
VITAL

A Toshiba Medical Systems Group Company

Company Name: Vital Images
Product Name: Vitrea 6.2/ fX 6.2
DICOM 3.0 Conformance Statement
Internal Document Number: VLC-06978A
Date: 10/31/2011

IMPORTANT

1. No part of this document may be copied or reprinted, in whole or in part, without written permission of the Vital Organization.
2. The contents of this document are subject to change without prior notice and without legal obligation.

1 Conformance Overview

The application supports querying remote systems for a list of DICOM objects which may then be retrieved to the local system. It also supports remote systems querying for a list of objects and then retrieving them. Query and Retrieve only support Hierarchical queries. Only CT, MR and PET storage SOP Classes can be loaded, viewed and printed, but all supported SOP Classes can be sent to remote systems. CT, MR, XA and Secondary Capture instances can be generated and sent to remote systems. GSPS can be generated for CT and MR instances and sent to remote systems. Storage Commitment is supported when sending instances and GSPS to remote systems. Importing and creating of Media is also supported.

Table 1-1 Network Services

SOP Classes	Provider of Service (SCP)	User of Service (SCU)
Transfer		
Verification	Yes	Yes
CT Image Storage	Stored and Viewed	Yes
Enhanced CT Image Storage	Stored and Viewed	Yes
MR Image Storage	Stored and Viewed	Yes
Enhanced MR Image Storage	Stored and Viewed	Yes
Segmentation Image Storage	Stored and Viewed	Yes
X-Ray 3D Angiographic Image Storage	Stored and Viewed	Yes
Computed Radiography Image Storage	Stored Only	Yes
Digital X-Ray Image Storage – For Presentation	Stored Only	Yes
Digital Mammography X-Ray Image Storage – For Processing	Stored Only	Yes
Digital Intra-Oral X-Ray Image Storage – For Presentation	Stored Only	Yes
<i>Ultrasound Multi-frame Image Storage (Retired)</i>	Stored Only	Yes
Ultrasound Multi-frame Image Storage	Stored Only	Yes
<i>Ultrasound Image Storage (Retired)</i>	Stored Only	Yes
Ultrasound Image Storage	Stored Only	Yes
X-Ray Angiographic Image Storage	Stored Only	Yes
X-Ray Radiofluoroscopic Image Storage	Stored Only	Yes
<i>Nuclear medicine Image Storage (Retired)</i>	Stored Only	Yes
Nuclear Medicine Image Storage	Stored Only	Yes
Secondary Capture Image Storage	Stored Only	Yes
Multi-frame Single Bit Secondary Capture Image Storage	Stored Only	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	Stored Only	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	Stored Only	Yes
Multi-frame True Color Secondary Capture Image Storage	Stored Only	Yes
<i>VL Image Storage (Retired)</i>	Stored Only	Yes
<i>VL Multi-frame Image Storage (Retired)</i>	Stored Only	Yes
VL Endoscopic Image Storage	Stored Only	Yes

VL Microscopic Image Storage	Stored Only	Yes
VL Slide-Coordinates Microscopic Image Storage	Stored Only	Yes
VL Photographic Image Storage	Stored Only	Yes
Photon Emission Tomography Image Storage	Stored Only	Yes
RT Image Storage	Stored Only	Yes
Basic Text SR	Stored Only	Yes
Enhanced SR	Stored Only	Yes
Comprehensive SR	Stored Only	Yes
Mammography CAD SR	Stored Only	Yes
Key Object Selection Document	Stored Only	Yes
Chest CAD SR	Stored Only	Yes
Study Root Q/R – FIND	Yes	Yes
Study Root Q/R – MOVE	Yes	Yes
Storage Commitment Push Model	No	Yes

Table 1-2 Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Compact Disk - Recordable		
CT/MR Studies on CD-R	Yes	Yes
General Purpose CD-R Image Interchange Profile	Yes	Yes
DVD		
CT/MR Studies on DVD Media	Yes	Yes
General Purpose DVD Interchange with JPEG	Yes	Yes
General Purpose DVD Interchange with JPEG 2000	Yes	Yes

1.1 Audience

This document is written for the people that need to understand how the Vitrea Workstation will integrate into their healthcare facility. This includes both those responsible for overall imaging network policy and architecture, as well as integrators who need to have a detailed understanding of the DICOM features of the product. This document contains some basic DICOM definitions so that any reader may understand how this product implements DICOM features. However, integrators are expected to fully understand all the DICOM terminology, how the tables in this document relate to the product's functionality, and how that functionality integrates with other devices that support compatible DICOM features. Also note that this document is formatted according to the DICOM 3.1 Specification, Part 2: Conformance.

TABLE OF CONTENTS

1	CONFORMANCE OVERVIEW	3
1.1	AUDIENCE	5
2	IMPLEMENTATION MODEL	14
2.1	APPLICATION DATA FLOW	14
2.2	FUNCTIONAL DEFINITION OF AE'S	15
2.2.1	<i>FIND-SCU</i>	15
2.2.2	<i>FIND-SCP</i>	15
2.2.3	<i>MOVE-SCU</i>	15
2.2.4	<i>MOVE-SCP</i>	15
2.2.5	<i>STORAGE-SCU</i>	15
2.2.6	<i>STORAGE-SCP</i>	15
2.2.7	<i>STORECOMMIT-SCU</i>	15
2.2.8	<i>PRINT-SCU</i>	15
2.3	SEQUENCING OF REAL-WORLD ACTIVITIES	16
3	AE SPECIFICATIONS.....	16
3.1	FIND-SCU	16
3.1.1	<i>SOP Classes</i>	16
3.1.2	<i>Association Policies</i>	16
3.1.2.1	General.....	16
3.1.2.2	Number of Associations	16
3.1.2.3	Asynchronous Nature.....	16
3.1.2.4	Implementation Identifying Information.....	16
3.1.3	<i>Association Initiation Policy</i>	16
3.1.3.1	Activity – Query Remote AE	16
3.1.3.1.1	Description and Sequencing of Activities.....	16
3.1.3.1.2	Proposed Presentation Contexts.....	17
3.1.3.1.2.1	Extended Negotiation.....	17
3.1.3.1.3	SOP Specific Conformance	17
3.1.3.1.3.1	SOP Specific Conformance to C-FIND SOP Classes.....	17
3.1.3.1.3.2	Presentation Context Acceptance Criterion.....	18
3.1.3.1.3.3	Transfer Syntax Selection Policies	18
3.1.3.1.3.4	Response Status.....	18
3.1.4	<i>Association Acceptance Policy</i>	19
3.2	FIND-SCP	19
3.2.1	<i>SOP Classes</i>	19
3.2.2	<i>Association Policies</i>	19
3.2.2.1	General.....	19
3.2.2.2	Number of Associations	19
3.2.2.3	Asynchronous Nature.....	19
3.2.2.4	Implementation Identifying Information.....	19
3.2.3	<i>Association Negotiation Policy</i>	20
3.2.4	<i>Association Acceptance Policy</i>	20
3.2.4.1	Activity – Receive Query Request	20
3.2.4.1.1	Description and Sequencing of Activities.....	20
3.2.4.1.2	Accepted Presentation Contexts	20
3.2.4.1.2.1	Extended Negotiation.....	20
3.2.4.1.3	SOP Specific Conformance	20
3.2.4.1.3.1	SOP Specific Conformance to C-FIND SOP Classes.....	20
3.2.4.1.3.2	Presentation Context Acceptance Criterion.....	21
3.2.4.1.3.3	Transfer Syntax Selection Policies	21
3.2.4.1.3.4	Response Status.....	21
3.3	MOVE-SCU	22

3.3.1	SOP Classes.....	22
3.3.2	Association Policies.....	22
3.3.2.1	General.....	22
3.3.2.2	Number of Associations.....	22
3.3.2.3	Asynchronous Nature.....	22
3.3.2.4	Implementation Identifying Information.....	23
3.3.3	Association Initiation Policy.....	23
3.3.3.1	Activity – Retrieve from Remote AE.....	23
3.3.3.1.1	Description and Sequencing of Activities.....	23
3.3.3.1.2	Proposed Presentation Contexts.....	23
3.3.3.1.2.1	Extended Negotiation.....	23
3.3.3.1.3	SOP Specific Conformance.....	23
3.3.3.1.3.1	SOP Specific Conformance to C-MOVE SOP Classes.....	23
3.3.3.1.3.2	Presentation Context Acceptance Criterion.....	24
3.3.3.1.3.3	Transfer Syntax Selection Policies.....	24
3.3.3.1.3.4	Response Status.....	24
3.3.3.1.3.5	Sub-operation dependent behavior.....	25
3.3.4	Association Acceptance Policy.....	25
3.4	MOVE-SCP.....	25
3.4.1	SOP Classes.....	25
3.4.2	Association Policies.....	25
3.4.2.1	General.....	25
3.4.2.2	Number of Associations.....	25
3.4.2.3	Asynchronous Nature.....	26
3.4.2.4	Implementation Identifying Information.....	26
3.4.3	Association Initiation Policy.....	26
3.4.4	Association Acceptance Policy.....	26
3.4.4.1	Activity – Retrieve Request from Remote AE.....	26
3.4.4.1.1	Description and Sequencing of Activities.....	26
3.4.4.1.2	Accepted Presentation Contexts.....	26
3.4.4.1.2.1	Extended Negotiation.....	26
3.4.4.1.3	SOP Specific Conformance.....	26
3.4.4.1.3.1	SOP Specific Conformance to C-MOVE SOP Classes.....	26
3.4.4.1.3.2	Presentation Context Acceptance Criterion.....	27
3.4.4.1.3.3	Transfer Syntax Selection Policies.....	27
3.4.4.1.3.4	Response Status.....	27
3.4.4.1.3.5	Sub-operation dependent behavior.....	28
3.5	STORAGE-SCU.....	28
3.5.1	SOP Classes.....	28
3.5.2	Association Policies.....	29
3.5.2.1	General.....	29
3.5.2.2	Number of Associations.....	29
3.5.2.3	Asynchronous Nature.....	29
3.5.2.4	Implementation Identifying Information.....	29
3.5.3	Association Initiation Policy.....	30
3.5.3.1	Activity – Request Storage.....	30
3.5.3.1.1	Description and Sequencing of Activities.....	30
3.5.3.1.2	Proposed Presentation Contexts.....	30
3.5.3.1.2.1	Extended Negotiation.....	31
3.5.3.1.3	SOP Specific Conformance.....	31
3.5.3.1.3.1	SOP Specific Conformance to Storage SOP Classes.....	31
3.5.3.1.3.2	Presentation Context Acceptance Criterion.....	31
3.5.3.1.3.3	Transfer Syntax Selection Policies.....	31
3.5.3.1.3.4	Response Status.....	31
3.5.4	Association Acceptance Policy.....	31
3.6	STORAGE-SCP.....	32
3.6.1	SOP Classes.....	32
3.6.2	Association Policies.....	33
3.6.2.1	General.....	33
3.6.2.2	Number of Associations.....	33

3.6.2.3	Asynchronous Nature.....	33
3.6.2.4	Implementation Identifying Information.....	33
3.6.3	<i>Association Initiation Policy</i>	33
3.6.4	<i>Association Acceptance Policy</i>	33
3.6.4.1	Activity – Receive Storage Request.....	33
3.6.4.1.1	Description and Sequencing of Activities.....	33
3.6.4.1.2	Accepted Presentation Contexts.....	34
3.6.4.1.2.1	Extended Negotiation.....	34
3.6.4.1.3	SOP Specific Conformance.....	34
3.6.4.1.3.1	SOP Specific Conformance to Storage SOP Classes.....	34
3.6.4.1.3.2	Presentation Context Acceptance Criterion.....	34
3.6.4.1.3.3	Transfer Syntax Selection Policies.....	34
3.6.4.1.3.4	Response Status.....	35
3.7	STORECOMMIT-SCU.....	35
3.7.1	<i>SOP Classes</i>	35
3.7.2	<i>Association Policies</i>	35
3.7.2.1	General.....	35
3.7.2.2	Number of Associations.....	35
3.7.2.3	Asynchronous Nature.....	36
3.7.2.4	Implementation Identifying Information.....	36
3.7.3	<i>Association Initiation Policy</i>	36
3.7.3.1	Activity – Request Storage Commitment.....	36
3.7.3.1.1	Description and Sequencing of Activities.....	36
3.7.3.1.2	Proposed Presentation Contexts.....	36
3.7.3.1.2.1	Extended Negotiation.....	36
3.7.3.1.3	SOP Specific Conformance.....	36
3.7.3.1.3.1	SOP Specific Conformance to STORAGE COMMITMENT SOP Classes.....	36
3.7.3.1.3.2	Transfer Syntax Selection Policies.....	37
3.7.3.1.3.3	Response Status.....	37
3.7.4	<i>Association Acceptance Policy</i>	37
3.7.4.1	Activity – Receive Results from Remote AE.....	37
3.7.4.1.1	Description and Sequencing of Activities.....	37
3.7.4.1.2	Proposed Presentation Contexts.....	37
3.7.4.1.2.1	Extended Negotiation.....	37
3.7.4.1.3	SOP Specific Conformance.....	37
3.7.4.1.3.1	SOP Specific Conformance to STORAGE COMMITMENT SOP Classes.....	37
3.7.4.1.3.2	Presentation Context Acceptance Criterion.....	38
3.7.4.1.3.3	Transfer Syntax Selection Policies.....	38
3.8	PRINT-SCU.....	38
3.8.1	<i>SOP Classes</i>	38
3.8.2	<i>Association Establishment Policy</i>	39
3.8.2.1	General.....	39
3.8.2.2	Number of Associations.....	39
3.8.2.3	Asynchronous Nature.....	39
3.8.2.4	Implementation Identifying Information.....	39
3.8.3	<i>Association Initiation Policy</i>	39
3.8.3.1	Activity – Request Print.....	39
3.8.3.1.1	Description and Sequencing of Activities.....	39
3.8.3.1.2	Proposed Presentation Contexts.....	39
3.8.3.1.3	SOP Specific Conformance.....	40
3.8.3.1.3.1	Specific Conformance to Basic Grayscale Print Management Meta SOP Class.....	40
3.8.3.1.3.1.1	Specific Conformance for Basic Film Session SOP Class.....	40
3.8.3.1.3.1.1.1	Basic Film Session SOP Class Operations for N-CREATE.....	40
3.8.3.1.3.1.1.2	Film Session SOP Class Operations for N-SET.....	41
3.8.3.1.3.1.1.3	Film Session SOP Class Operations for N-DELETE.....	42
3.8.3.1.3.1.1.4	Film Session SOP Class Operations for N-ACTION.....	42
3.8.3.1.3.1.2	Specific Conformance for Basic Film Box SOP Class.....	43
3.8.3.1.3.1.2.1	Basic Film Box SOP Class Operations for N-CREATE.....	43
3.8.3.1.3.1.2.2	Basic Film Box SOP Class Operations for N-SET.....	44
3.8.3.1.3.1.2.3	Basic Film Box SOP Class Operations for N-DELETE.....	45
3.8.3.1.3.1.2.4	Basic Film Box SOP Class Operations for N-Action.....	45

