification (EasyAccess Entry)

3.3.2.1. Association Establishment Policies

3.3.2.1.1. General

The maximum PDU-length, which a Storage SCP AE will use, is configurable. The default is 28672 Bytes (28 kBytes). Allowed values are between 4096 Bytes (4 kBytes) and 131072 bytes (128 kBytes) including these values.

Configuration can only be done by Philips Medical Systems authorized personnel.

3.3.2.1.2. Number of Associations

Each Storage SCP AE can handle five simultaneous associations at a time by default. This number is configurable. Any number of Storage SCP AE's 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.

Configuration can only be done by Philips Medical Systems authorized personnel.

3.3.2.1.3. 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.

3.3.2.1.4. 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_9_10

3.3.2.2. Association Initiation Policy

Storage SCP will not initiate association.

3.3.2.3. 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 EasyAccess Entry 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 EasyAccess Entry database.
 - Request for Storage Commitment to store images in EasyAccess Entry.



3.3.2.3.1. Verification of the Communication

3.3.2.3.1.1. Associated Real-World Activity

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

3.3.2.3.1.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 9 and Table 10. Role is SCP.

3.3.2.3.1.3. SOP Specific Conformance

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

3.3.2.3.1.4. Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

3.3.2.3.1.5. Transfer Syntax Selection Policies

Transfer Syntax Selection is done according to the order in Table 10.

3.3.2.3.2. Transfer of Images from a Remote System to the EasyAccess Entry database

3.3.2.3.2.1. Associated Real-World Activity

A remote system wants to store images in the EasyAccess Entry database.

3.3.2.3.2.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 9 and Table 10. Role is SCP.

3.3.2.3.2.3. 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.

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 [8]) 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 EasyAccess Entry side, a status of refused, "Out of resources", will be returned to the association initiator.

EasyAccess Entry 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 EasyAccess Entry.

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 EasyAccess Entry and EasyVision, see ANNEX 1. If DICOM attributes are illegal, no responsibilities for consequences are taken. Regarding viewing capabilities of EasyVision the following points must be noted. Multi-frame images in one dimension can be viewed in EasyVision; 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. EasyVision shows images with non-square pixels as if the pixels were square. It is possible to configure image import in EasyAccess Entry so that non-square pixels are transformed to square pixels.

Regarding color images, EasyVision can only view those with (0028,0004), Photometric interpretation, equal to RGB with 24 bits (8 bits per channel), (0028,0004), Photometric interpretation, equal to PALETTE_COLOR, or (0028,0004), Photometric interpretation, equal to YBR_FULL_422. Images are handled color-by-pixel internally in EasyAccess Entry and EasyVision. In certain circumstances image that are sent color-by-plane to EasyAccess Entry /EasyVision are sent color-by-pixel if fetched from EasyVision/ EasyAccess Entry. The first LUT in a Modality LUT sequence (attribute (0028,3000), Modality LUT Sequence, etc.) is handled. The rest (second, third and so on) are ignored. EasyVision 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.

3.3.2.3.2.4. Presentation Context Acceptance Criterion

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

3.3.2.3.2.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 10.

3.3.2.3.3. Request to Commit to Store Images in the EasyAccess Entry Database

3.3.2.3.3.1. Associated Real-World Activity

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

3.3.2.3.3.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 9 and Table 10. Role is SCP.

3.3.2.3.3.3. 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 EasyAccess Entry 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 a EasyVision 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 EasyAccess Entry server. If an Q/R SCP is connected towards the EasyAccess Entry server at time of commitment, the AE title of it will be returned in the N-EVENT-REPORT message sent to the SCU. The optional Storage Media File-Set ID & UID attributes will never be filled in by the Storage SCP AE.

3.3.2.3.3.4. Presentation Context Acceptance Criterion

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

3.3.2.3.3.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 10.

3.3.3. Q/R SCU AE Specification (EasyAccess Entry)

3.3.3.1. Association Establishment Policies

3.3.3.1.1. General

The maximum PDU size that the Q/R SCU AE will use is 28672 Bytes (28 kBytes).

