No. 2G985-043EN*A

DICOM CONFORMANCE STATEMENT

FOR

MEDICAL IMAGE PROCESSING WORKSTATION

Angio Workstation

MODEL XIDF-AWS801

V8.3 or later

CANON MEDICAL SYSTEMS CORPORATION

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Global: https://www.medical.canon/Interoperability/DICOM/EN
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1. CONFORMANCE STATEMENT OVERVIEW

The application supports image receives across the network from other systems for 2D and 3D viewing. The SOP Classes in table 1-1can be received and stored.

The application also supports the ability to query remote systems for a list of DICOM objects that may be retrieved. It also supports incoming queries from remote systems for a list of DICOM objects and the ability to retrieve them from the application. CT and Secondary Capture images can be generated and sent to remote systems.

The application acts as a Verification SOP Class SCU and SCP.

Table 1-1 Network Services

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Verification	Yes	Yes
CT Image Storage	Yes	Yes
Enhanced CT Image Storage	Yes (*)	Yes
MR Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	Yes (*)	Yes
X-Ray 3D Angiographic Image Storage	Yes	Yes
Basic Text SR Storage	Yes	Yes
Query/Retrieve		
Study Root Query/Retrieve Information Model – FIND	Yes	Yes
Study Root Query/Retrieve Information Model – MOVE	Yes	Yes

* Store without processing the structure that received as SCP.

Table 1-2 Media Services

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
DVD		
CT/MR Studies Image DVD media (*)	FSC Only	Yes

* DVD-R only

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3. INTRODUCTION

3.1 Revision History

Table 3-1 Revision History

REV.	Date of Issue	Author	Description
	Jul 2018	Canon Medical Systems	Initial Version
A	Jan2019	Canon Medical Systems	Add software version in front cover Update Value of tag (0008,0070)

3.2 Audience

This document is written for the people that need to understand how the Vitrea 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.

3.3 Remarks

The scope of this DICOM Conformance Statement is to facilitate integration between the Vitrea and other DICOM products. The Conformance Statement should be read and understood in conjunction with the DICOM Standard. DICOM by itself does not guarantee interoperability. The Conformance Statement does, however, facilitate a first-level comparison for interoperability between different applications supporting compatible DICOM functionality.

This Conformance Statement is not supposed to replace validation with other DICOM equipment to ensure proper exchange of intended information. In fact, the user should be aware of the following important issues:

- The comparison of different Conformance Statements is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.

- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

3.4 Terms and Definitions

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples: Verification SOP Class, Computed Tomography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an Application Entity, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between Application Entities. Example: DICOM network protocol.

Association – a network communication channel set up between Application Entities.

Digital Imaging and Communications in Medicine (DICOM) - DICOM is a global Information-Technology standard used in all hospitals worldwide.

Information Object Definition (IOD) – the specified set of Attributes that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The Attributes may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs).

Module – a set of Attributes within an Information Object Definition that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of Association establishment that allows Application Entities to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an Association, as negotiated between Application Entities; includes Abstract Syntaxes and Transfer Syntaxes.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an Application Entity to ensure confidentiality, integrity, and/or availability of exchanged DICOM data.

Service Class Provider (SCP) – role of an Application Entity that provides a DICOM network service; typically, a server that performs operations requested by another Application Entity (Service Class User). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP)

Service Class User (SCU) – role of an Application Entity that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU).

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Computed Tomography Image Storage Service, Basic Grayscale Print Management.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the “group” and the “element”. If the “group” number is odd, the tag is for a private (manufacturer-specific) data element. Examples: 0010,0020) [Patient ID], (07FE,0010) [Pixel Data].

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: JPEG compressed (images), little endian explicit value representation.

Unique Identifier (UID) – a globally unique “dotted decimal” string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person’s name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

3.5 Basics of DICOM Communication

This section describes terminology used in this Conformance Statement for the non-specialist. The key terms used in the Conformance Statement are highlighted in italics below. This section is not a substitute for training about DICOM, and it makes many simplifications about the meanings of DICOM terms.

Two Application Entities (devices) that want to communicate with each other over a network using DICOM protocol must first agree on several things during an initial network “handshake”. One of the two devices must initiate an Association (a connection to the other device), and ask if specific services, information, and encoding can be supported by the other device (Negotiation).

DICOM specifies a number of network services and types of information objects, each of which is called an Abstract Syntax for the Negotiation. DICOM also specifies a variety of methods for encoding data, denoted Transfer Syntaxes. The Negotiation allows the initiating Application Entity to propose combinations of Abstract Syntax and Transfer Syntax to be used on the Association; these combinations are called Presentation Contexts. The receiving Application Entity accepts the Presentation Contexts it supports.