3.8.3.1.3.1.3	Specific Conformance for Image Box SOP Class.....	46
3.8.3.1.3.1.4	Specific Conformance for Printer SOP Class.....	47
3.8.3.1.3.2	Specific Conformance to Basic Color Print Management Meta SOP Class.....	47
3.8.3.1.3.2.1	Specific Conformance for Basic Film Session SOP Class.....	48
3.8.3.1.3.2.2	Specific Conformance for Basic Film Box SOP Class.....	48
3.8.3.1.3.2.3	Specific Conformance for Basic Color Image Box SOP Class.....	48
3.8.3.1.3.2.4	Specific Conformance for Printer SOP Class.....	49
4	NETWORK INTERFACES	49
4.1	PHYSICAL NETWORK INTERFACE	49
4.2	ADDITIONAL PROTOCOLS	49
5	CONFIGURATION	49
5.1	AE TITLE/PRESENTATION ADDRESS MAPPING.....	50
5.2	PARAMETERS.....	50
6	MEDIA INTERCHANGE	51
6.1	IMPLEMENTATION MODEL.....	51
6.1.1	<i>Application Data Flow</i>	51
6.1.2	<i>Functional Definitions of AE's</i>	51
6.1.2.1	MEDIA-FSR.....	51
6.1.2.2	MEDIA-FSC.....	51
6.1.3	<i>Sequencing of Real-World Activities</i>	51
6.2	AE SPECIFICATIONS	52
6.2.1	<i>MEDIA-FSR</i>	52
6.2.1.1	File Meta Information for the Application Entity	52
6.2.1.2	Real World Activities.....	52
6.2.1.2.1	Activity – Load Dataset.....	52
6.2.1.2.1.1	Application Profile Specific Conformance.....	52
6.2.2	<i>MEDIA-FSC</i>	52
6.2.2.1	File Meta Information for the Application Entity	52
6.2.2.2	Real World Activities.....	52
6.2.2.2.1	Activity – Create Media	52
6.2.2.2.1.1	Application Profile Specific Conformance.....	52
6.3	AUGMENTED AND PRIVATE PROFILES	53
6.3.1	<i>Augmented Profiles</i>	53
6.3.2	<i>Private Profiles</i>	53
6.4	MEDIA CONFIGURATION.....	53
7	SUPPORT OF CHARACTER SETS.....	53
8	SECURITY	53
9	IOD CONTENTS.....	54
9.1	CT IMAGE SOP INSTANCES	54
9.2	MR SOP INSTANCES	55
9.3	SECONDARY CAPTURE SOP INSTANCES	55
9.4	XA SOP INSTANCES.....	56
9.5	GRAYSCALE SOFTCOPY PRESENTATION STATE SOP INSTANCES	56
9.6	MODULES	57
9.6.1	<i>Common Modules</i>	57
9.6.1.1	Patient Module	57
9.6.1.2	Patient Study Module.....	57
9.6.1.3	General Study Module	57
9.6.1.4	General Equipment Module.....	58
9.6.1.5	General Series Module.....	58
9.6.1.6	General Image Module.....	58
9.6.1.7	Image Plane Module	58
9.6.1.8	Image Pixel Module.....	59

9.6.1.9	Contrast/Bolus Module	59
9.6.1.10	VOI LUT Module.....	59
9.6.1.11	Modality LUT Module	59
9.6.1.12	SOP Common Module.....	60
9.6.1.13	Frame of Reference Module	60
9.6.1.14	Secondary Capture Equipment Module	60
9.6.1.15	Secondary Capture Image Module.....	60
9.6.1.16	CT Image Module.....	60
9.6.1.17	MR Image Module.....	61
9.6.1.18	X-Ray Image Module	62
9.6.1.19	X-Ray Acquisition Module.....	62
9.6.1.20	XA Positioner Module.....	62
9.6.1.21	Presentation Series Module	62
9.6.1.22	Presentation State Identification Module.....	62
9.6.1.23	Presentation State Relationship Module	63
9.6.1.24	Displayed Area Module	63
9.6.1.25	Graphic Annotation Module	64
9.6.1.26	Spatial Transformation Module	64
9.6.1.27	Graphic Layer Module.....	65
9.6.1.28	Softcopy VOI LUT Module.....	65
9.6.1.29	Modality LUT Module	65
9.6.1.30	Softcopy Presentation LUT Module	65
9.6.1.31	Vital Images Private Module	65
10	DATA DICTIONARY OF PRIVATE ATTRIBUTES.....	66

TABLE OF TABLES AND FIGURES

Table 1-1	Network Services	3
Table 1-2	Media Services	4
Figure 2-1	Implementation Model.....	14
Table 3-1	SOP Classes Supported by FIND-SCU.....	16
Table 3-2	Maximum PDU Size Sent for FIND-SCU	16
Table 3-3	Number of Associations for FIND-SCU.....	16
Table 3-4	DICOM Implementation Class and Version for FIND-SCU	16
Table 3-5	Proposed Presentation Contexts for FIND-SCU and Query Remote AE.....	17
Table 3-6	Study Root Request Identifier for FIND-SCU	17
Table 3-7	Response Status for FIND-SCU and Query Remote AE Request	18
Table 3-8	SOP Classes Supported by FIND-SCP	19
Table 3-9	Maximum PDU Size Received for FIND-SCP.....	19
Table 3-10	Number of Associations for FIND-SCP	19
Table 3-11	DICOM Implementation Class and Version for FIND-SCP.....	19
Table 3-12	Accepted Presentation Contexts for FIND-SCP and Receive Query Request.....	20
Table 3-13	Study Root Request Identifier for FIND-SCP.....	20
Table 3-14	Response Status for FIND-SCP and Receive Query Request	21
Table 3-15	SOP Classes Supported by MOVE-SCU	22
Table 3-16	Maximum PDU Size Sent for MOVE-SCU	22
Table 3-17	Number of Associations for MOVE-SCU	22
Table 3-18	DICOM Implementation Class and Version for MOVE-SCU	23
Table 3-19	Proposed Presentation Contexts for MOVE-SCU and Retrieve from Remote AE.....	23
Table 3-20	Study Root Request Identifier for MOVE-SCU.....	23
Table 3-21	Response Status for MOVE-SCU and Retrieve from Remote AE Request.....	24
Table 3-22	SOP Classes Supported by MOVE-SCP.....	25
Table 3-23	Maximum PDU Size Received for MOVE-SCP	25
Table 3-24	Number of Associations for MOVE-SCP	25
Table 3-25	DICOM Implementation Class and Version for MOVE-SCP.....	26
Table 3-26	Accepted Presentation Contexts for MOVE-SCP and Retrieve Request from Remote AE.....	26

Table 3-27 Study Root Request Identifier for MOVE-SCP	27
Table 3-28 Response Status for MOVE-SCP and Retrieve Request from Remote AE	27
Table 3-29 SOP Classes Supported by STORAGE-SCU	28
Table 3-30 Maximum PDU Size Sent for STORAGE-SCU	29
Table 3-31 Number of Associations for STORAGE-SCU	29
Table 3-32 DICOM Implementation Class and Version for STORAGE-SCU	29
Table 3-33 Proposed Presentation Contexts for STORAGE-SCU and Request Storage	30
Table 3-34 Response Status for STORAGE-SCU and Request Storage	31
Table 3-35 SOP Classes Supported by STORAGE-SCP	32
Table 3-36 Maximum PDU Size Received for STORAGE-SCP	33
Table 3-37 Number of Associations for STORAGE-SCP	33
Table 3-38 DICOM Implementation Class and Version for STORAGE-SCP	33
Table 3-39 Accepted Presentation Contexts for STORAGE-SCP and Receive Storage Request	34
Table 3-40 Response Status for STORAGE-SCP and Receive Storage Request	35
Table 3-41 SOP Classes Supported by STORECOMMIT-SCU	35
Table 3-42 Maximum PDU Size Sent for STORECOMMIT-SCU	35
Table 3-43 Number of Associations for STORECOMMIT-SCU	35
Table 3-44 DICOM Implementation Class and Version for STORECOMMIT-SCU	36
Table 3-45 Proposed Presentation Contexts for STORECOMMIT-SCU	36
Table 3-46 Storage Commitment N-ACTION Response Status Handling Behavior	37
Table 3-47 Accepted Presentation Contexts for STORECOMMIT-SCU	37
Table 3-48 Storage Commitment N-EVENT-REPORT Behavior	37
Table 3-49 Storage Commitment N-EVENT-REPORT Response Status Reasons	38
Table 3-50 SOP Classes for PRINT-SCU	39
Table 3-51 Number of Associations for PRINT-SCU	39
Table 3-52 DICOM Implementation Class and Version for PRINT-SCU	39
Table 3-53 Proposed Presentation Contexts for PRINT-SCU	39
Table 3-54 SOP Classes for Basic Grayscale Print management Meta SOP Class	40
Table 3-55 Basic Film Session SOP Class N-CREATE Request Attributes	40
Table 3-56 Film Session SOP Class N-CREATE Response Status Handling Reasons	40
Table 3-57 Film Session SOP Class N-SET Response Status Handling Reasons	41
Table 3-58 Film Session SOP Class N-DELETE Response Status Handling Reasons	42
Table 3-59 Film Session SOP Class N-ACTION Response Status Handling Reasons	42
Table 3-60 Basic Film Box SOP Class N-CREATE Request Attributes	43
Table 3-61 Film Box SOP Class N-CREATE Response Status Handling Behavior	43
Table 3-62 Basic Film Box SOP Class N-SET Request Attributes	44
Table 3-63 Film Box SOP Class N-SET Response Status Handling Behavior	44
Table 3-64 Film Box SOP Class N-DELETE Response Handling Behavior	45
Table 3-65 Film Box SOP Class N-ACTION Response Handling Behavior	45
Table 3-66 Image Box SOP Class N-SET Request Attributes	46
Table 3-67 Image Box SOP Class N-SET Response Status Handling Behavior	47
Table 3-68 SOP Classes for Basic Color Print Management Meta SOP Class	47
Table 3-69 Image Box SOP Class N-SET Request Attributes	48
Table 3-70 Image Box SOP Class N-SET Response Status Handling Behavior	49
Table 5-1 Configuration Parameters Table	50
Table 5-2 Default SOP Classes for Configured AEs	50
Table 5-3 Default Transfer Syntaxes for Configured AEs	51
Table 6-1 Application Profiles, Activities and Roles for MEDIA-FSR	52
Table 6-2 Application Profiles, Activities and Roles for MEDIA-FSC	52
Table 6-3 Allowed Compression Transfer Syntaxes for FSC	53
Table 9-1 IOD of Created CT SOP Instances	54
Table 9-2 IOD of Created MR SOP Instances	55
Table 9-3 IOD of Created Secondary Capture SOP Instances	55
Table 9-4 IOD of Created XA SOP Instances	56
Table 9-5 IOD of Created GSPS SOP Instances	56
Table 9-6 Patient Module of Created SOP Instances	57

Table 9-7 Patient Study Module of Created SOP Instances	57
Table 9-8 General Study Module of Created SOP Instances	57
Table 9-9 General Equipment Module of Created SOP Instances	58
Table 9-10 General Series Module of Created SOP Instances	58
Table 9-11 General Image Module of Created SOP Instances	58
Table 9-12 Image Plane Module of Created SOP Instances	58
Table 9-13 Image Pixel Module of Created SOP Instances.....	59
Table 9-14 Contrast/Bolus Module of Created SOP Instances	59
Table 9-15 VOI LUT Module of Created SOP Instances.....	59
Table 9-16 Modality LUT Module of Created SOP Instances.....	59
Table 9-17 SOP Common Module of Created SOP Instances	60
Table 9-18 Frame of Reference Module of Created SOP Instances	60
Table 9-19 Secondary Capture Equipment Module of Created SOP Instances.....	60
Table 9-20 Secondary Capture Image Module of Created SOP Instances	60
Table 9-21 CT Image Module of Created SOP Instances	60
Table 9-22 MR Image Module of Created SOP Instances	61
Table 9-23 X-Ray Image Module of Created SOP Instances.....	62
Table 9-24 X-Ray Acquisition Module of Created SOP Instances	62
Table 9-25 XA Positioner Module of Created SOP Instances.....	62
Table 9-26 Presentation Series Module of Created SOP Instances	62
Table 9-27 Presentation State Identification of Created SOP Instances.....	62
Table 9-28 Presentation State Relationship Module of Created SOP Instances	63
Table 9-29 Displayed Area Module of Created SOP Instances	63
Table 9-30 Graphic Annotation Module of Created SOP Instances	64
Table 9-31 Spatial Transformation Module of Created SOP Instances	64
Table 9-32 Graphic Layer Module of Created SOP Instances	65
Table 9-33 Softcopy VOI LUT Module of Created SOP Instances	65
Table 9-34 Modality LUT Module of Created SOP Instances.....	65
Table 9-35 Softcopy Presentation LUT Module of Created SOP Instances	65
Table 9-36 Vital Images Private Module of Created SOP Instances.....	65