3.3.3.1.2. Number of Associations

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

3.3.3.1.3. Asynchronous Nature

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

3.3.3.1.3.1. 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_9_10

3.3.3.2. Association Initiation Policy

3.3.3.2.1. Real-World Activity – Fetch from DICOM archive Command

3.3.3.2.1.1. Associated Real-World Activity

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

3.3.3.2.1.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 8 and Table 10. Role is SCU.

3.3.3.2.1.3. SOP Specific Conformance

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

3.3.3.3. Association Acceptance Policy

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

3.3.4. Q/R SCP AE Specification (EasyAccess Entry)**3.3.4.1. Association Establishment Policies****3.3.4.1.1. General**

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

3.3.4.1.2. Number of Associations

The Q/R SCP AE can handle at most 100 simultaneous associations at a time.

3.3.4.1.3. 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.

3.3.4.1.4. 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	WQSRSCP_9_10

3.3.4.2. 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.

3.3.4.3. 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 EasyAccess Entry database
- Retrieve images from the EasyAccess Entry database

3.3.4.3.1. Verification of the Communication

3.3.4.3.1.1. Associated Real-World Activity

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

3.3.4.3.1.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 9 and Table 10. Role is SCP.

3.3.4.3.1.3. SOP Specific Conformance

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

3.3.4.3.1.4. Presentation Context Acceptance Criterion

There are no specific rules for acceptance.

3.3.4.3.1.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 10.

3.3.4.3.2. Query of the EasyAccess Entry Database

3.3.4.3.2.1. Associated Real-World Activity

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

3.3.4.3.2.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 9 and Table 10. Role is SCP. Extended negotiation is not supported.

3.3.4.3.2.3. 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 500 matches are returned. This hit limit can be configured. If more items than the hit limit in the EasyAccess Entry database matches, zero matches are returned.
- ANNEX 2 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 is 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 point on the day the query is done is returned. In case of no matching examinations, a response of SUCCESS is sent.

3.3.4.3.2.4. Presentation Context Acceptance Criterion

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

3.3.4.3.2.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 10.

3.3.4.3.3. Retrieve Images from the EasyAccess Entry Database

3.3.4.3.3.1. Associated Real-World Activity

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

3.3.4.3.3.2. Accepted Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes is found by investigating Table 9 and Table 10. Role is SCP.

3.3.4.3.3.3. 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.

3.3.4.3.3.4. Presentation Context Acceptance Criterion

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

3.3.4.3.3.5. Transfer Syntax Selection Policies

The transfer syntax selection is done according to the order in Table 10.

3.3.5. Notif SCU AE Specification (EasyAccess Entry)

3.3.5.1. Association Establishment Policies

3.3.5.1.1. General

The maximum PDU size that the Notif SCU AE will use is 28672 Bytes (28 kBytes).

3.3.5.1.2. 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.

3.3.5.1.3. Asynchronous Nature

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

3.3.5.1.4. 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_9_10

3.3.5.2. Association Initiation Policy**3.3.5.2.1. Real-World Activity - Send Command****3.3.5.2.1.1. Associated Real-World Activity**

If EasyAccess 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.

3.3.5.2.1.2. Proposed Presentation Contexts

The proposed abstract syntaxes and transfer syntaxes are found by investigating Table 8 and Table 10. Role is SCU.

3.3.5.2.1.3. 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 8.3.1 for details.

3.3.5.3. Association Acceptance Policy

The Notif SCU AE does not handle incoming associations.

4. COMMUNICATION PROFILES

4.1. Supported Communication Stacks

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

4.2. TCP/IP Stack

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

4.2.1. Physical Media Support

All AE's 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.

4.3. OSI Stack

Not supported.

4.4. Point-To-Point Stack

Not supported.

5. EXTENSIONS/SPECIALIZATION/PRIVATIZATION

5.1. Transfer Syntaxes

The Private Compression Transfer Syntax can be used between different components of Sectra PACS. The UID of the Transfer Syntax is **1.2.752.24.3.7.6**.

5.2. Private Attributes

See ANNEX 3.