For each Presentation Context, the Association Negotiation also allows the devices to agree on Roles – which one is the Service Class User (SCU - client) and which is the Service Class Provider (SCP - server). Normally the device initiating the connection is the SCU, i.e., the client system calls the server, but not always.

The Association Negotiation finally enables exchange of maximum network packet (PDU) size, security information, and network service options (called Extended Negotiation information).

The Application Entities, having negotiated the Association parameters, may now commence exchanging data. Common data exchanges include queries for worklists and lists of stored images, transfer of image objects and analyses (structured reports), and sending images to film printers. Each exchangeable unit of data is formatted by the sender in accordance with the appropriate Information Object Definition, and sent using the negotiated Transfer Syntax. There is a Default Transfer Syntax that all systems must accept, but it may not be the most efficient for some use cases. Each transfer is explicitly acknowledged by the receiver with a Response Status indicating success, failure, or that query or retrieve operations are still in process.

Two Application Entities may also communicate with each other by exchanging media (such as a CD-R). Since there is no Association Negotiation possible, they both use a Media Application Profile that specifies “pre-negotiated” exchange media format, Abstract Syntax, and Transfer Syntax.

3.6 Abbreviations

AE	Application Entity
AET	Application Entity Title
CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
IOD	Information Object Definition
JPEG	Joint Photographic Experts Group
MR	Magnetic Resonance Imaging
NM	Nuclear Medicine
PDU	Protocol Data Unit
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol
VR	Value Representation
XA	X-ray Angiography