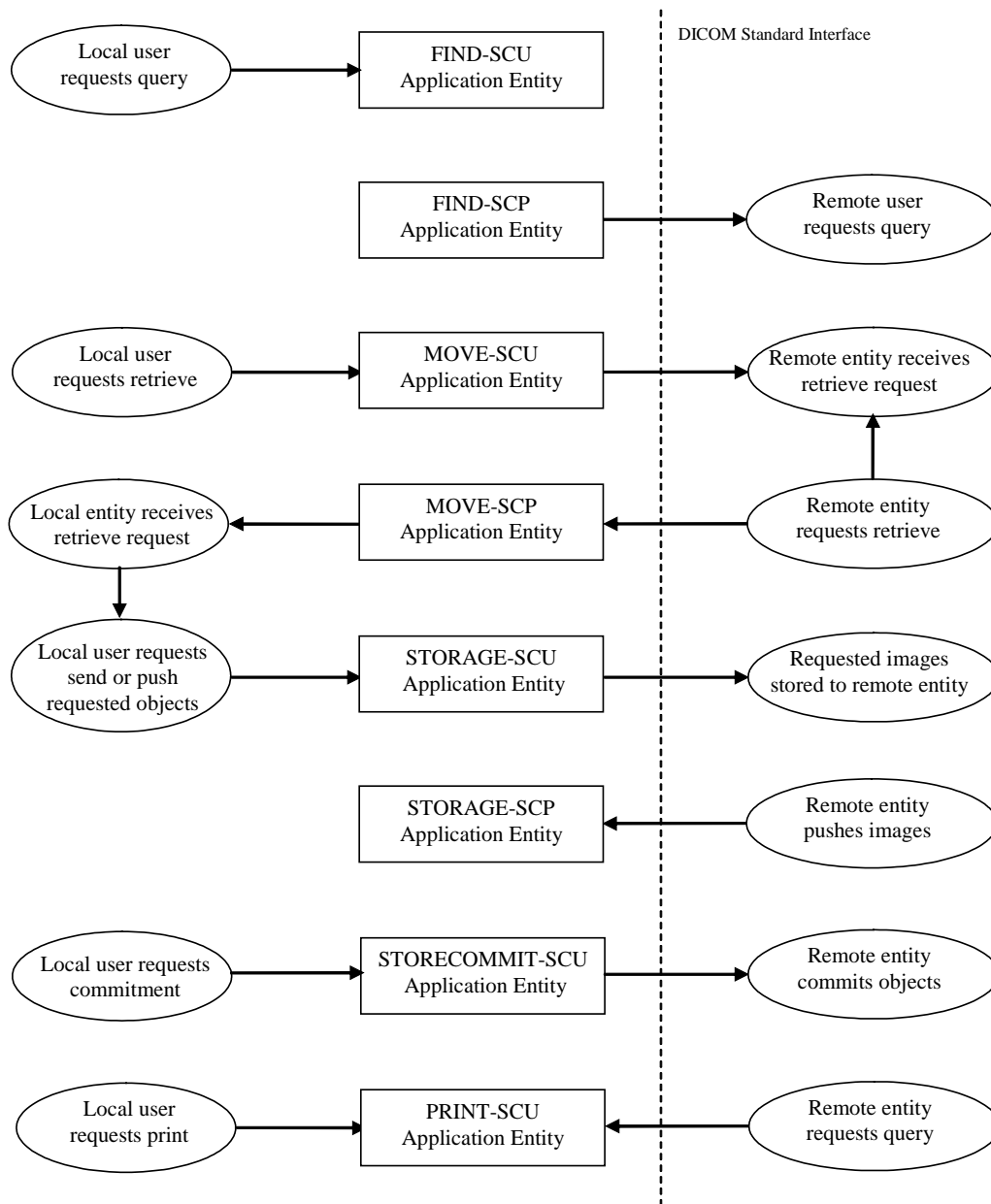
Revision History

REVISION	EFF Date	AUTHORS	CHANGES FROM PREVIOUS REVISION
A		Kelly Dupasquier	Content similar to other conformance statements, this document contents specific to Vitrea5.1 and fX3.0 conformance which differs from the previous release in the tags for the private module and private attributes (Table 1-3 and Data Dictionary of Private Attributes)
B	24-AUG-2011	Michael Chauss	Updated logo
C	18-OCT-2011	Michael Chauss	Updated product version.

2 Implementation Model

2.1 Application Data Flow

Figure 2-1 Implementation Model



The implementation consists of a set of applications which provide a user interface, internal database and network listeners that spawn additional threads or processes as necessary to handle incoming connections, as well as media support.

Conceptually the network services may be modeled as the following separate AEs, though in fact some AEs share (configurable) AE Titles:

- FIND-SCU, which queries remote entities for lists of studies, series and instances
- FIND-SCP, which processes queries from remote entities for lists of studies, series and instances
- MOVE-SCU, which retrieves studies, series and instances from remote entities
- MOVE-SCP, which processes retrieve requests from remote entities for studies, series and instances
- STORAGE-SCU, which stores images and other composite instances to remote entities
- STORAGE-SCP, which receives images and other composite instances from remote entities
- STORECOMMIT-SCU, which requests remote entities to commit instances that were sent from the STORAGE-SCU
- PRINT-SCU, which requests remote printer entities to print sets of images

2.2 Functional Definition of AE's

2.2.1 FIND-SCU

FIND-SCU is activated through the user interface when a user selects a remote AE to query (from a pre-configured list), then initiates a query. Queries are performed at the study level. A user can further expand each result in the query, which then initiates a series level query.

2.2.2 FIND-SCP

FIND-SCP waits in the background for connections, and will accept associations with Presentation Contexts for Study Root Query/Retrieve Model Service Class. It will query the local database based on the tags specified in the query, and send the appropriate responses to the requesting entity.

2.2.3 MOVE-SCU

MOVE-SCU is activated through the user interface when a user selects a study or series for retrieval. A connection to the remote AE is established to initiate and monitor the retrieval while the STORAGE-SCP AE receives the retrieved instances.

2.2.4 MOVE-SCP

MOVE-SCP waits in the background for connections, and will accept associations with Presentation Contexts for Study Root Query/Retrieve Model Service Class. It will query the local database for instances matching the tags specified, and send the instances to the requested remote entity via the STORAGE-SCU.

2.2.5 STORAGE-SCU

STORAGE-SCU is activated through the user interface when a user selects instances from the local database or media, or the currently displayed instance, and requests that they be sent to a remote AE (selected from a pre-configured list).

2.2.6 STORAGE-SCP

STORAGE-SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class and the Verification Service Class. It will store the received instances to the local database and request further processing, after which they are listened and viewed through the user interface.

2.2.7 STORECOMMIT-SCU

STORECOMMIT-SCU is activated automatically when the STORAGE-SCU has sent instances to a remote AE, and there is a STORECOMMIT-SCP configured for that entity. It requests the stored instances to be committed, then waits in the background for connections for the results of the commitment.

2.2.8 PRINT-SCU

PRINT-SCU is activated through the user interface when a user selects the currently displayed instance, and requests that it be printed by a remote AE (selected from a pre-configured list).

2.3 Sequencing of Real-World Activities

Not applicable.

3 AE Specifications

3.1 FIND-SCU

3.1.1 SOP Classes

FIND-SCU provide Standard Conformance to the following SOP Class(es):

Table 3-1 SOP Classes Supported by FIND-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Yes	No

3.1.2 Association Policies

3.1.2.1 General

FIND-SCU accepts, but never initiates associations.

Table 3-2 Maximum PDU Size Sent for FIND-SCU

Maximum PDU size sent	Unlimited
-----------------------	-----------

3.1.2.2 Number of Associations

Table 3-3 Number of Associations for FIND-SCU

Maximum number of simultaneous associations	1
---	---

3.1.2.3 Asynchronous Nature

FIND-SCU will only allow a single outstanding operation on an Association. Therefore, FIND-SCU will not perform asynchronous operations window negotiation.

3.1.2.4 Implementation Identifying Information

Table 3-4 DICOM Implementation Class and Version for FIND-SCU

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.1.3 Association Initiation Policy

FIND-SCU attempts to initiate a new association when the user performs the query action from the user interface. Each query contains attributes from only a single level in the hierarchy.

3.1.3.1 Activity – Query Remote AE

3.1.3.1.1 Description and Sequencing of Activities

A single attempt will be made to query the remote AE. If the query fails, for whatever reason, no retry will be performed.

3.1.3.1.2 Proposed Presentation Contexts

Table 3-5 Proposed Presentation Contexts for FIND-SCU and Query Remote AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-1	See Table 3-1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

FIND-SCU will propose a single Presentation Context, specified in the above table.

3.1.3.1.2.1 Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

3.1.3.1.3 SOP Specific Conformance

3.1.3.1.3.1 SOP Specific Conformance to C-FIND SOP Classes

FIND-SCU provides standard conformance to the supported C-FIND SOP Classes. Only a single information model, Study Root, is supported. Queries are initiated at the STUDY and SERIES levels, according to the request generated by the user interface. CANCEL requests are issued when the total number of matches exceeds the configurable limit, to avoid overflow of data. Unexpected attributes returned in a C-FIND response (those not requested) are ignored. Requested return attributes not returned by the SCP are ignored. Non-matching responses returned by the SCP due to unsupported (hopefully optional) matching keys are not filtered locally by the FIND-SCU and thus will still be presented in the browser. Duplicate responses will replace existing entries in the display.

Table 3-6 Study Root Request Identifier for FIND-SCU

Name	Tag	Types of Matching
STUDY Level		
Study Date	(0008,0020)	S,*,U,R
Study Time	(0008,0030)	S,*,U,R
Accession Number	(0008,0050)	S,*,U
Modalities In Study	(0008,0061)	S,U
Referring Physician's Name	(0008,0090)	U
Study Description	(0008,1030)	U
Patient's Name	(0010,0010)	S,*,U
Patient's ID	(0010,0020)	S,*,U
Study Instance UID	(0020,000D)	UNIQUE
Study ID	(0020,0010)	U
Number of Study Related Instances	(0020,1208)	U
SERIES Level		
Series Date	(0008,0021)	U
Series Time	(0008,0031)	U
Modality	(0008,0060)	U
Series Description	(0008,103E)	U
Protocol	(0018,1030)	U

Series Instance UID	(0020,000E)	UNIQUE
Series Number	(0020,0011)	U
Number of Series Related Instances	(0020,1209)	U

Types of Matching:

- S Indicates the identifier attribute uses Single Value Matching
- R Indicates Range Matching
- * Indicates wildcard matching
- U Indicates Universal Matching
- UNIQUE Indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

3.1.3.1.3.2 Presentation Context Acceptance Criterion

FIND-SCU does not accept associations.

3.1.3.1.3.3 Transfer Syntax Selection Policies

FIND-SCU uses only Implicit Little Endian Transfer Syntax.

3.1.3.1.3.4 Response Status

FIND-SCU will behave as described in Table D.4.2-24 in response to the status returned in the C-FIND response command message(s).

Table 3-7 Response Status for FIND-SCU and Query Remote AE Request

Service Status	Further Meaning	Status Codes	Behavior
Refused	Out of Resources	A700	Current query is terminated; remaining queries continue
Error	Identifier does not match SOP Class	A900	Current query is terminated; remaining queries continue
	Unable to process	Cxxx	Current query is terminated; remaining queries continue
Cancel	Matching terminated due to Cancel request	FE00	Current query is terminated; remaining queries continue
Success	Matching is complete - No final Identifier is supplied	0000	Current query is finished; remaining queries continue
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier used to populate browser

	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier	FF01	Identifier used to populate browser
--	--	------	-------------------------------------

3.1.4 Association Acceptance Policy

FIND-SCU does not accept associations.

3.2 FIND-SCP

3.2.1 SOP Classes

FIND-SCP provide Standard Conformance to the following SOP Class(es):

Table 3-8 SOP Classes Supported by FIND-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes

3.2.2 Association Policies

3.2.2.1 General

FIND-SCP initiates but never accepts associations.

Table 3-9 Maximum PDU Size Received for FIND-SCP

Maximum PDU size received	Unlimited
---------------------------	-----------

3.2.2.2 Number of Associations

Table 3-10 Number of Associations for FIND-SCP

Maximum number of simultaneous associations	10
---	----

The maximum number of simultaneous associations includes the total number of FIND-SCP, STORE_SCP, MOVE-SCP and STORECOMMIT-SCU associations.

3.2.2.3 Asynchronous Nature

FIND-SCP will only allow a single outstanding operation on an Association. Therefore, FIND-SCP will not perform asynchronous operations window negotiation.

3.2.2.4 Implementation Identifying Information

Table 3-11 DICOM Implementation Class and Version for FIND-SCP

Implementation Class UID	1.2.840.113747.1.3.9
--------------------------	----------------------

Implementation Version Name	VI_DICOM_3.9
-----------------------------	--------------

3.2.3 Association Negotiation Policy

FIND-SCP does not initiate associations.

3.2.4 Association Acceptance Policy

When FIND-SCP accepts an association, it will process query requests. If the Called AE Title does not match the pre-configured AE Title for the FIND-SCP, the association will be rejected.

3.2.4.1 Activity – Receive Query Request

3.2.4.1.1 Description and Sequencing of Activities

All queries are matched against records in the database.

3.2.4.1.2 Accepted Presentation Contexts

Table 3-12 Accepted Presentation Contexts for FIND-SCP and Receive Query Request

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-8	See Table 1-1Table 3-8	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

FIND-SCP will accept a single Presentation Context, specified in the above table.

3.2.4.1.2.1 Extended Negotiation

No extended negotiation is performed. In particular, relational queries are not supported.

3.2.4.1.3 SOP Specific Conformance

3.2.4.1.3.1 SOP Specific Conformance to C-FIND SOP Classes

FIND-SCP provides standard conformance to the supported C-FIND SOP Classes. Only a single information model, Study Root, is supported. Queries may be initiated at the STUDY, SERIES or IMAGE levels. CANCEL requests may be issued at any time, which will terminate the current query. Unsupported attributes requested in a C-FIND request are ignored.

Table 3-13 Study Root Request Identifier for FIND-SCP

Name	Tag	Types of Matching
STUDY Level		
Study Date	(0008,0020)	S,*,U,R
Study Time	(0008,0030)	S,*,U,R
Accession Number	(0008,0050)	S,*,U
Modalities In Study	(0008,0061)	S,*,U
Referring Physician's Name	(0008,0090)	S,*,U
Study Description	(0008,1030)	S,*,U
Patient's Name	(0010,0010)	S,*,U

Patient's ID	(0010,0020)	S,*,U
Study Instance UID	(0020,000D)	UNIQUE
Study ID	(0020,0010)	S,*,U
Number of Study Related Instances	(0020,1208)	U
SERIES Level		
Series Date	(0008,0021)	S,*,U,R
Series Time	(0008,0031)	S,*,U,R
Modality	(0008,0060)	S,*,U
Series Description	(0008,103E)	S,*,U
Protocol	(0018,1030)	S,*,U
Series Instance UID	(0020,000E)	UNIQUE
Series Number	(0020,0011)	S,*,U
Number of Series Related Instances	(0020,1209)	U
IMAGE Level		
SOP Class UID	(0008,0016)	S,*,U
SOP Instance UID	(0008,0018)	UNIQUE
Instance Number	(0020,0013)	S,*,U

Types of Matching:

- S Indicates the identifier attribute uses Single Value Matching
- R Indicates Range Matching
- * Indicates wildcard matching
- U Indicates Universal Matching
- UNIQUE Indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

3.2.4.1.3.2 Presentation Context Acceptance Criterion

FIND-SCP accepts only a single presentation context.

3.2.4.1.3.3 Transfer Syntax Selection Policies

FIND-SCP uses only Implicit Little Endian Transfer Syntax.

3.2.4.1.3.4 Response Status

FIND-SCP will behave as described in Table D.4.2-24 in response to the status returned in the C-FIND response command message(s).