5.3. Standard extended SOP Classes

5.3.1. Basic Study Content Notification SOP Class

If configured so the Notif SCU AE of EasyAccess Entry /Enterprise(HPUX/W2K) 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 ate	(0010,0030)	3	Birth date of the patient
Patient's Sex	(0010,0040)	3	Sex of the named patient
Study Comments	(0032,4000)	3	User-defined comments about the study. Used values: ADD (indicating that the study has been added to the PACS)

6. CONFIGURATION

6.1. EasyVision

Configuration files are found in the XXX\Philips\EasyVision\Config\... directory where XXX is specified at installation. See installation guide for EasyVision.

6.1.1. Storage SCP

More information about configuration for Storage SCP can be found in EasyVision System Administrators Guide.

- **Configuration file**
The file ctnstore_scp.def contains configuration for Storage SCP.
- **AE title**
Default AE Title is first part of host name in uppercase with an additional Storage behind it. For Example: host = john.net => AE title = JOHNSTORE
- **Port**
Default port is **7820**.

6.1.2. Q/R-MWL SCU

More information about configuration for Storage SCP can be found in EasyVision System Administrators Guide.

Configuration file

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

6.1.3. Print SCU

More information about configuration for Storage SCP can be found in EasyVision System Administrators Guide.

- **Configuration file**
The file dicom_printer.def contains configuration for Print SCU.
- **AE Title**
The default AE title is **DICOM_PRINT_SCU**.
- **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**.

6.1.4. DICOM Media

More information about configuration for DICOM Media can be found in EasyVision System Administrators Guide.

- **Configuration file**
The file cd_export_import.def contains configuration for DICOM Media.

6.2. EasyAccess Enterprise(HPUX/W2K)

6.2.1. Storage SCU

Configuration is specified in the teleradiology section of the EasyAccess Enterprise(HPUX/W2K) System Administrator's Guide.

- **Configuration file**
The file `/etc/opt/sectra/wise_send.rc` contains configuration for Storage SCU.
- **Remote AE**
The remote Applications Entities AE-title, host name and port number are specified the configuration file `/etc/opt/sectra/wise_send.def` using the tool `w_config_telerad`. More details can be found in the teleradiology section of the EasyAccess Enterprise(HPUX/W2K) System Administrator's Guide.

6.2.2. Storage SCP

- **AE title**
The AE title of each AE can be configured. This is done running the administration program `/opt/sectra/bin/dcm_adm` as described in the Working Storage Manager Installation Guide. Any number of AE's can be set up. The default AE title is **DICOM_STORAGE**.
- **Port**
The listen port of each AE can be also configured with the EasyAccess Tool `/opt/sectra/bin/dcm_adm`. You can either set a listen port yourself or let the program automatically select a free listen port.
- **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.
- **Additional configuration**
For further configuration see the Working Storage Manager (Unix) Installation Guide and System Administrator's Guide.

6.2.3. 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 Archive Manager Administrators Guide for HP-UX .

6.2.4. Q/R SCP

- **AE title**
The AE title can be configured. This is done using the EasyAccess Enterprise(HPUX/W2K) Tool `/opt/sectra/bin/w_config_qr` as described in the Working Storage Manager Installation Guide. Any number of AE's can be set up. The default AE-title is `QR_SCP_EasyAccess`. 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.
- **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 Working Storage Manager Installation Guide. The default is **7632**.

- **Remote AE**
The remote Applications Entity's AE-title, host name and port number are specified using the EasyAccess Enterprise(HPUX/W2K) Tool /opt/sectra/bin/w_config_qr as described in the Working Storage Manager Installation Guide. 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 ImageServer4/S Installation Guide.
- **Additional configuration**
- For further configuration see the Working Storage Manager (Unix) Installation Guide and System Administrator's Guide.

6.2.5. Notif SCU

Configuration is described in the EasyAccess Enterprise(HPUX/W2K) System Administrator's Guide.

- **Configuration file**
The file /etc/opt/sectra/wise_ris.def contains configuration for Notif SCU.
- **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**.

6.3. EasyAccess Entry

Configuration files can be found in XXX\sectra\EasyAccessEntry\Config\... where XXX is specified at installation. See installation guides for EasyAccess Entry on Windows.

6.3.1. Storage SCU

- **Configuration file**
The file ctn_qrscu.def contains configuration for Storage SCU.
- **Remote AE**
By default the Storage SCU must recognize remote hosts.