3.7 References

NEMA PS3 DICOM Standard, available free at https://www.dicomstandard.org/

4. NETWORKING

4.1 Implementation Model

4.1.1 Application Data Flow

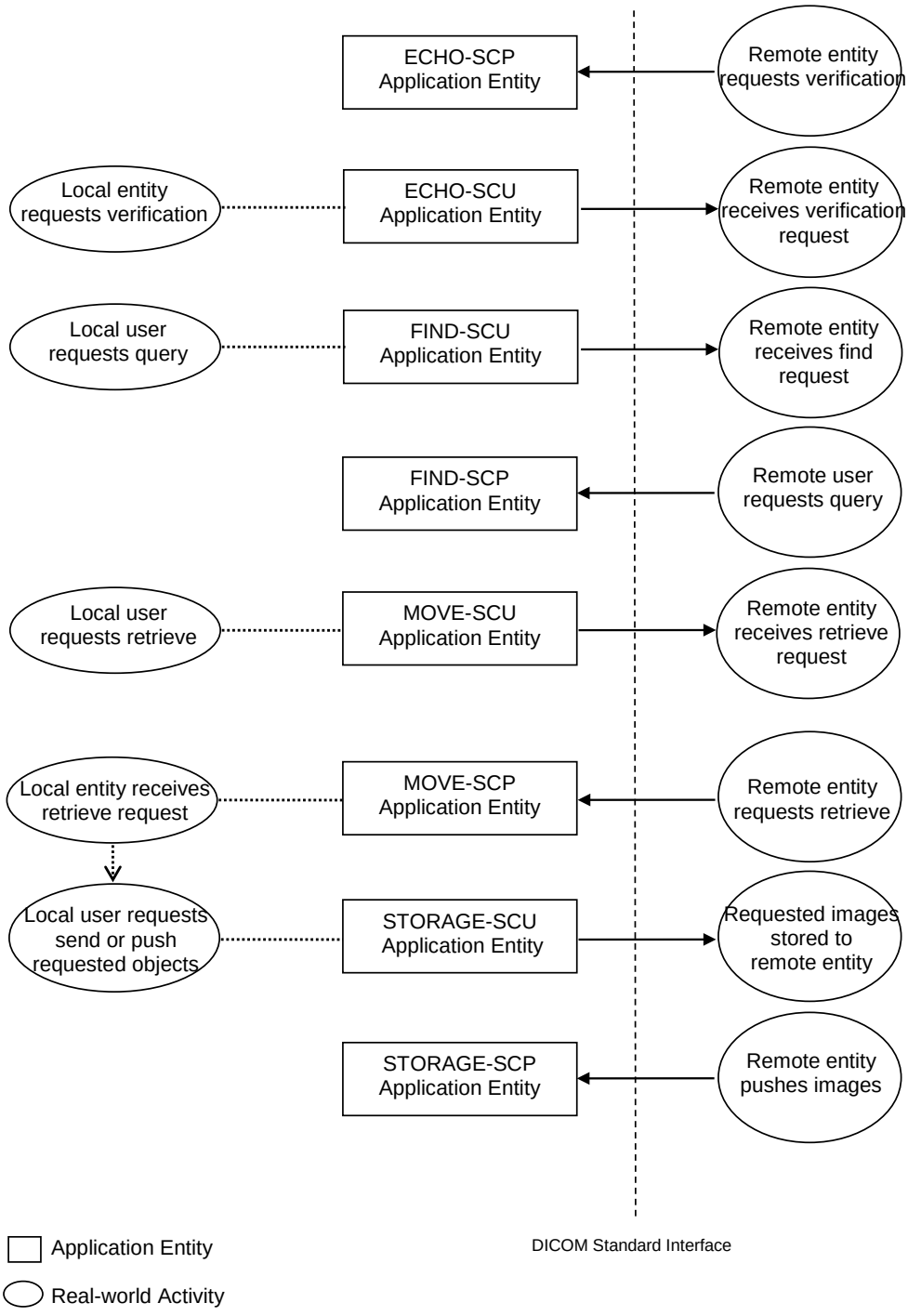

Figure 4.1 Implementation Model

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.

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

- ECHO-SCP, which responds to verification requests
- ECHO-SCU, which sends verification requests
- 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
-

4.1.2 Functional Definition of AE's

4.1.2.1 ECHO-SCP

ECHO-SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Class of the Verification Service Class, and will respond successfully to echo requests.

4.1.2.2 ECHO-SCU

ECHO-SCU is activated through the user interface when a user requests an echo to a remote AE. An echo is performed to that remote AE, verifying basic DICOM connectivity and displaying results.

4.1.2.3 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.

4.1.2.4 FIND-SCP

FIND-SCP continuously runs in the background, waiting for connections, and will accept associations from known IP addresses with Presentation Contexts for Study Root Query/Retrieve Model Service Class. It will query the permanent database based on the tags specified in the query, and send the appropriate responses to the requesting entity. A limit of 500 matching responses is currently imposed on the service. A configuration option for receiving from all IP addresses is available, by default only configured incoming connections are accepted.

4.1.2.5 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.

4.1.2.6 MOVE-SCP

MOVE-SCP continuously runs in the background, waiting 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.

4.1.2.7 STORAGE-SCU

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

4.1.2.8 STORAGE-SCP

STORAGE-SCP continuously runs in the background, waiting for connections and 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, complete preprocessing, and store the data to the local disk, after which they are listed and viewed through the user interface. A configuration option for receiving only from known IP addresses is available, by default all incoming connections are accepted. Any tags of type 1 (including all UIDs) which are missing, empty, or longer than the defined Standard value will be rejected.

4.1.3 Sequencing of Real-World Activities

4.1.3.1 DICOM Validation

4.1.3.1.1 Invalid Dicom Values

Within the system there is validation for DICOM tags. Any tags of type 1 (including all UIDs) which are missing, empty, or longer than the defined Standard value will be rejected at the time of SCP receive. These tags have been identified as possible patient hazards if incorrectly populated, therefore they will not be allowed into the system. Users should reconcile the non-conformant data if it is to be processed by the system.

4.1.3.1.2 Demographic Updates

STORAGE-SCP receives instances which may have changed demographic data. The new instances received replace the previously received specific instances. Demographic information in the system is updated to match the latest received instances and necessary volumes are regenerated.

New values for the following DICOM attributes can trigger a demographic update:

PATIENT
- (0010,0010) Patient's Name
- (0010,0020) Patient ID
- (0010,0030) Patient's Birth Date
- (0010,0032) Patient's Birth Time
- (0010,0040) Patient's Sex
- (0010,1000) Other Patient IDs
- (0010,1001) Other Patient Names
- (0010,1010) Patient's Age
- (0010,1020) Patient's Size
- (0010,1030) Patient's Weight
- (0010,2160) Ethnic Group
- (0010,2180) Occupation
- (0010,21B0) Additional Patient History
- (0010,4000) Patient Comments

STUDY
- (0008,0020) Study Date
- (0008,0030) Study Time
- (0008,0050) Accession Number
- (0008,0090) Referring Physician's Name
- (0008,1060) Name of Physician(s) Reading Study
- (0008,1080) Admitting Diagnoses Description
- (0008,1030) Study Description
- (0020,0010) Study ID
- (0020,1070) Other Study Numbers (RET)