Table 3-14 Response Status for FIND-SCP and Receive Query Request

Service Status	Further Meaning	Status Codes	Behavior
Refused	Out of Resources	A700	Association limit reached
Error	Identifier does not match SOP Class	A900	Query keys are not valid
	Unable to process	Cxxx	Internal processing error
Cancel	Matching terminated due to Cancel request	FE00	Current query is terminated; remaining queries continue

Success	Matching is complete - No final Identifier is supplied	0000	Current query is finished; remaining queries continue
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	All query attributes are supported, matches continuing
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier	FF01	One or more query attributes are not supported, matches continuing

3.3 MOVE-SCU

3.3.1 SOP Classes

MOVE-SCU provide Standard Conformance to the following SOP Class(es):

Table 3-15 SOP Classes Supported by MOVE-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No

3.3.2 Association Policies

3.3.2.1 General

MOVE-SCU initiates but never accepts associations.

Table 3-16 Maximum PDU Size Sent for MOVE-SCU

Maximum PDU size Sent	Unlimited
-----------------------	-----------

3.3.2.2 Number of Associations

Table 3-17 Number of Associations for MOVE-SCU

Maximum number of simultaneous associations	1
---	---

3.3.2.3 Asynchronous Nature

MOVE-SCU will only allow a single outstanding operation on an Association. Therefore, MOVE-SCU will not perform asynchronous operations window negotiation.

3.3.2.4 Implementation Identifying Information

Table 3-18 DICOM Implementation Class and Version for MOVE-SCU

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.3.3 Association Initiation Policy

MOVE-SCU attempts to initiate a new association when the user performs the retrieve action from the user interface.

3.3.3.1 Activity – Retrieve from Remote AE

3.3.3.1.1 Description and Sequencing of Activities

For the entity (study or series) selected from the user interface to be retrieved, an attempt will be made to retrieve it from the selected remote AE. If the retrieve fails, for whatever reason, it will be retried up to 5 times.

3.3.3.1.2 Proposed Presentation Contexts

Table 3-19 Proposed Presentation Contexts for MOVE-SCU and Retrieve from Remote AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-15	See Table 3-15	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

MOVE-SCU will propose a single Presentation Context.

3.3.3.1.2.1 Extended Negotiation

No extended negotiation is performed. In particular, relational retrievals are not supported.

3.3.3.1.3 SOP Specific Conformance

3.3.3.1.3.1 SOP Specific Conformance to C-MOVE SOP Classes

MOVE-SCU provides standard conformance to the supported C-MOVE SOP Classes. Only a single information model, Study Root, is supported. Retrieval will be performed at the STUDY or SERIES level depending on what level of entity has been selected by the user in the browser. No CANCEL requests are ever issued.

The retrieval is performed from the AE that was specified in the Retrieve AE attribute returned from the query performed by FIND-SCU. The instances are retrieved to the current application's local database by specifying the destination as the AE Title of the STORE-SCP AE of the local application. This implies that the remote C-MOVE SCP must be preconfigured to determine the presentation address corresponding to the STORE-SCP AE. The STORE-SCP AE will accept storage requests addressed to it from anywhere, so no pre-configuration of the local application to accept from the remote AE is necessary (except in so far as it was necessary to configure FIND-SCU).

Table 3-20 Study Root Request Identifier for MOVE-SCU

Name	Tag	Unique, Matching or Return Key
STUDY level		
Study Instance UID	(0020,000D)	U
SERIES level		
Series Instance UID	(0020,000E)	U

3.3.3.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCU does not accept associations.

3.3.3.1.3.3 Transfer Syntax Selection Policies

MOVE-SCU uses only Implicit Little Endian Transfer Syntax.

3.3.3.1.3.4 Response Status

MOVE-SCU will behave as described in the Table below in response to the status returned in the C-MOVE response command message(s).

Table 3-21 Response Status for MOVE-SCU and Retrieve from Remote AE Request

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)	Retrieval is terminated; Retries will occur
	Out of Resources - Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is terminated; Retries will occur
	Move Destination unknown	A801	(0000,0902)	Retrieval is terminated; No retry will occur
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	Retrieval is terminated; No retry will occur
	Unable to process	Cxxx	(0000,0901) (0000,0902)	Retrieval is terminated; No retry will occur
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is terminated (should never occur, since cancels never issued)
Warning	Sub-operations Complete - One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)	Retrieval is terminated; Retry will occur
Success	Sub-operations Complete - No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is finished
Pending	Sub-operations are	FF00	(0000,1020)	Retrieval continues

	continuing		(0000,1021) (0000,1022) (0000,1023)	
--	------------	--	---	--

3.3.3.1.3.5 Sub-operation dependent behavior

Since the C-MOVE operation is dependent on completion of C-STORE sub-operations that are occurring on a separate association, the question of failure of operations on the other association(s) must be considered. MOVE-SCU completely ignores whatever activities are taking place in relation to the STORAGE-SCP AE that is receiving the retrieved instances. Once the C-MOVE has been initiated it runs to completion (or failure) as described in the C-MOVE response command message(s). There is no attempt by MOVE-SCU to confirm that instances have actually been successfully received or locally stored.

Whether or not completely or partially successfully retrievals are made available in the local database to the user is purely dependent on the success or failure of the C-STORE sub-operations, not on any explicit action by MOVE-SCU. If there are any failures that are recoverable, the retrieve will be retried up to 5 times.

If the association on which the C-MOVE was issued is aborted for any reason, whether or not the C-STORE sub-operations continue is dependent on the remote AE; the local STORAGE-SCP will continue to accept associations and storage operations regardless.

3.3.4 Association Acceptance Policy

MOVE-SCU does not accept associations.

3.4 MOVE-SCP

3.4.1 SOP Classes

MOVE-SCP provide Standard Conformance to the following SOP Class(es):

Table 3-22 SOP Classes Supported by MOVE-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	No

3.4.2 Association Policies

3.4.2.1 General

MOVE-SCP accepts but never initiates associations.

Table 3-23 Maximum PDU Size Received for MOVE-SCP

Maximum PDU size received	Unlimited
---------------------------	-----------

3.4.2.2 Number of Associations

Table 3-24 Number of Associations for MOVE-SCP

Maximum number of simultaneous associations	10
---	----

The maximum number of simultaneous associations includes the total number of FIND-SCP, STORE_SCP, MOVE-SCP and STORECOMMIT-SCU associations.

3.4.2.3 Asynchronous Nature

MOVE-SCP will only allow a single outstanding operation on an Association. Therefore, MOVE-SCP will not perform asynchronous operations window negotiation.

3.4.2.4 Implementation Identifying Information

Table 3-25 DICOM Implementation Class and Version for MOVE-SCP

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.4.3 Association Initiation Policy

MOVE-SCP does not initiate associations.

3.4.4 Association Acceptance Policy

When MOVE-SCP accepts an association, it will respond to retrieve requests. If the Called AE Title does not match the pre-configured AE Title for the RETRIEVE-SCP, the association will be rejected.

3.4.4.1 Activity – Retrieve Request from Remote AE

3.4.4.1.1 Description and Sequencing of Activities

When retrieve requests are received, the attributes specified in the request are used to query the database. The instances that match are sent in a package to STORAGE-SCU for sending to the requested destination.

3.4.4.1.2 Accepted Presentation Contexts

Table 3-26 Accepted Presentation Contexts for MOVE-SCP and Retrieve Request from Remote AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-22	See Table 3-22	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

MOVE-SCP will accept a single Presentation Context.

3.4.4.1.2.1 Extended Negotiation

No extended negotiation is performed. In particular, relational retrievals are not supported.

3.4.4.1.3 SOP Specific Conformance

3.4.4.1.3.1 SOP Specific Conformance to C-MOVE SOP Classes

MOVE-SCP provides standard conformance to the supported C-MOVE SOP Classes. Only a single information model, Study Root, is supported. Retrieval may be performed at the STUDY, SERIES or IMAGE level depending on what level of entity has been requested. CANCEL requests are not supported.

The retrieval is performed from the AE that was specified in the Retrieve AE attribute returned from the query performed by FIND-SCU. The instances are retrieved to the current application's local database by specifying the destination as the AE Title of the STORE-SCP AE of the local application. This implies that the remote C-MOVE SCP must be preconfigured to determine the presentation address corresponding to the STORE-SCP AE. The STORE-SCP AE will accept storage requests addressed to it from anywhere, so no pre-configuration of the local application to accept from the remote AE is necessary (except in so far as it was necessary to configure FIND-SCU).

Table 3-27 Study Root Request Identifier for MOVE-SCP

Name	Tag	Unique, Matching or Return Key
STUDY level		
Study Instance UID	(0020,000D)	U
SERIES level		
Series Instance UID	(0020,000E)	U
IMAGE level		
SOP Instance UID	(0008,0018)	U

3.4.4.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCP accepts only a single Presentation Context.

3.4.4.1.3.3 Transfer Syntax Selection Policies

MOVE-SCP accepts only Implicit Little Endian Transfer Syntax.

3.4.4.1.3.4 Response Status

MOVE-SCP will behave as described in the Table below in response to the status returned in the C-MOVE response command message(s).

Table 3-28 Response Status for MOVE-SCP and Retrieve Request from Remote AE

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)	Association limit reach; Retrieval is terminated;
	Out of Resources - Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Never used in a response
	Move Destination unknown	A801	(0000,0902)	Retrieval is terminated
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	Retrieval is terminated
	Unable to process	Cxxx	(0000,0901) (0000,0902)	Retrieval is terminated
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Never used since CANCEL is not supported
Warning	Sub-operations Complete - One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)	Retrieval is terminated

Success	Sub-operations Complete - No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is finished
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval continues

3.4.4.1.3.5 Sub-operation dependent behavior

Since the C-MOVE operation is dependent on completion of C-STORE sub-operations that are occurring on a separate association, the question of failure of operations on the other association(s) must be considered. Once the C-MOVE has been initiated it runs to completion (or failure) as described in the C-MOVE response command message(s). There is no attempt by MOVE-SCU to confirm that instances have actually been successfully received or locally stored. If the association on which the C-MOVE was issued is aborted for any reason, the C-STORE sub-operations are halted.

3.5 STORAGE-SCU

3.5.1 SOP Classes

STORAGE-SCU provide Standard Conformance to the following SOP Class(es):

Table 3-29 SOP Classes Supported by STORAGE-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	No
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	No
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	No
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	No
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	No
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	No
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	No

Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	No
Segmentation Image Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	No
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Yes	No
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	Yes	No
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	Yes	No
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	Yes	No
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	Yes	No
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No

3.5.2 Association Policies

3.5.2.1 General

STORAGE-SCU initiates, but never accepts associations.

Table 3-30 Maximum PDU Size Sent for STORAGE-SCU

Maximum PDU size sent	Unlimited
-----------------------	-----------

3.5.2.2 Number of Associations

Table 3-31 Number of Associations for STORAGE-SCU

Maximum number of simultaneous associations	1
---	---

3.5.2.3 Asynchronous Nature

STORAGE-SCU will only allow a single outstanding operation on an Association. Therefore, STORAGE-SCU will not perform asynchronous operations window negotiation.

3.5.2.4 Implementation Identifying Information

Table 3-32 DICOM Implementation Class and Version for STORAGE-SCU

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.5.3 Association Initiation Policy

STORAGE-SCU initiates a new association when the user performs an export action from the user interface.

3.5.3.1 Activity – Request Storage

3.5.3.1.1 Description and Sequencing of Activities

A user can select instances and request them to be sent to a pre-configured destination. Each request is forwarded to the job queue and processed individually.

STORAGE-SCU is invoked by the job control interface that is responsible for processing export tasks. The job consists of data describing the instances to be stored and the destination. An internal daemon process triggered by a job for a specific network destination initiates a C-STORE request to store instances. If the process successfully establishes an Association to a remote Application Entity, it will transfer each marked instance one after another via the open Association. Status of the transfer is reported through the job control interface. Only one job will be active at a time. If the C-STORE Response from the remote Application contains a status other than Success or Warning, the Association is aborted and the related Job is switched to a retry state. It will be retried automatically up to 5 times.

The Storage AE attempts to initiate a new Association in order to issue a C-STORE request. If the job contains multiple instances then multiple C-STORE requests will be issued over the same Association. If the Remote AE is configured to support Storage Commitment, a new task is initiated to request Storage Commitment.

3.5.3.1.2 Proposed Presentation Contexts

Table 3-33 Proposed Presentation Contexts for STORAGE-SCU and Request Storage

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-35	See Table 3-35	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8) (<i>Retired</i>)	1.2.840.10008.1.2.4.53	SCP	None
		JPEG Full Progression, Non-Hierarchical (Process 10 & 12) (<i>Retired</i>)	1.2.840.10008.1.2.4.55	SCP	None

	JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	SCP	None
	RLE Lossless	1.2.840.10008.1.2.5	SCP	None

3.5.3.1.2.1 Extended Negotiation

No extended negotiation is performed, though STORAGE-SCU

3.5.3.1.3 SOP Specific Conformance

3.5.3.1.3.1 SOP Specific Conformance to Storage SOP Classes

STORAGE-SCU provides standard conformance to the Storage Service Class.

3.5.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCU does not accept associations.

3.5.3.1.3.3 Transfer Syntax Selection Policies

STORAGE-SCU prefers JPEG Lossless transfer syntaxes. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- First encountered JPEG Lossless Transfer Syntax (including JPEG 2000 Lossless),
- First encountered Implicit Transfer Syntax.
- Default Transfer Syntax

3.5.3.1.3.4 Response Status

STORAGE-SCU will behave as described in the Table below when generating the C-STORE response command message.

Table 3-34 Response Status for STORAGE-SCU and Request Storage

Service Status	Further Meaning	Status Codes	Reason
Refused	Out of Resources	A7xx	Job set to Retry state
Error	Data Set does not match SOP Class	A9xx	Job set to Failed state
	Cannot understand	Cxxx	Job set to Retry state
Warning	Coercion of Data Elements	B000	Job set to Complete state
	Data Set does not match SOP Class	B007	Job set to Failed state
	Elements Discarded	B006	Job set to Complete state
Success		0000	Job set to Complete state

3.5.4 Association Acceptance Policy

STORAGE-SCU does not accept associations.

3.6 STORAGE-SCP

3.6.1 SOP Classes

STORAGE-SCP provide Standard Conformance to the following SOP Class(es):

Table 3-35 SOP Classes Supported by STORAGE-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	No	Yes
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	No	Yes
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	No	Yes
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	No	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	No	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	No	Yes
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	No	Yes
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	No	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	No	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	No	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	No	Yes
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	No	Yes
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	No	Yes
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	No	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	No	Yes
Segmentation Image Storage	1.2.840.10008.5.1.4.1.1.66.4	No	Yes
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	No	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	No	Yes
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	No	Yes
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	No	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	No	Yes

VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	No	Yes
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	No	Yes
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	No	Yes
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	No	Yes
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	No	Yes
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	No	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	No	Yes

3.6.2 Association Policies

3.6.2.1 General

STORAGE-SCP accepts but never initiates associations.