6.3.2. Storage SCP

- **Configuration file**
The file ctn_store.def contains configuration for Storage SCP.
- **AE title**
Default AE title is **DICOM_STORAGE**.
- **Port**
Default port is **7810**.
- **Remote AE**
Storage SCP must recognize remote hosts.

6.3.3. 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 Archive Manager FS_xd System's Administrators Guide for Windows.

6.3.4. Q/R SCP

- **Configuration file**
The file `ctn_qrscp.def` contains configuration for Q/R SCP.
- **AE title**
Default AE title is **DICOM_QR_SCP**.
- **Port**
Default port is **7840**.
- **Remote AE**
Storage SCP must recognize remote hosts.

6.3.5. Notif SCU

Configuration is described in the EasyAccess Entry System Administrator's Guide.

- **Configuration file**
The file `wise_ris.def` contains configuration for Notif SCU.
- **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**.

7. SUPPORT OF EXTENDED CHARACTER SETS

7.1. Supported Extended Character Sets

All AE's provide support for the ISO_IR 100 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.

EasyVision handles most character repertoires used in Western Europe.

ANNEX 1. 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 EasyAccess Entry/Enterprise(HPUX/W2K) and EasyVision. The comments give indication what the attributes are used for. If an attribute is not present in this list it is still stored by EasyAccess Entry/Enterprise(HPUX/W2K) but ignored by EasyVision. For the Print SCU AE attributes, see 3.3 Print SCU AE Specification. For supported attributes as keys for the Q/R SCP AE in a C-FIND request, see ANNEX 2. For supported attributes in exported presentation states, see ANNEX 2.

Table 16. Attribute List for a Storage SCP AE

DICOM Attribute	Comment
(0008,0005) Specific Character Set	<ul style="list-style-type: none"> "ISO_IR 100" is supported.
(0008,0008) Image Type	<ul style="list-style-type: none"> Is used for determining default window setting in EasyVision if no window is included in the image. Third value used by w_store in default scanogram finding method, and method "-S A"
(0008,0016) SOP Class UID	<ul style="list-style-type: none"> Stored in an EasyAccess image data (max 64 characters)
(0008,0018) SOP Instance UID	<ul style="list-style-type: none"> Stored in an EasyAccess image data (max 64 characters) Required attribute for compression. Used in w_store to overwrite equivalent image (if -k is not specified).
(0008,0020) Study Date	<ul style="list-style-type: none"> Stored in an EasyAccess examination data if value not found in RIS Shown in all EasyVision image windows if present and (0008,0023) and (0008,0022) and (0008,0021) not present
(0008,0021) Series Date	<ul style="list-style-type: none"> Shown in all EasyVision image windows if present and (0008,0023) and (0008,0022) not present
(0008,0022) Acquisition Date	<ul style="list-style-type: none"> Shown in all EasyVision image windows if present and (0008,0023) not present.
(0008,0023) Image Date	<ul style="list-style-type: none"> If present, shown in all EasyVision image windows.
(0008,0030) Study Time	<ul style="list-style-type: none"> Stored in an EasyAccess examination data if value not found in RIS Shown in all EasyVision image windows if present and (0008,0033) and (0008,0022) and (0008,0021) not present
(0008,0031) Series Time	<ul style="list-style-type: none"> Shown in all EasyVision image windows if present and (0008,0033) and (0008,0032) not present.
(0008,0032) Acquisition Time	<ul style="list-style-type: none"> Shown in all EasyVision image windows if present and (0008,0033) not present.
(0008,0033) Image Time	<ul style="list-style-type: none"> If present, shown in all EasyVision image windows.
(0008,0050) Accession Number	<ul style="list-style-type: none"> Stored in an EasyAccess examination data (max 16 characters). Default attribute for examination number in an EasyAccess. Used for connecting the image to RIS entities
(0008,0060) Modality	<ul style="list-style-type: none"> Stored in an EasyAccess series data (max 32 characters). Stored in an EasyAccess exam data (max 16 characters). Defines modality for modality specific settings in EasyVision (e.g. information in images and selecting