SERIES
- (0008,0021) Series Date
- (0008,0031) Series Time
- (0008,0060) Modality
- (0008,0070) Manufacturer
- (0008,0080) Institution Name
- (0008,103E) Series Description
- (0008,1090) Manufacturer's Model Name
- (0018,0015) Body Part Examined
- (0018,0022) Scan Options
- (0018,1030) Protocol Name
- (0020,0011) Series Number

4.1.3.1.3 Duplicate Unique IDs

Data with duplicate Unique IDs are in violation of the DICOM standard. However this kind of data is sometimes created in a healthcare enterprise as a workaround for certain workflows. The system has different levels of support depending on which UIDs are duplicated.

- Data with same (duplicate) StudyInstanceUID but with unique Series and/or InstanceUIDs is received and stored in the system.
- Data with same (duplicate) SeriesInsanceUID but in different Studies is received by the system but is not stored in the database. They need to be administratively cleaned out.
- Data with same (duplicate) SOPInstanceUID but in different Series is received and stored in the system.

4.2 AE Specifications

4.2.1 ECHO-SCP

4.2.1.1 SOP Classes

ECHO-SCP provides Standard Conformance to the following SOP Class(es):

Table 4-1 SOP Classes Supported by ECHO-SCP

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	No	Yes

4.2.1.2 Association Policies

4.2.1.2.1 General

ECHO-SCP accepts but never initiates associations.

Table 4-2 Maximum PDU size received as a SCP for ECHO-SCP

Maximum PDU size received	16384

4.2.1.2.2 Number of Associations

Table 4-3 Number of Associations as a SCP for ECHO-SCP

Number of Associations	6

4.2.1.2.3 Asynchronous Nature

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

4.2.1.2.4 Implementation Identifying Information

Table 4-4 DICOM Implementation Class and Version for ECHO-SCP

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.1.3 Association Acceptance Policy

4.2.1.3.1 Activity – Handle Verification Request

4.2.1.3.1.1 Description and Sequencing of Activities

When ECHO-SCP accepts an association, it will respond to echo requests. If the Called AE Title does not match the pre-configured AE Title of the application, the association will be rejected.

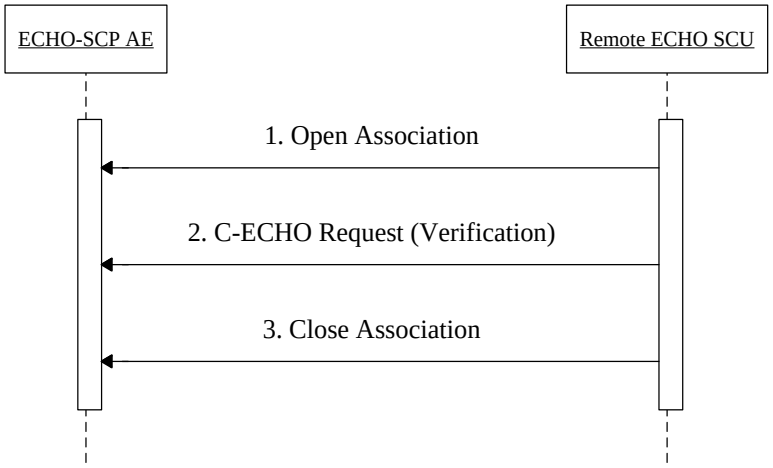

Figure 4.2 Sequencing of Activity – Handling Verification Request

4.2.1.3.1.2 Accepted Presentation Contexts

Table 4-5 Accepted Presentation Contexts for ECHO-SCP

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	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

4.2.1.3.1.3 Extended Negotiation

No extended negotiation is performed.

4.2.1.3.1.4 SOP Specific Conformance

4.2.1.3.1.4.1 SOP Specific Conformance Verification SOP Class

ECHO-SCP provides standard conformance to the Verification Service Class.

4.2.1.3.1.4.2 Presentation Context Acceptance Criterion

ECHO-SCP will only accept a Presentation Context compatible with the one listed in Table 4-5.

4.2.1.3.1.4.3 Transfer Syntax Selection Policies

ECHO-SCP will select the first Transfer Syntax proposed by the client that is supported by the SCP, per Presentation Context.

ECHO-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 method for selecting a Transfer Syntax for each.