Table 3-36 Maximum PDU Size Received for STORAGE-SCP

Maximum PDU size received	Unlimited
---------------------------	-----------

3.6.2.2 Number of Associations

Table 3-37 Number of Associations for STORAGE-SCP

Maximum number of simultaneous associations	10
---	----

The maximum number of simultaneous associations includes the total number of FIND-SCP, STORE_SCP, MOVE-SCP and STORECOMMIT-SCU associations.

3.6.2.3 Asynchronous Nature

STORAGE-SCP will only allow a single outstanding operation on an Association. Therefore, STORAGE-SCP will not perform asynchronous operations window negotiation.

3.6.2.4 Implementation Identifying Information

Table 3-38 DICOM Implementation Class and Version for STORAGE-SCP

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.6.3 Association Initiation Policy

STORAGE-SCP does not initiate associations.

3.6.4 Association Acceptance Policy

When STORAGE-SCP accepts an association, it will respond to storage requests. If the Called AE Title does not match the pre-configured AE Title for the STORAGE-SCP, the association will be rejected.

3.6.4.1 Activity – Receive Storage Request

3.6.4.1.1 Description and Sequencing of Activities

As instances are received they are copied to the local file system and a record inserted into the local database. If the received instance is a duplicate of a previously received instance, the old file and database record will be overwritten with the new one.

3.6.4.1.2 Accepted Presentation Contexts

Table 3-39 Accepted Presentation Contexts for STORAGE-SCP and Receive Storage Request

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-35	See Table 3-35	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70	SCP	None
		JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	SCP	None
		JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8) (<i>Retired</i>)	1.2.840.10008.1.2.4.53	SCP	None
		JPEG Full Progression, Non-Hierarchical (Process 10 & 12) (<i>Retired</i>)	1.2.840.10008.1.2.4.55	SCP	None
		JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

3.6.4.1.2.1 Extended Negotiation

No extended negotiation is performed, though STORAGE-SCP:

- Is a Level 2 Storage SCP (Full – does not discard any data elements)
- Does not support digital signatures
- Does not coerce any received data elements

3.6.4.1.3 SOP Specific Conformance

3.6.4.1.3.1 SOP Specific Conformance to Storage SOP Classes

STORAGE-SCP provides standard conformance to the Storage Service Class. STORAGE-SCP does not support Grayscale Softcopy Presentation State as required by Enhanced CT Image Storage and Enhanced MR Image Storage.

3.6.4.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCP will always accept any Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported, whether or not it is the same as another Presentation Context.

3.6.4.1.3.3 Transfer Syntax Selection Policies

STORAGE-SCP prefers JPEG Lossless Transfer Syntaxes. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- First encountered JPEG Lossless Transfer Syntax (including JPEG 2000 Lossless),
- First encountered Implicit Transfer Syntax.
- Default Transfer Syntax

STORAGE-SCP will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting a Transfer Syntax for each.

3.6.4.1.3.4 Response Status

STORAGE-SCP will behave as described in the Table below when generating the C-STORE response command message.

Table 3-40 Response Status for STORAGE-SCP and Receive Storage Request

Service Status	Further Meaning	Status Codes	Reason
Refused	Out of Resources	A7xx	Association limit reached
Error	Data Set does not match SOP Class	A9xx	Never sent – data set is not checked prior to storage
	Cannot understand	Cxxx	Internal processing error
Warning	Coercion of Data Elements	B000	Never sent - no coercion is ever performed
	Data Set does not match SOP Class	B007	Never sent - data set is not checked prior to storage
	Elements Discarded	B006	Never sent – all elements are always stored
Success		0000	

3.7 STORECOMMIT-SCU

3.7.1 SOP Classes

STORECOMMIT-SCU provide Standard Conformance to the following SOP Class(es):

Table 3-41 SOP Classes Supported by STORECOMMIT-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Storage Commitment Push Model	1.2.840.10008.5.1.20.1	Yes	No

3.7.2 Association Policies

3.7.2.1 General

STORECOMMIT-SCU initiates and accepts associations.

Table 3-42 Maximum PDU Size Sent for STORECOMMIT-SCU

Maximum PDU size sent	Unlimited
-----------------------	-----------

3.7.2.2 Number of Associations

Table 3-43 Number of Associations for STORECOMMIT-SCU

Maximum number of simultaneous associations	10
---	----

The maximum number of simultaneous associations includes the total number of FIND-SCP, STORE_SCP, MOVE-SCP and STORECOMMIT-SCU associations.

3.7.2.3 Asynchronous Nature

STORECOMMIT-SCU will only allow a single outstanding operation on an Association. Therefore, STORECOMMIT-SCU will not perform asynchronous operations window negotiation.

3.7.2.4 Implementation Identifying Information

Table 3-44 DICOM Implementation Class and Version for STORECOMMIT-SCU

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.7.3 Association Initiation Policy

STORECOMMIT-SCU attempts to initiate a new association when the user performs the export action from the user interface. STORECOMMIT-SCU is initiated once the requested instances have been sent to the remote entity.

3.7.3.1 Activity – Request Storage Commitment

3.7.3.1.1 Description and Sequencing of Activities

For the storage commitment entity related to the storage entity selected from the user interface, an attempt will be made to request Storage Commitment from the remote AE. If the request fails, for whatever reason, it will not be retried.

3.7.3.1.2 Proposed Presentation Contexts

Table 3-45 Proposed Presentation Contexts for STORECOMMIT-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-41	See Table 3-41	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

STORECOMMIT-SCU will propose a single Presentation Context.

3.7.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

3.7.3.1.3 SOP Specific Conformance

3.7.3.1.3.1 SOP Specific Conformance to STORAGE COMMITMENT SOP Classes

STORECOMMIT-SCU will be activated by STORE-SCU if the selected storage entity has a configured storage commitment entity. STORECOMMIT-SCU will request storage commitment for instances of the CT Image Storage SOP Class, MR Image Storage SOP Class, Secondary Capture Image Storage SOP Class and Grayscale Softcopy Presentation State Storage SOP Class. The Storage AE will consider Storage Commitment failed if no N-EVENT-REPORT is received for a Transaction UID within 24 hours after receiving a successful N-ACTION response (duration of applicability for a Transaction UID). The Storage AE does not send the optional Storage Media FileSet ID & UID Attributes or the Referenced Study Component Sequence Attribute in the N-ACTION.

3.7.3.1.3.2 Transfer Syntax Selection Policies

STORECOMMIT-SCU uses only Implicit Little Endian Transfer Syntax.

3.7.3.1.3.3 Response Status

The behavior of Storage AE when encountering status codes in a N-ACTION response is summarized in the Table below:

Table 3-46 Storage Commitment N-ACTION Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The request for storage comment is considered successfully sent. A timer is started which will expire if no N-EVENT-REPORT for the Transaction UID is received within 24 hours.
*	*	Any other status code.	The Association is aborted using A-ABORT and the request for storage comment is marked as failed. The status meaning is logged.

3.7.4 Association Acceptance Policy

When STORECOMMIT-SCU accepts an association, it will receive storage commitment results. If the Called AE Title does not match the pre-configured AE Title for the STORECOMMIT-SCU, the association will be rejected.

3.7.4.1 Activity – Receive Results from Remote AE

3.7.4.1.1 Description and Sequencing of Activities

When storage commitment results are received, the successful instances are marked in the local database for future deletion. The failed instances are logged in the log files.

3.7.4.1.2 Proposed Presentation Contexts

Table 3-47 Accepted Presentation Contexts for STORECOMMIT-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 3-22	See Table 3-22	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

STORECOMMIT-SCU will accept a single Presentation Context.

3.7.4.1.2.1 Extended Negotiation

Extended negotiation is used to select the SCP/SCU role for STORECOMMIT-SCU. STORECOMMIT-SCU will only allow the SCU role.

3.7.4.1.3 SOP Specific Conformance

3.7.4.1.3.1 SOP Specific Conformance to STORAGE COMMITMENT SOP Classes

STORECOMMIT-SCU is capable of receiving an N-EVENT-REPORT notification if it has successfully negotiated a Presentation Context for the Storage Commitment Push Model (i.e. only associations established with archive devices). Upon receipt of an N-EVENT-REPORT the timer associated with the Transaction UID will be canceled. The behavior of STORECOMMIT-SCU when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below.

Table 3-48 Storage Commitment N-EVENT-REPORT Behavior

Event Type Name	Event Type ID	Behavior
Storage Commitment Request Successful	1	The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are marked within the database as available for automatic deletion. The conditions under which automatic deletion is initiated and the amount of space freed are site configurable. SOP Instances will not be deleted if they are marked with a lock flag.
Storage Commitment Request Complete – Failures Exist	2	The Referenced SOP Instances under Referenced SOP Sequence (0008,1199) are treated in the same way as in the success case (Event Type 1). The Referenced SOP Instances under Failed SOP Sequence (0008,1198) are marked within the database as failed. The Failure Reasons are logged. A job that failed storage commitment will not be automatically restarted.

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

Table 3-49 Storage Commitment N-EVENT-REPORT Response Status Reasons

Service Status	Further Meaning	Error Code	Reasons
Success	Success	0000	The storage commitment result has been successfully received.
Failure	Unrecognized Operation	0211H	The Transaction UID in the N-EVENT-REPORT request is not recognized (was never issued within an N-ACTION request).
Failure	Resource Limitation	0213H	The Transaction UID in the N-EVENT-REPORT request has expired (no N-EVENT-REPORT was received within a configurable time limit).
Failure	No Such Event Type	0113H	An invalid Event Type ID was supplied in the N-EVENT-REPORT request.
Failure	Processing Failure	0110H	An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902).
Failure	Invalid Argument Value	0115H	One or more SOP Instance UIDs with the Referenced SOP Sequence (0008,1199) or Failed SOP Sequence (0008,1198) was not included in the Storage Commitment Request associated with this Transaction UID. The unrecognized SOP Instance UIDs will be returned within the Event Information of the N-EVENT-REPORT response.

3.7.4.1.3.2 Presentation Context Acceptance Criterion

STORECOMMIT-SCU accepts only a single Presentation Context.

3.7.4.1.3.3 Transfer Syntax Selection Policies

STORECOMMIT-SCU accepts only Implicit Little Endian Transfer Syntax.

3.8 PRINT-SCU

3.8.1 SOP Classes

PRINT-SCU provides Standard Conformance to the following SOP Classes:

Table 3-50 SOP Classes for PRINT-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	Yes	No
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18	Yes	No

3.8.2 Association Establishment Policy

3.8.2.1 General

3.8.2.2 Number of Associations

Table 3-51 Number of Associations for PRINT-SCU

Maximum number of simultaneous associations	1
---	---

3.8.2.3 Asynchronous Nature

PRINT-SCU will only allow a single outstanding operation on an Association. Therefore, PRINT-SCU will not perform asynchronous operations window negotiation.

3.8.2.4 Implementation Identifying Information

Table 3-52 DICOM Implementation Class and Version for PRINT-SCU

Implementation Class UID	1.2.840.113747.1.3.9
Implementation Version Name	VI_DICOM_3.9

3.8.3 Association Initiation Policy

PRINT-SCU initiates a new association when the user performs a print action from the user interface.

3.8.3.1 Activity – Request Print

3.8.3.1.1 Description and Sequencing of Activities

A user can select images and request them to be printed to a pre-configured print server. Each request is forwarded to a job queue and processed individually. Only one print job may be active at a time, but any number of jobs may be in the queue, and are serviced on a first-come, first-serve basis. Each print job results in a separate association, but each print job may contain multiple film boxes. If a print job is not successful, it will be marked as failed and will be retried up to 5 times.

3.8.3.1.2 Proposed Presentation Contexts

EXAMPLE-PRINT-SERVER-MANAGEMENT will accept Presentation Contexts as shown in the following table:

Table 3-53 Proposed Presentation Contexts for PRINT-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Table 3-50	See Table 3-50	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.8.3.1.3 SOP Specific Conformance

3.8.3.1.3.1 Specific Conformance to Basic Grayscale Print Management Meta SOP Class

PRINT-SCU supports the following mandatory SOP classes as defined by the Basic Grayscale Print Management Meta SOP Class:

Table 3-54 SOP Classes for Basic Grayscale Print management Meta SOP Class

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	Yes	No
Basic Film Box	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4	Yes	No
Printer	1.2.840.10008.5.1.1.16	Yes	No

The specific SOP Conformance statement for each of the Basic Grayscale Print Management Meta SOP Class components is described in the subsequent sections.

3.8.3.1.3.1.1 Specific Conformance for Basic Film Session SOP Class

PRINT-SCU provides support for the following DIMSE Services:

- N-CREATE
- N-SET
- N-ACTION
- N-DELETE

3.8.3.1.3.1.1.1 Basic Film Session SOP Class Operations for N-CREATE

The EXAMPLE-PRINT-SERVER-MANAGEMENT provides the following support for the Film Session attributes sent by the N-CREATE DIMSE service:

Table 3-55 Basic Film Session SOP Class N-CREATE Request Attributes

Attribute	Tag	Valid Range	Default Value
Number of Copies	(2000,0010)	1 – 99	1
Print Priority	(2000,0020)	LOW MED HIGH	LOW
Medium Type	(2000,0030)	CLEAR FILM BLUE FILM PAPER STORED PRINT	Current configured setting
Film Destination	(2000,0040)	MAGAZINE PROCESSOR STORED PRINT	Current configured setting
Film Session Label	(2000,0050)	Any string	Empty String

PRINT-SCU will behave as described in the Table below when receiving the N-CREATE response command message.

Table 3-56 Film Session SOP Class N-CREATE Response Status Handling Reasons

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	The N-CREATE operation is successful.
Warning	Attribute Value Out of Range	0116	The N-CREATE operation is considered successful but the status meaning is logged.
Warning	Memory allocation not supported	B600	N-CREATE operation is considered successful, but the status meaning is logged.
Warning	Attribute List Error	0107	The N-CREATE operation is considered successful but the status meaning is logged
Failure	Invalid attribute value	0106	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Processing failure	0110	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Invalid object instance	0117	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Resource limitation	0213	The N-CREATE operation failed, and the print job is marked as failed.

3.8.3.1.3.1.1.2 Film Session SOP Class Operations for N-SET

PRINT-SCU provides the support for the Film Session attributes sent by the N-SET DIMSE service identically as it is described for the Film Session with N-CREATE, Table 3-55.

The Print Server Management behavior and specific status codes sent for the N-SET of a specific Film Session is described in the following table:

Table 3-57 Film Session SOP Class N-SET Response Status Handling Reasons

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	The N-SET operation is successful.
Warning	Attribute Value Out of Range	0116	The N-SET operation is considered successful
Warning	Attribute List Error	0107	The N-SET operation is considered successful
Warning	Memory allocation not supported	B600	The N-SET operation is considered successful
Failure	Invalid attribute value	0106	The N-SET operation failed, and the print job is marked as failed.
Failure	Processing failure	0110	The N-SET operation failed, and the print job is marked as failed.
Failure	Invalid object instance	0112	The N-SET operation failed, and the print job is marked as failed.