DICOM Attribute	Comment
	default print partition).
(0008,0080) Institution Name	<ul style="list-style-type: none"> Stored in An EasyAccess examination data (max 32 characters).
(0008,0090) Referring Physician's Name	<ul style="list-style-type: none"> Stored in An EasyAccess request data (max 64 characters).
(0008,1010) Station Name	<ul style="list-style-type: none"> Stored in An EasyAccess series data (max 64 characters). Stored in An EasyAccess exam data (max 32 characters).
(0008,1030) Study Description	<ul style="list-style-type: none"> Stored in An EasyAccess examination data (max 64 characters).
(0008,1050) Performing Physician's Name	<ul style="list-style-type: none"> Stored in An EasyAccess examination data (max 32 characters).
(0008,1140) Referenced Image Sequence	<ul style="list-style-type: none"> Used by An EasyAccess in default method for locating scanograms.
(0008,1155) Referenced SOP Instance UID	<ul style="list-style-type: none"> Used by An EasyAccess in default method for locating scanograms.
(0010,0010) Patient Name	<ul style="list-style-type: none"> Stored in An EasyAccess patient data if value not found in RIS (max 64 characters).
(0010,0020) Patient ID	<ul style="list-style-type: none"> Must be set. If not, (0010,0010) Patient Name is used as Patient ID in An EasyAccess. If both (0010,0020) Patient ID and (0010,0010) Patient Name are empty, the request number is used as Patient ID in An EasyAccess. Stored in An EasyAccess patient data if value not found in RIS (max 64 characters). Used as request number in An EasyAccess if attribute for request number (default: (0020,0010) Study ID) is empty.
(0010,0030) Patient's Birth Date	<ul style="list-style-type: none"> Stored in An EasyAccess patient data if value not found in RIS.
(0010,0040) Patient's Sex	<ul style="list-style-type: none"> Stored in An EasyAccess patient data if value not found in RIS.
(0018,0010) Contrast/Bolus Agent	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT images
(0018,0015) Body Part Examined	<ul style="list-style-type: none"> Stored in An EasyAccess examination data (max 32 characters).
(0018,0020) Scanning Sequence	<ul style="list-style-type: none"> Shown in EasyVision image window for all MR images if (0018,0024) not present.
(0018,0024) Sequence Name	<ul style="list-style-type: none"> If present, shown in EasyVision image window for all MR images
(0018,0050) Slice Thickness	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT and MR images
(0018,0060) KVP	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT images
(0018,0080) Repetition Time	<ul style="list-style-type: none"> Shown in EasyVision image window for all MR images
(0018,0081) Echo Time	<ul style="list-style-type: none"> Shown in EasyVision image window for all MR images
(0018,0083) Number of Averages	<ul style="list-style-type: none"> Shown in EasyVision image window for all MR images
(0018,1041) Contrast/Bolus Volume	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT and MR images
(0018,1100) Reconstruction Diameter	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT and MR images
(0018,1120) Gantry/Detector Tilt	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT images
(0018,1150) Exposure Time	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT images
(0018,1151) X-ray Tube Current	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT images
(0018,1164) Imager Pixel Spacing	<ul style="list-style-type: none"> Used for calibrating the image in EasyVision if (0028,0030) is not set.
(0018,1210) Convolution Kernel	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT images
(0018,1602) Shutter Left Vertical Edge	<ul style="list-style-type: none"> Is used for EasyVision cropping.
(0018,1604) Shutter Right Vertical Edge	<ul style="list-style-type: none"> Is used for EasyVision cropping.
(0018.1606) Shutter Upper Horizontal	<ul style="list-style-type: none"> Is used for EasyVision cropping.

DICOM Attribute	Comment
Edge	
(0018,1608) Shutter Lower Horizontal Edge	<ul style="list-style-type: none"> Is used for EasyVision cropping.
(0018,1610) Center of Circular Shutter	<ul style="list-style-type: none"> If present and (0018,1602) - (0018,1608) not present, defines an EasyVision square cropping.
(0018,1612) Radius of Circular Shutter	<ul style="list-style-type: none"> If present and (0018,1602) - (0018,1608) not present, defines an EasyVision square cropping.
(0018,5100) Patient Position	<ul style="list-style-type: none"> Shown in EasyVision image window for all CT and MR images
(0020,000D) Study Instance UID	<ul style="list-style-type: none"> Stored in An EasyAccess examination data (max 64 characters).
(0020,000E) Series Instance UID	<ul style="list-style-type: none"> Stored in An EasyAccess series data (max 64 characters). Is used for non-default method for identifying scanogram images if "-S U" option is used with w_store. By default, must be equal for all images within a stack.
(0020,0010) Study ID	<ul style="list-style-type: none"> Stored in An EasyAccess examination data (max 16 characters). Default attribute for request number in An EasyAccess. Used for connecting the image to RIS entities.
(0020,0011) Series Number	<ul style="list-style-type: none"> Stored in An EasyAccess series data Is used for non-default method for identifying scanogram images if "-S S" option is used with w_store.
(0020,0013) Instance (Image) Number	<ul style="list-style-type: none"> Stored in An EasyAccess image data Is used for non-default method for identifying scanogram images if "-S I" option is used with w_store. Shown in EasyVision image window for all CT and MR images
(0020,0020) Patient Orientation	<ul style="list-style-type: none"> Always shown in EasyVision 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)	<ul style="list-style-type: none"> Important attribute for showing location of images in scanograms in EasyVision. Needs to be present in both the stack and in the scanogram. See also (0020,0037) and (0028,0030).
(0020,0037) Image Orientation (Patient)	<ul style="list-style-type: none"> Important attribute for showing location of images in scanograms in EasyVision. 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	<ul style="list-style-type: none"> Is used for non-default method for identifying scanogram images if "-S A" option is used with w_store.
(0028,0002) Samples per Pixel	<ul style="list-style-type: none"> If not set, 1 is assumed in EasyVision.
(0028,0004) Photometric Interpretation	<ul style="list-style-type: none"> MONOCHROME1, MONOCHROME2, PALETTE_COLOR and RGB are supported by EasyVision. If this attribute is not set, MONOCHROME2 is used by EasyVision.
(0028,0006) Planar Configuration	<ul style="list-style-type: none"> If not set, 000 is assumed by EasyVision.
(0028,0008) Number of Frames	<ul style="list-style-type: none"> If not set, 1 is assumed by EasyVision.
(0028,0010) Rows	<ul style="list-style-type: none"> Must be set to be viewable in EasyVision.
(0028,0011) Columns	<ul style="list-style-type: none"> Must be set to be viewable in EasyVision
(0028,0030) Pixel Spacing	<ul style="list-style-type: none"> Used for calibrating the image in EasyVision. If empty (0018,1164) is used. Important attribute for showing location of images in scanograms in EasyVision. Needs to be present in both the stack and in the scanogram. See also (0020,0032) and (0020,0037). An images with non-square pixels can be transformed to an image with square pixels during image import.

DICOM Attribute	Comment
	EasyVision can only handle images with square pixels.
(0028,0034) Pixel Aspect Ratio	<ul style="list-style-type: none"> Not used. 1/1 assumed by EasyVision. There are possibilities to convert non-square pixels to square pixels in image import.
(0028,0100) Bits Allocated	<ul style="list-style-type: none"> Must be set to be viewable in EasyVision
(0028,0101) Bits Stored	<ul style="list-style-type: none"> Must be set and less than (0028,0100) Bits Allocated to be viewable in EasyVision.
(0028,0102) High Bit	<ul style="list-style-type: none"> If not set, (Bit Stored)-1 is used by EasyVision. If set, must be between greater than 0 and less than or equal to Bits Allocated. If not, (Bits Stored)-1 is used by EasyVision.
(0028,0103) Pixel Representation	<ul style="list-style-type: none"> If not set, 0000H (unsigned integer) is assumed by EasyVision.
(0028,1050) Window Center	<ul style="list-style-type: none"> If not set, the default in EASYVISION is half the bit depth.
(0028,1051) Window Width	<ul style="list-style-type: none"> If not set, the default in EasyVision is the bit depth.
(0028,1052) Rescale Intercept	<ul style="list-style-type: none"> Is used for calculating Hounsfield units of CT images in EasyVision.
(0028,1053) Rescale Slope	<ul style="list-style-type: none"> Is used for calculating Hounsfield units of CT images in EasyVision.
(0028,3000) Modality LUT Sequence	<ul style="list-style-type: none"> The first LUT in a sequence is used by EasyVision, the rest is ignored.
(0028,3002) LUT Descriptor	<ul style="list-style-type: none"> Must be set if (0028,3000) Modality LUT Sequence is used.
(0028,3006) LUT Data	<ul style="list-style-type: none"> Must be set if (0028,3000) Modality LUT Sequence is used.
(0040,0244) Performed Procedure Step Start Date	<ul style="list-style-type: none"> Stored in An EasyAccess series data
(0040,0245) Performed Procedure Step Start Time	<ul style="list-style-type: none"> Stored in An EasyAccess series data
(0040,0254) Performed Procedure Step Description	<ul style="list-style-type: none"> Stored in An EasyAccess examination data, comments field (max 512 characters).
(0040, 0275) Request Attribute Sequence>(0040,0009) Scheduled Procedure Step Id>(0040,1001) Requested Procedure Id	<ul style="list-style-type: none"> Stored in An EasyAccess series data
(7FE0,0010) Pixel Data	<ul style="list-style-type: none"> Must be set.