3.8.3.1.3.1.1.3 Film Session SOP Class Operations for N-DELETE

PRINT-SCU behavior and specific status codes sent for the N-DELETE of a specific Film Session is described in the following table:

Table 3-58 Film Session SOP Class N-DELETE Response Status Handling Reasons

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	The SCP has completed the operation successfully. Film session has been successfully deleted.
Failure	Unknown UID	0112	No such object instance: the instance UID given does not exist. The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged.

3.8.3.1.3.1.1.4 Film Session SOP Class Operations for N-ACTION

PRINT-SCU behavior and specific status codes sent for the N-ACTION of a specific Film Session is described in the following table:

Table 3-59 Film Session SOP Class N-ACTION Response Status Handling Reasons

Service Status	Further Meaning	Error Code	Reason
Success	Success	0000	N-ACTION operation is successful.
Warning	Empty film page	B602	N-ACTION operation is considered successful.
Warning	Image larger than Image Box	B604	N-ACTION operation is considered successful.
Warning	Image larger than Image Box	B609	N-ACTION operation is considered successful.
Warning	Image larger than Image Box	B60A	N-ACTION operation is considered successful.
Failure	Invalid object	0112	The N-ACTION operation failed, and the print job is marked as failed.
Failure	Invalid operation	0211	The N-ACTION operation failed, and the print job is marked as failed.
Failure	Processing failure	C600	The N-ACTION operation failed, and the print job is marked as failed.
Failure	OUT of Resources	C601	The N-ACTION operation failed, and the print job is marked as failed.
Failure	Wrong Image size	C603	The N-ACTION operation failed, and the print job is marked as failed.
Failure	Wrong Print Image size	C613	The N-ACTION operation failed, and the print job is marked as failed.

3.8.3.1.3.1.2 Specific Conformance for Basic Film Box SOP Class

PRINT-SCU provides support for the following DIMSE Services:

- N-CREATE
- N-SET
- N-ACTION
- N-DELETE

3.8.3.1.3.1.2.1 Basic Film Box SOP Class Operations for N-CREATE

PRINT-SCU provides the following support for the Film Box attributes sent by the N-CREATE DIMSE service.

Table 3-60 Basic Film Box SOP Class N-CREATE Request Attributes

Attribute	Tag	Valid Range	Default Value if not sent by SCU or invalid value received
Image Display Format	(2010,0010)	STANDARD\C,ROW\R1,R2,R3 COL\C1,C2,C3	Configurable
Film Orientation	(2010,0040)	PORTRAIT LANDSCAPE	Configurable
Film Size Id	(2010,0050)	8INX10IN 11INX14IN 14INX17IN	Configurable
Magnification Type	(2010,0060)	REPLICATE BILINEAR CUBIC NONE	Configurable
Max Density	(2010,0130)	170-350	Configurable
Smoothing Type	(2010,0080)	0-15, the value is laser specific.	Configurable
Border Density	(2010,0100)	WHITE BLACK	Configurable
Trim	(2010,0140)	YES NO	Configurable

PRINT-SCU behavior and specific status codes sent for the N-CREATE of a specific Film Box is described in the following table:

Table 3-61 Film Box SOP Class N-CREATE Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The N-CREATE operation is successful.
	Attribute Value		The N-CREATE operation is assumed to be successful.

Warning	Out of Range	0116	
Warning	Min/Max Density out-range	B605	The N-CREATE operation is assumed to be successful.
Failure	Invalid attribute value	0106	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Processing failure	0110	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Duplicate SOP instance	0111	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Invalid object instance	0117	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Missing attribute	0120	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Missing attribute value	0121	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Resource limitation	0213	The N-CREATE operation failed, and the print job is marked as failed.
Failure	Out of Print Job Sequence	C616	The N-CREATE operation failed, and the print job is marked as failed.

3.8.3.1.3.1.2.2 Basic Film Box SOP Class Operations for N-SET

PRINT-SCU provides the support for the following Film Box attributes sent by the N-SET DIMSE service:

Table 3-62 Basic Film Box SOP Class N-SET Request Attributes

Attribute	Tag	Valid Range	Default Value if not sent by SCU or invalid value received
Magnification Type	(2010,0060)	REPLICATE BILINEAR CUBIC NONE	Configurable
Max Density	(2010,0130)	170-350	Configurable
Smoothing Types	(2010,0080)	0-15, the value is laser specific.	Configurable
Border Density	(2010,0100)	WHITE BLACK	Configurable
Trim	(2010,0140)	YES NO	Configurable

PRINT-SCU behavior and specific status codes sent for the N-SET of a specific Film Box is described in the following table:

Table 3-63 Film Box SOP Class N-SET Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The N-SET operation is successful.
Warning	Illegal Attribute	0107	The N-SET operation is assumed to be successful.
Warning	Attribute out of range	0116	The N-SET operation is assumed to be successful.
Failure	Invalid attribute value	0106	The N-SET operation failed, and the print job is marked as failed.
Failure	Processing failure	0110	The N-SET operation failed, and the print job is marked as failed.
Failure	No object instance	0112	The N-SET operation failed, and the print job is marked as failed.
Failure	Missing attribute value	0121	The N-SET operation failed, and the print job is marked as failed.

3.8.3.1.3.1.2.3 Basic Film Box SOP Class Operations for N-DELETE

PRINT-SCU provides the support for deleting the last created Film Box.

The specific behavior and status codes sent for the N-DELETE of the last created Film Box is described in the following table:

Table 3-64 Film Box SOP Class N-DELETE Response Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The N-DELETE operation is successful.
Failure	Illegal UID	0112	The N-DELETE operation failed, and the print job is marked as failed.

3.8.3.1.3.1.2.4 Basic Film Box SOP Class Operations for N-Action

PRINT-SCU provides the support for submitting the print job for printing the specific Film Box. The Film BOX N-ACTION arguments are defined in the DICOM Standard PS 3.4, table H.4-8.

The specific behavior and status codes sent for the N-ACTION of the specific Film Box is described in the following table:

Table 3-65 Film Box SOP Class N-ACTION Response Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The N-ACTION operation is successful, and the film is accepted for printing.
Warning	Empty Film Page	B603	The N-ACTION operation is considered successful, but the empty page will not be printed.
Warning	Image larger than Image Box	B604	The N-ACTION operation is considered successful.
Warning	Image larger than Image Box	B609	The N-ACTION operation is considered successful.

Warning	Image larger than Image Box	B60A	The N-ACTION operation is considered successful.
Failure	Out of Resources	C602	The N-ACTION operation failed, and the print job is marked as failed.
Failure	Wrong Image size	C603	The N-ACTION operation failed, and the print job is marked as failed.
Failure	Wrong Print Image size	C613	The N-ACTION operation failed, and the print job is marked as failed.

3.8.3.1.3.1.3 Specific Conformance for Image Box SOP Class

PRINT-SCU provides the following support for the attributes contained in the N-SET DIMSE Service of the Basic Grayscale Image Box SOP Class:

Table 3-66 Image Box SOP Class N-SET Request Attributes

Attribute	Tag	Valid Range	Default Value if not sent by SCU or invalid value received
Image Position	(2020,0010)	1 - Max number of images for Display Format	Mandatory, no default.
Basic Grayscale Image Sequence	(2020,0110)	N/A	N/A
>Samples Per Pixel	(0028,0002)	1	Mandatory, no default.
>Photometric Interpretation	(0028,0004)	MONOCHROME1 MONOCHROME2	Mandatory, no default.
>Rows	(0028,0010)	1 – Maximum rows for film size	Mandatory, no default.
>Columns	(0028,0011)	1 – Maximum columns for film size.	Mandatory, no default.
>Pixel Aspect Ratio	(0028,0034)	Any pair of valid positive integers (1 to 215-1)	No default
>Bits Allocated	(0028,0100)	8 or 16	Mandatory, no default.
>Bits Stored	(0028,0101)	8 – 16	Mandatory, no default.
>High Bit	(0028,0102)	7-15	Mandatory, no default.
>Pixel Representation	(0028,0103)	0 = unsigned 1 = 2's Complement	Mandatory, no default.
Polarity	(2020,0020)	NORMAL REVERSE	NORMAL
Magnification Type	(2010,0060)	REPLICATE BILINEAR CUBIC NONE	Configurable

Smoothing Type	(2010,0080)	0-15, the value is laser specific.	Configurable
----------------	-------------	------------------------------------	--------------

PRINT-SCU behavior and specific status codes sent for the N-SET of a specific Image Box is described in the following table:

Table 3-67 Image Box SOP Class N-SET Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The N-SET operation is successful.
Warning	Attribute out of range	0116	The N-SET operation is considered successful.
Warning	Image larger than Image Box	B604	The N-SET operation is considered successful.
Warning	Image larger than Image Box	B609	The N-SET operation is considered successful.
Warning	Image larger than Image Box	B60A	The N-SET operation is considered successful.
Failure	No object instance	0112	The N-SET operation failed, and the print job is marked as failed.
Failure	Missing attributes	0120	The N-SET operation failed, and the print job is marked as failed.
Failure	Missing attribute value	0121	The N-SET operation failed, and the print job is marked as failed.
Failure	Image size doesn't match	C603	The N-SET operation failed, and the print job is marked as failed.
Failure	Out of Resources	C605	The N-SET operation failed, and the print job is marked as failed.

3.8.3.1.3.1.4 Specific Conformance for Printer SOP Class

PRINT-SCU never issues N-GET or N-EVENT-REPORT requests for the Printer SOP Class.

3.8.3.1.3.2 Specific Conformance to Basic Color Print Management Meta SOP Class

PRINT-SCU supports the following mandatory SOP classes as defined by the Basic Grayscale Print Management Meta SOP Class:

Table 3-68 SOP Classes for Basic Color Print Management Meta SOP Class

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session	1.2.840.10008.5.1.1.1	No	Yes
Basic Film Box	1.2.840.10008.5.1.1.2	No	Yes
Basic Color Image Box	1.2.840.10008.5.1.1.4.1	No	Yes
Printer	1.2.840.10008.5.1.1.16	No	Yes

The specific SOP Conformance statement for each of the Basic Color Print Management Meta SOP Class components is described in the subsequent sections.

3.8.3.1.3.2.1 Specific Conformance for Basic Film Session SOP Class

See Section 3.8.3.1.3.1.1.

3.8.3.1.3.2.2 Specific Conformance for Basic Film Box SOP Class

See Section 3.8.3.1.3.1.2

3.8.3.1.3.2.3 Specific Conformance for Basic Color Image Box SOP Class

PRINT-SCU provides the following support for the attributes contained in the N-SET DIMSE Service of the Basic Grayscale Image Box SOP Class:

Table 3-69 Image Box SOP Class N-SET Request Attributes

Attribute	Tag	Valid Range	Default Value if not sent by SCU or invalid value received
Image Position	(2020,0010)	1 - Max number of images for Display Format	Mandatory, no default.
Basic Grayscale Image Sequence	(2020,0110)	N/A	N/A
>Samples Per Pixel	(0028,0002)	3	Mandatory, no default.
>Photometric Interpretation	(0028,0004)	RGB	Mandatory, no default.
>Rows	(0028,0010)	1 – Maximum rows for film size	Mandatory, no default.
>Columns	(0028,0011)	1 – Maximum columns for film size.	Mandatory, no default.
>Pixel Aspect Ratio	(0028,0034)	Any pair of valid positive integers (1 to 215-1)	No default
>Bits Allocated	(0028,0100)	8 or 16	Mandatory, no default.
>Bits Stored	(0028,0101)	8 – 16	Mandatory, no default.
>High Bit	(0028,0102)	7-15	Mandatory, no default.
>Pixel Representation	(0028,0103)	0 = unsigned 1 = 2's Complement	Mandatory, no default.
Polarity	(2020,0020)	NORMAL REVERSE	NORMAL
Magnification Type	(2010,0060)	REPLICATE BILINEAR CUBIC NONE	Configurable
Smoothing Type	(2010,0080)	0-15, the value is laser specific.	Configurable

PRINT-SCU behavior and specific status codes sent for the N-SET of a specific Image Box is described in the following table:

Table 3-70 Image Box SOP Class N-SET Response Status Handling Behavior

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	The N-SET operation is successful.
Warning	Attribute out of range	0116	The N-SET operation is considered successful.
Warning	Image larger than Image Box	B604	The N-SET operation is considered successful.
Warning	Image larger than Image Box	B609	The N-SET operation is considered successful.
Warning	Image larger than Image Box	B60A	The N-SET operation is considered successful.
Failure	No object instance	0112	The N-SET operation failed, and the print job is marked as failed.
Failure	Missing attributes	0120	The N-SET operation failed, and the print job is marked as failed.
Failure	Missing attribute value	0121	The N-SET operation failed, and the print job is marked as failed.
Failure	Image size doesn't match	C603	The N-SET operation failed, and the print job is marked as failed.
Failure	Out of Resources	C605	The N-SET operation failed, and the print job is marked as failed.

3.8.3.1.3.2.4 Specific Conformance for Printer SOP Class

PRINT-SCU never issues N-GET or N-EVENT-REPORT requests for the Printer SOP Class.

4 Network Interfaces

4.1 Physical Network Interface

The application is indifferent to the physical medium over which TCP/IP executes; which is dependent on the underlying operating system and hardware.

4.2 Additional Protocols

When host names rather than IP addresses are used in the configuration properties to specify presentation addresses for remote AEs, the application is dependent on the name resolution mechanism of the underlying operating system.

5 Configuration

Configuration is performed through the use of an administration tool. Refer to the product documentation for specific details.

5.1 AE Title/Presentation Address Mapping

All SCU requests are performed using the “local” AE, with the exception of Storage Commitment. Each AE has an alias assigned to allow a user to easily distinguish AEs from each other. Aliases are configurable, and are generally human-readable strings. Presentation addresses (IP address and Port) are also configurable for all AEs.

5.2 Parameters

Table 5-1 Configuration Parameters Table

Parameter	Configurable	Default Value
General Parameters		
PDU Size	Yes	64kB
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	60 seconds
General DIMSE level time-out values	No	60 seconds
Time-out waiting for response to TCP/IP connect() request. (Low-level timeout)	No	60 seconds
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	60 seconds
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	60 seconds
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	None
AE Specific Parameters (all AEs)		
Size constraint in maximum object size	No	None
Maximum PDU size the AE can receive	No	Unlimited
Maximum PDU size the AE can send	No	Unlimited
AE specific DIMSE level time-out values	Yes	60 seconds
Number of simultaneous Associations by Service and/or SOP Class	Yes	10
SOP Class support	Yes	See Table 5-2
Transfer Syntax support	Yes	See Table 5-3
Storage Commitment AE	Yes	None
Supported DIMSE services	Yes	None

Table 5-2 Default SOP Classes for Configured AEs

SOP Class Name	SOP Class UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
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
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1

Table 5-3 Default Transfer Syntaxes for Configured AEs

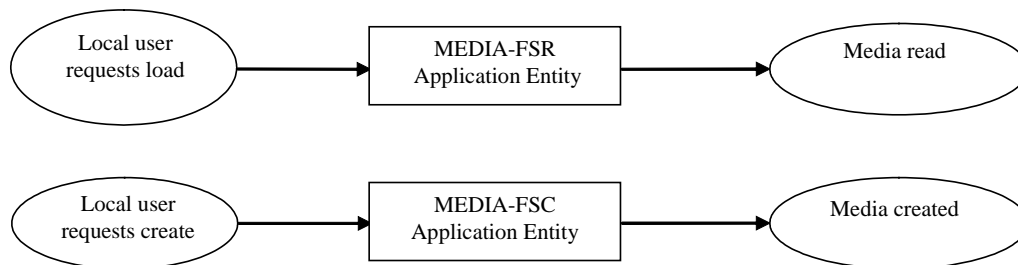
Transfer Syntax Name	Transfer Syntax UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1

6 MEDIA INTERCHANGE

6.1 Implementation Model

6.1.1 Application Data Flow

Figure 6-1 Implementation Model



The application provides a user interface and media support as a File Set Reader. Conceptually it may be modeled as the following single AE:

- MEDIA-FSR, which loads a user-selected PS 3.10 compliant file, which may be a DICOMDIR or an instance object, either from the local file system or from PS 3.12 compliant media according to one of the General Purpose Media Application Profiles of PS 3.11 (CD-R or DVD-RAM)
- MEDIA-FSC, which generates PS 3.12 compliant media according to one of the General Purpose Media Application Profiles of PS 3.11 (CD-R or DVD-RAM), consisting of PS 3.10 compliant files and DICOMDIR

6.1.2 Functional Definitions of AE's

6.1.2.1 MEDIA-FSR

MEDIA-FSR is activated through the user interface to select datasets for display, or to import into the local database.

6.1.2.2 MEDIA-FSC

MEDIA-FSC is activated through the user interface to select datasets for writing to the media.

6.1.3 Sequencing of Real-World Activities

All FSR and FSC activities are sequentially initiated in the user interface, and another activity may not be initiated until the prior activity has completed.

6.2 AE Specifications

6.2.1 MEDIA-FSR

MEDIA-FSR provides standard conformance to the Media Storage Service Class.

Table 6-1 Application Profiles, Activities and Roles for MEDIA-FSR

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Load dataset	FSR
STD-CTMR-CD	Load dataset	FSR
STD-CTMR-DVD	Load dataset	FSR
STD-GEN-DVD-JPEG	Load dataset	FSR
STD-GEN-DVD-J2K	Load dataset	FSR

6.2.1.1 File Meta Information for the Application Entity

Not applicable, since MEDIA-FSR is not an FSC or FSU.

6.2.1.2 Real World Activities

6.2.1.2.1 Activity – Load Dataset

MEDIA-FSR is activated through the user interface when a user selects the import or load operation. The import operation will cause the contents of the media to be imported into the local dataset. The load operation will cause the dataset to be loaded for display.

6.2.1.2.1.1 Application Profile Specific Conformance

There are no extensions or specializations.

6.2.2 MEDIA-FSC

MEDIA-FSC provides standard conformance to the Media Storage Service Class.

Table 6-2 Application Profiles, Activities and Roles for MEDIA-FSC

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Create media	FSC
STD-CTMR-CD	Create media	FSC
STD-CTMR-DVD	Create media	FSC
STD-GEN-DVD-JPEG	Create media	FSC
STD-GEN-DVD-J2K	Create media	FSC

6.2.2.1 File Meta Information for the Application Entity

The Source Application Entity Title included in the File Meta Header is configurable (see section 5).

6.2.2.2 Real World Activities

6.2.2.2.1 Activity – Create Media

MEDIA-FSC is activated through the user interface when a user selects the archive operation. This will cause the selected dataset to be created on the media.

6.2.2.2.1.1 Application Profile Specific Conformance

There are no extensions or specializations.

6.3 Augmented and Private Profiles

6.3.1 Augmented Profiles

None.

6.3.2 Private Profiles

None.

6.4 MEDIA Configuration

The usage of compression when creating media is configurable, and can be turned on or off. The specific compression Transfer Syntax to be used is also configurable, but must be one of the items in the following table:

Table 6-3 Allowed Compression Transfer Syntaxes for FSC

Transfer Syntax Name	Transfer Syntax UID
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction	1.2.840.10008.1.2.4.70
JPEG 2000 Image Compression (Lossless Only)	1.2.840.10008.1.2.4.90
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 &4)	1.2.840.10008.1.2.4.51
JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8) <i>(Retired)</i>	1.2.840.10008.1.2.4.53
JPEG Full Progression, Non-Hierarchical (Process 10 & 12) <i>(Retired)</i>	1.2.840.10008.1.2.4.55
JPEG 2000 Image Compression	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

7 Support of Character Sets

All Vital Images DICOM applications support ISO_IR 100 (ISO 8859-1:1987 Latin Alphabet No. 1 supplementary set). No other character sets are supported.

8 Security

Vital Images DICOM applications do not support any specific security measures. It is assumed the software is used within a secured environment. It is assumed that a secured environment includes at a minimum:

- Firewall or router protections to ensure that only approved external hosts have network access to the software
- Firewall or router protections to ensure that the software only has network access to approved external hosts and services.

- Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

9 IOD CONTENTS

The following sections specify the attributes used for the SOP Instances created by STORAGE-SCU. The following tables use a number of abbreviations. The abbreviations used in the “Presence of ...” column are:

VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present
ALWAYS	Always Present
EMPTY	Attribute is sent without a value

The abbreviations used in the “Source” column:

SRC	the attribute value source is from the original SOP Instance
USER	the attribute value source is from User input
CONFIG	the attribute value source is a configurable parameter
AUTO	the attribute is automatically generated

NOTE: All dates and times are encoded in the local configured calendar and time.

9.1 CT Image SOP Instances

See PS 3.3 A.3.1

Table 9-1 IOD of Created CT SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	9.6.1.1	ALWAYS
Study	General Study	9.6.1.3	ALWAYS
	Patient Study	9.6.1.2	ALWAYS
Series	General Series	9.6.1.5	ALWAYS
Frame of Reference	Frame of Reference	9.6.1.13	ALWAYS
Equipment	General Equipment	9.6.1.4	ALWAYS
Image	General Image	9.6.1.6	ALWAYS
	Image Plane	9.6.1.7	ALWAYS
	Image Pixel	9.6.1.8	ALWAYS
	Contrast/Bolus	9.6.1.9	Included if Contrast used in original images
	CT Image	9.6.1.16	ALWAYS
	SOP Common	9.6.1.12	ALWAYS
	Modality LUT	9.6.1.11	ALWAYS
	VOI LUT	9.6.1.10	ALWAYS
Vital Images Private	9.6.1.31	ALWAYS	

9.2 MR SOP Instances

See PS 3.3 A.4.1

Table 9-2 IOD of Created MR SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	9.6.1.1	ALWAYS
Study	General Study	9.6.1.3	ALWAYS
	Patient Study	9.6.1.2	ALWAYS
Series	General Series	9.6.1.5	ALWAYS
Frame of Reference	Frame of Reference	9.6.1.13	ALWAYS
Equipment	General Equipment	9.6.1.4	ALWAYS
Image	General Image	9.6.1.6	ALWAYS
	Image Pixel	9.6.1.7	ALWAYS
	Image Plane	9.6.1.8	ALWAYS
	Contrast/Bolus	9.6.1.9	Included if Contrast used in original images
	MR Image	9.6.1.17	ALWAYS
	VOI LUT	9.6.1.10	ALWAYS
	SOP Common	9.6.1.12	ALWAYS
	Vital Images Private	9.6.1.31	ALWAYS

9.3 Secondary Capture SOP Instances

See PS 3.3 A.8.1

Table 9-3 IOD of Created Secondary Capture SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	9.6.1.1	ALWAYS
Study	General Study	9.6.1.3	ALWAYS
	Patient Study	9.6.1.2	ALWAYS
Series	General Series	9.6.1.5	ALWAYS
Equipment	General Equipment	9.6.1.4	ALWAYS
	SC Equipment	9.6.1.14	ALWAYS
Image	General Image	9.6.1.6	ALWAYS
	Image Pixel	9.6.1.7	ALWAYS
	SC Image	9.6.1.15	ALWAYS
	SOP Common	9.6.1.12	ALWAYS
	Vital Images Private	9.6.1.31	ALWAYS

9.4 XA SOP Instances

See PS 3.3 A.14.1

Table 9-4 IOD of Created XA SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	9.6.1.1	ALWAYS
Study	General Study	9.6.1.3	ALWAYS
	Patient Study	9.6.1.2	ALWAYS
Series	General Series	9.6.1.5	ALWAYS
Frame of Reference	Frame of Reference	9.6.1.13	ALWAYS
Equipment	General Equipment	9.6.1.4	ALWAYS
Image	General Image	9.6.1.6	ALWAYS
	Image Pixel	9.6.1.7	ALWAYS
	X-Ray Image	9.6.1.18	ALWAYS
	X-Ray Acquisition	9.6.1.19	ALWAYS
	XA Positioner	9.6.1.20	ALWAYS
	SOP Common	9.6.1.12	ALWAYS
	Vital Images Private	9.6.1.31	ALWAYS

9.5 Grayscale Softcopy Presentation State SOP Instances

See PS 3.3 A.33.1

Table 9-5 IOD of Created GSPS SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	9.6.1.1	ALWAYS
Study	General Study	9.6.1.3	ALWAYS
	Patient Study	9.6.1.2	ALWAYS
Series	General Series	9.6.1.5	ALWAYS
	Presentation Series	9.6.1.21	ALWAYS
Frame of Reference	Frame of Reference	9.6.1.13	ALWAYS
Equipment	General Equipment	9.6.1.4	ALWAYS
Presentation State	Presentation State Identification	9.6.1.22	ALWAYS
	Presentation State Relationship	9.6.1.23	ALWAYS
	Displayed Area	9.6.1.24	ALWAYS
	Graphic Annotation	9.6.1.25	ALWAYS
	Spatial Transformation	9.6.1.26	ALWAYS
	Graphic Layer	9.6.1.27	ALWAYS
	Modality LUT	9.6.1.29	ALWAYS

	Softcopy VOI LUT	9.6.1.28	ALWAYS
	Softcopy Presentation LUT	9.6.1.30	ALWAYS
	SOP Common	9.6.1.12	ALWAYS

9.6 Modules

9.6.1 Common Modules

9.6.1.1 Patient Module

See DICOM PS 3.3 C.7.1.1 for more information.

Table 9-6 Patient Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN	From source instances	VNAP	SRC
Patient ID	(0010,0020)	LO	From source instances	VNAP	SRC
Patient's Birth Date	(0010,0030)	DA	From source instances	VNAP	SRC
Patient's Sex	(0010,0040)	CS	From source instances	VNAP	SRC

9.6.1.2 Patient Study Module

See DICOM PS 3.3 C.7.2.2 for more information

Table 9-7 Patient Study Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Age	(0010,1010)	AS	From source instances	VNAP	SRC

9.6.1.3 General Study Module

See DICOM PS 3.3 C.7.2.1 for more information.

Table 9-8 General Study Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Date	(0008,0020)	DA	From source instances	VNAP	SRC
Study Time	(0008,0030)	TM	From source instances	VNAP	SRC
Accession Number	(0008,0050)	SH	From source instances	VNAP	SRC
Referring Physician's Name	(0008,0090)	PN	From source instances	VNAP	SRC
Study Description	(0008,1030)	LO	From source instances	ANAP	SRC
Name of Physician(s) Reading Study	(0008,1060)	PN	From source instances	ANAP	SRC
Study Instance UID	(0020,000D)	UI	From source instances	ALWAYS	SRC
Study ID	(0020,0010)	SH	From source instances	VNAP	SRC

9.6.1.4 General Equipment Module

See DICOM PS 3.3 C.7.5.1

Table 9-9 General Equipment Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	"Vital Images, Inc"	ALWAYS	AUTO
Institution Name	(0008,0080)	LO	From source instances	VNAP	SRC
Institution Address	(0008,0081)	ST	From source instances	VNAP	SRC
Institution Department	(0008,1040)	LO	From source instances	VNAP	SRC
Manufacturer's Model Name	(0008,1090)	LO	"Vitrea 2"	ALWAYS	AUTO

9.6.1.5 General Series Module

See DICOM PS 3.3 C.7.3.1

Table 9-10 General Series Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	Based on IOD	ALWAYS	AUTO
Series Description	(0008,103E)	LO	Automatically Generated	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Automatically Generated	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Automatically Generated	ALWAYS	AUTO

9.6.1.6 General Image Module

See DICOM PS 3.3 C.7.6.1

Table 9-11 General Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS	Automatically Generated	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Automatically Generated	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Automatically Generated	ALWAYS	AUTO
Instance Number	(0020,0013)	IS	Automatically Generated	ALWAYS	AUTO
Burned In Annotation	(0028,0301)	CS	Automatically Generated	ANAP	AUTO

9.6.1.7 Image Plane Module

See DICOM PS 3.3 C.7.6.2

Table 9-12 Image Plane Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Slice Thickness	(0018,0050)	DS	Automatically Generated	ALWAYS	AUTO
Image Orientation (Patient)	(0020,0032)	DS	Automatically Generated	ALWAYS	AUTO
Image Position (Patient)	(0020,0037)	DS	Automatically Generated	ALWAYS	AUTO

Pixel Spacing	(0028,0030)	DS	Automatically Generated	ALWAYS	AUTO
---------------	-------------	----	-------------------------	--------	------

9.6.1.8 Image Pixel Module

See DICOM PS 3.3 C.7.6.3

Table 9-13 Image Pixel Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples Per Pixel	(0028,0002)	US	Automatically Generated	ANAP	AUTO
Planar Configuration	(0028,0006)	US	Automatically Generated	ANAP	AUTO
Rows	(0028,0010)	US	Automatically Generated	ALWAYS	AUTO
Columns	(0028,0011)	US	Automatically Generated	ALWAYS	AUTO
Pixel Aspect Ratio	(0028,0034)	IS	Automatically Generated	ANAP	AUTO
Bits Allocated	(0028,0100)	US	Automatically Generated	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	Automatically Generated	ALWAYS	AUTO
High Bit	(0028,0102)	US	Automatically Generated	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	Automatically Generated	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB/OW	Automatically Generated	ALWAYS	AUTO

9.6.1.9 Contrast/Bolus Module

See DICOM PS 3.3 C.7.6.4

Table 9-14 Contrast/Bolus Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Contrast/Bolus Agent	(0018,0010)	LO	From source instances	ANAP	SRC