ANNEX 2. 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 corresponds 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. A “**X**” in the HPUX and W2K columns indicate if the key is supported on **EasyAccess(HPUX)** and **EasyAccess Entry/Enterprise(W2K)** respectively.

Table 17. PATIENT Level

Key	Tag	Type			HPUX	W2K	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 18. STUDY Level

Key	Tag	Type			HPUX	W2K	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	-	
Referring Physician's Name	(0008,0090)	M	M	M	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	-	
Number of Study Related Instances	(0020,1208)	R	R	R	X	-	

Table 19. SERIES Level

Key	Tag	Type		HPUX	W2K	Comment
		Pat	Study			
Modality	(0008,0060)	M	M	X	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	-	
Request Attribute Sequence	(0040,0275)					
>Request Procedure ID	(0040,1001)	M	M	X	-	
>Scheduled Procedure ID	(0040,0009)	M	M	X	-	
Performed Procedure Step Start Date	(0040,0244)	M	M	X	-	
Performed Procedure Step Start Time	(0040,0245)	M	M	X	-	

Table 20. INSTANCE Level

Key	Tag	Type		HPUX	W2K	Comment
		Pat	Study			
SOP Class UID	(0008,0016)	M	M	X	X	
SOP Instance UID	(0008,0018)	M	M	X	X	
Instance Number	(0020,0013)	M	M	X	X	
Referenced Series Sequence	(0008,1115)					
>Series Instance UID	(0008,1115)	R	R	X	-	Presentation States only
>Referenced Image Sequence	(0008,1140)					
>>Referenced SOP Class UID	(0008,1150)	R	R	X	-	Presentation States only
>>Reference SOP Instance UID	(0008,1155)	R	R	X	-	Presentation States only
Number of Frames	(0028,0008)	R	R	X	-	Images only
Rows	(0028,0010)	R	R	X	-	Images only
Columns	(0028,0011)	R	R	X	-	Images only
Bits Allocated	(0028,0100)	R	R	X	-	Images only
Presentation Label	(0070,0080)	R	R	X	-	Presentation States only
Presentation Description	(0070,0081)	R	R	X	-	Presentation States only
Presentation Creation Date	(0070,0082)	R	R	X	-	Presentation States only
Presentation Creation Time	(0070,0083)	R	R	X	-	Presentation States only

ANNEX 3. 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
(0029,00yy)	Private creator code	LO	1	Value: SECTRA_ImageInfo_01
(0029,yy01)	Image info	OB	1	Image settings made on an EASYVISION workstation

ANNEX 4. Exported Presentation States

If the EasyVision 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 EasyVision settings and annotations.

If the EasyVision 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 an EasyAccess system will be exported in a transparent way.

Module	EasyVision correspondence	Note
Presentation State	-	Label: "EasyVision DEFAULT" Description: "EasyVision 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 EasyVision settings.
Graphic Annotation	All overlays 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.
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":