9.6.1.10 VOI LUT Module

See DICOM PS 3.3 C.11.2

Table 9-15 VOI LUT Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	(0028,1050)	DS	Automatically Generated	ANAP	AUTO
Window Width	(0028,1051)	DS	Automatically Generated	ANAP	AUTO

9.6.1.11 Modality LUT Module

See DICOM PS 3.3 C.11.1

Table 9-16 Modality LUT Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Rescale Intercept	(0028,1052)	DS	Automatically Generated	ANAP	AUTO
Rescale Slope	(0028,1053)	DS	Automatically Generated	ANAP	AUTO
Rescale Type	(0028,1054)	LO	US	ANAP	AUTO

9.6.1.12 SOP Common Module

See DICOM PS 3.3 C.12.1

Table 9-17 SOP Common Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	Automatically Generated	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Automatically Generated	ALWAYS	AUTO

9.6.1.13 Frame of Reference Module

See DICOM PS 3.3 C.7.4.1

Table 9-18 Frame of Reference Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Frame of Reference UID	(0020,0052)	UI	From source instances	ALWAYS	SRC
Position Reference Indicator	(0020,1040)	LO	From source instances	VNAP	SRC

9.6.1.14 Secondary Capture Equipment Module

See DICOM PS 3.3 C.8.6.1

Table 9-19 Secondary Capture Equipment Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Conversion Type	(0008,0064)	CS	Automatically generated	ALWAYS	AUTO

9.6.1.15 Secondary Capture Image Module

See DICOM PS 3.3 C.8.6.2

Table 9-20 Secondary Capture Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Date of Secondary Capture	(0018,1012)	DA	Automatically generated	ALWAYS	AUTO
Time of Secondary Capture	(0018,1014)	TM	Automatically generated	ALWAYS	AUTO

9.6.1.16 CT Image Module

See DICOM PS 3.3 C.8.2.1

Table 9-21 CT Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	(0018,0060)	DS	From source instances	VNAP	SRC
Data Collection Diameter	(0018,0090)	DS	From source instances	ANAP	SRC
Reconstruction Diameter	(0018,1100)	DS	From source instances	ANAP	SRC

Gantry/Detector Tilt	(0018,1120)	DS	From source instances	ANAP	SRC
Table Height	(0018,1130)	DS	From source instances	ANAP	SRC
Rotation Direction	(0018,1140)	CS	From source instances	ANAP	SRC
Exposure Time	(0018,1150)	IS	From source instances	ANAP	SRC
X-Ray Tube Current	(0018,1151)	IS	From source instances	ANAP	SRC
Exposure	(0018,1152)	IS	From source instances	ANAP	SRC
Filter Type	(0018,1160)	SH	From source instances	ANAP	SRC
Generator Power	(0018,1170)	IS	From source instances	ANAP	SRC
Convolution Kernel	(0018,1210)	SH	From source instances	ANAP	SRC
Acquisition Number	(0020,0012)	IS	From source instances	VNAP	SRC

9.6.1.17 MR Image Module

See DICOM PS 3.3 C.8.3.1

Table 9-22 MR Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Scanning Sequence	(0018,0020)	CS	From source instances	ALWAYS	SRC
Sequence Variant	(0018,0021)	CS	From source instances	ALWAYS	SRC
Scan Options	(0018,0022)	CS	From source instances	VNAP	SRC
MR Acquisition Type	(0018,0023)	CS	From source instances	VNAP	SRC
Sequence Name	(0018,0024)	SH	From source instances	ANAP	SRC
Angio Flag	(0018,0025)	CS	From source instances	ANAP	SRC
Repetition Time	(0018,0080)	DS	From source instances	VNAP	SRC
Echo Time	(0018,0081)	DS	From source instances	VNAP	SRC
Inversion Time	(0018,0082)	DS	From source instances	VNAP	SRC
Number of Averages	(0018,0083)	DS	From source instances	ANAP	SRC
Imaging Frequency	(0018,0084)	DS	From source instances	ANAP	SRC
Imaged Nucleus	(0018,0085)	SH	From source instances	ANAP	SRC
Echo Number(s)	(0018,0086)	IS	From source instances	ANAP	SRC
Magnetic Field Strength	(0018,0087)	DS	From source instances	ANAP	SRC
Spacing Between Slices	(0018,0088)	DS	From source instances	ANAP	SRC
Number of Phase Encoding Steps	(0018,0089)	IS	From source instances	ANAP	SRC
Echo Train Length	(0018,0091)	IS	From source instances	VNAP	SRC
Reconstruction Diameter	(0018,1100)	DS	From source instances	ANAP	SRC
Receive Coil Name	(0018,1250)	SH	From source instances	ANAP	SRC
Transmit Coil Name	(0018,1251)	SH	From source instances	ANAP	SRC
In-Plane Phase Encoding Direction	(0018,1312)	CS	From source instances	ANAP	SRC

9.6.1.18 X-Ray Image Module

See DICOM PS 3.3 C.8.7.1

Table 9-23 X-Ray Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Pixel Intensity Relationship	(0028,1040)	CS	From source instances	ALWAYS	SRC

9.6.1.19 X-Ray Acquisition Module

See DICOM PS 3.3 C.8.7.2

Table 9-24 X-Ray Acquisition Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	(0018,0060)	DS	From source instances	ALWAYS	SRC
Exposure Time	(0018,1150)	IS	From source instances	ALWAYS	SRC
X-Ray Tube Current	(0018,1151)	IS	From source instances	ALWAYS	SRC
Exposure	(0018,1152)	IS	From source instances	ALWAYS	SRC
Radiation Setting	(0018,1155)	CS	From source instances	ALWAYS	SRC

9.6.1.20 XA Positioner Module

See DICOM PS 3.3 C.8.7.5

Table 9-25 XA Positioner Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Positioner Primary Angle	(0018,1510)	DS	Automatically generated	ALWAYS	AUTO
Positioner Secondary Angle	(0018,1511)	DS	Automatically generated	ALWAYS	AUTO

9.6.1.21 Presentation Series Module

See DICOM PS 3.3 C.11.9

Table 9-26 Presentation Series Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008.0060)	CS	PR	ALWAYS	SRC

9.6.1.22 Presentation State Identification Module

See DICOM PS 3.3 C.11.10

Table 9-27 Presentation State Identification of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Automatically generated	ALWAYS	AUTO
Content Label	(0070,0080)	CS	Automatically generated	ALWAYS	AUTO

Content Description	(0070,0081)	LO	Automatically generated	ALWAYS	AUTO
Presentation Creation Date	(0070,0082)	DA	Automatically generated	ALWAYS	AUTO
Presentation Creation Time	(0070,0083)	TM	Automatically generated	ALWAYS	AUTO
Content Creator's Name	(0070,0084)	PN	Vitrea 2	ALWAYS	AUTO

9.6.1.23 Presentation State Relationship Module

See DICOM PS 3.3 C.11.11

Table 9-28 Presentation State Relationship Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Referenced Series Sequence	(0008,1115)	SQ	N/A	ALWAYS	N/A
>Series Instance UID	(0020,000E)	UI	From source instances	ALWAYS	SRC
>Referenced Image Sequence	(0008,1140)	SQ	N/A	ALWAYS	N/A
>>Referenced SOP Class UID	(0008,1150)	UI	From source instances	ALWAYS	SRC
>>Referenced SOP Instance UID	(0008,1155)	UI	From source instances	ALWAYS	SRC

9.6.1.24 Displayed Area Module

See DICOM PS 3.3 C.10.4

Table 9-29 Displayed Area Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Displayed Area Selection Sequence	(0070,005A)	SQ	N/A	ALWAYS	N/A
>Referenced Image Sequence	(0008,1140)	SQ	N/A	ALWAYS	N/A
>>Referenced SOP Class UID	(0008,1150)	UI	From source instances	ALWAYS	SRC
>>Referenced SOP Instance UID	(0008,1155)	UI	From source instances	ALWAYS	SRC
>Displayed Area Top Left Hand Corner	(0070,0052)	SL	Automatically generated	ALWAYS	AUTO
>Displayed Area Bottom Right Hand Corner	(0070,0053)	SL	Automatically generated	ALWAYS	AUTO
>Presentation Size Mode	(0070,0100)	CS	Automatically generated	ALWAYS	AUTO
>Presentation Pixel Spacing	(0070,0101)	DS	Automatically generated	ALWAYS	AUTO
>Presentation Pixel Aspect Ratio	(0070,0102)	IS	Automatically generated	ALWAYS	AUTO

>Presentation Pixel Magnification Ratio	(0070,0103)	FL	Automatically generated	ALWAYS	AUTO
---	-------------	----	-------------------------	--------	------

9.6.1.25 Graphic Annotation Module

See DICOM PS 3.3 C.10.5

Table 9-30 Graphic Annotation Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Annotation Sequence	(0070,0001)	SQ	N/A	ALWAYS	N/A
>Referenced Image Sequence	(0008,1140)	SQ	N/A	ALWAYS	N/A
>>Referenced SOP Class UID	(0008,1150)	UI	From source instances	ALWAYS	SRC
>>Referenced SOP Instance UID	(0008,1155)	UI	From source instances	ALWAYS	SRC
>Graphic Layer	(0070,0002)	CS	Automatically generated	ALWAYS	AUTO
>Text Object Sequence	(0070,0008)	SQ	N/A	ALWAYS	N/A
>>Bounding Box Annotation Units	(0070,0003)	CS	Automatically generated	ANAP	AUTO
>>Anchor Point Annotation Unites	(0070,0004)	CS	Automatically generated	ANAP	AUTO
>>Graphic Annotation Units	(0070,0005)	CS	Automatically generated	ANAP	AUTO
>>Unformatted Text Value	(0070,0006)	ST	User generated	ALWAYS	USER
>Graphic Object Sequence	(0070,0009)	SQ	Automatically generated	ANAP	AUTO
>>Bounding Box Top Left Hand Corner	(0070,0010)	FL	Automatically generated	ANAP	AUTO
>>Bounding Box Bottom Right Hand Corner	(0070,0011)	FL	Automatically generated	ANAP	AUTO
>>Bounding Box Text Horizontal Justification	(0070,0012)	CS	Automatically generated	ANAP	AUTO
>>Anchor Point	(0070,0014)	FL	Automatically generated	ANAP	AUTO
>>Anchor Point Visibility	(0070,0015)	CS	Automatically generated	ANAP	AUTO
>>Graphic Dimensions	(0070,0020)	US	Automatically generated	ANAP	AUTO
>>Graphic Data	(0070,0022)	FL	Automatically generated	ANAP	AUTO
>>Graphic Type	(0070,0023)	CS	Automatically generated	ANAP	AUTO
>>Graphic Filled	(0070,0024)	CS	Automatically generated	ANAP	AUTO

9.6.1.26 Spatial Transformation Module

See DICOM PS 3.3 C.10.6

Table 9-31 Spatial Transformation Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Horizontal Flip	(0070,0041)	CS	Automatically generated	ALWAYS	AUTO
Image Rotation	(0070,0042)	US	Automatically generated	ALWAYS	AUTO

9.6.1.27 Graphic Layer Module

See DICOM PS 3.3 C.10.7

Table 9-32 Graphic Layer Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Graphic Layer Sequence	(0070,0060)	SQ	N/A	ALWAYS	N/A
>Graphic Layer	(0070,0002)	CS	Automatically generated	ALWAYS	AUTO
>Graphic Layer Order	(0070,0062)	IS	Automatically generated	ALWAYS	AUTO

9.6.1.28 Softcopy VOI LUT Module

See DICOM PS 3.3 C.11.8

Table 9-33 Softcopy VOI LUT Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Window Center	(0028,1050)	DS	Automatically generated	ALWAYS	AUTO
Window Width	(0028,1051)	DS	Automatically generated	ALWAYS	AUTO

9.6.1.29 Modality LUT Module

See DICOM PS 3.3 C.11.1

Table 9-34 Modality LUT Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Rescale Intercept	(0028,1052)	DS	Automatically generated	ALWAYS	AUTO
Rescale Slope	(0028,1053)	DS	Automatically generated	ALWAYS	AUTO
Rescale Type	(0028,1054)	LO	US	ALWAYS	AUTO

9.6.1.30 Softcopy Presentation LUT Module

See DICOM PS 3.3 C.11.6

Table 9-35 Softcopy Presentation LUT Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Presentation LUT Shape	(2050,0020)	CS	IDENTITY	ALWAYS	AUTO

9.6.1.31 Vital Images Private Module

Table 9-36 Vital Images Private Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Saved Workflow	(5653,xx10)	OB	Automatically Generated	ALWAYS	AUTO

Saved Workflow File Sequence	(5653,xx14)	SQ	Automatically Generated	ANAP	AUTO
>Saved Workflow File Name	(5653,xx11)	LO	Automatically Generated	ANAP	AUTO
>Saved Workflow File Data	(5653,xx12)	OB	Automatically Generated	ANAP	AUTO
>Saved Workflow File Length	(5653,xx13)	SL	Automatically Generated	ANAP	AUTO
Image Sequence	(5653,xx15)	SQ	Automatically Generated	ANAP	AUTO
>Image Orientation (Patient)	(0020,0032)	DS	Automatically Generated	ANAP	AUTO
>Image Position (Patient)	(0020,0037)	DS	Automatically Generated	ANAP	AUTO
Volume Interpolated Slices	(5653,xx16)	SL	Automatically Generated	ANAP	AUTO
Volume SOP Instance UID	(5653,xx17)	UI	Automatically Generated	ANAP	AUTO
Saved Workflow Type	(5653,xx18)	SH	Automatically Generated	ALWAYS	AUTO
Volume Study Instance UID	(5653,xx19)	UI	Automatically Generated	ANAP	AUTO
Volume Series Instance UID	(5653,xx22)	UI	Automatically Generated	ANAP	AUTO
Saved Workflow Code Meaning	(5653,xx23)	LO	Automatically Generated	ANAP	AUTO

10 Data Dictionary of Private Attributes

Tag	Attribute Name	VR	VM
(5653,00xx)	Private Creator	LO	1
(5653,xx10)	Saved Workflow	OB	1
(5653,xx11)	Saved Workflow File Name	LO	1
(5653,xx12)	Saved Workflow File Data	OB	1
(5653,xx13)	Saved Workflow File Length	SL	1
(5653,xx14)	Saved Workflow File Sequence	SQ	1
(5653,xx15)	Image Sequence	SQ	1
(5653,xx16)	Volume Interpolated Slices	SL	1
(5653,xx17)	Volume SOP Instance UID	UI	1
(5653,xx18)	Saved Workflow Type	SH	1
(5653,xx19)	Volume Study Instance UID	UI	1
(5653,xx20)	NumStudySwf	SL	1
(5653,xx21)	NumSeriesSwf	SL	1
(5653,xx22)	Volume Series Instance UID	UI	1
(5653,xx23)	Saved Workflow Code Meaning	LO	1