4.2.1.3.1.5 Response Status

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

Table 4-6 Response Status for ECHO-SCP and Receive Storage Request

Service Status	Further Meaning	Status Codes	Reason
Refused	Out of Resources	A7xx	Association limit reached, local disk space low
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	

4.2.2 ECHO-SCU

4.2.2.1 SOP Classes

ECHO- SCU provides Standard Conformance to the following SOP Class(es):

Table 4-7 SOP Classes Supported by ECHO-SCU

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No

4.2.2.2 Association Policies

4.2.2.2.1 General

ECHO-SCU initiates associations through a user interface.

Table 4-8 Maximum PDU size received as a SCU for ECHO-SCU

Maximum PDU size received	16384

4.2.2.2.2 Number of Associations

Table 4-9 Number of Associations as a SCU for ECHO-SCU

Number of Associations	1

4.2.2.2.3 Asynchronous Nature

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

4.2.2.2.4 Implementation Identifying Information

Table 4-10 DICOM Implementation Class and Version for ECHO-SCU

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – Sending Verification Request

4.2.2.3.1.1 Description and Sequencing of Activities

ECHO-SCU attempts to initiate a new association when the user requests an Echo from the user interface to a single remote AE. A single attempt will be made to verify the remote AE. If the verification fails, for whatever reason, no retry will be performed. The results will be displayed.

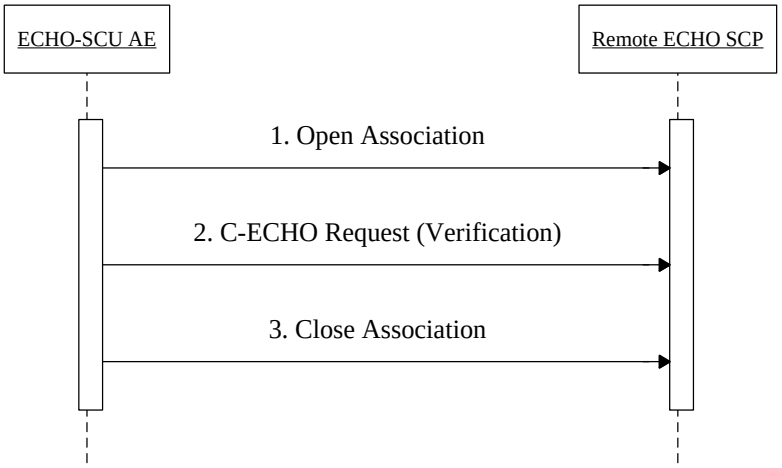

Figure 4.3 Sequencing of Activity – Sending Verification Request

4.2.2.3.1.2 Proposed Presentation Contexts

Table 4-11 Accepted Presentation Contexts for ECHO-SCU

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

4.2.2.3.1.3 Extended Negotiation

No extended negotiation is performed.

4.2.2.3.1.4 SOP Specific Conformance

4.2.2.3.1.4.1 SOP Specific Conformance to Verification SOP Classes

ECHO-SCU provides standard conformance to the Verification Service Class.

4.2.2.3.1.4.2 Presentation Context Acceptance Criterion

ECHO-SCU does not accept associations.

4.2.2.3.1.4.3 Transfer Syntax Selection Policies

ECHO-SCU prefers Explicit VR Little Endian Transfer Syntax, which is always first in the proposed Presentation Context.

4.2.2.3.1.5 Response Status

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

Table 4-12 Response Status for ECHO-SCU and Request Storage

Service Status	Further Meaning	Status Codes	Behavior
Refused	Out of Resources	A7xx	Job set to Failed state
Error	Data Set does not match SOP Class	A9xx	Job set to Failed state
	Cannot understand	Cxxx	Job set to Failed 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

4.2.3 FIND-SCU

4.2.3.1 SOP Classes

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

Table 4-13 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

4.2.3.2 Association Policies

4.2.3.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4-14 DICOM Application Context for FIND-SCU

Application Context Name	1.2.840.10008.3.1.1.1

Table 4-15 Maximum PDU Size Sent for FIND-SCU

Maximum PDU size sent	Unlimited, default is 65536

4.2.3.2.2 Number of Associations

Table 4-16 Number of Associations for FIND-SCU

Maximum number of simultaneous associations	1

4.2.3.2.3 Asynchronous Nature

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

4.2.3.2.4 Implementation Identifying Information

Table 4-17 DICOM Implementation Class and Version for FIND-SCU

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.3.3 Association Initiation Policy

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

4.2.3.3.1 Activity – Query Remote AE

4.2.3.3.1.1 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 and the user is visually notified of the failure.

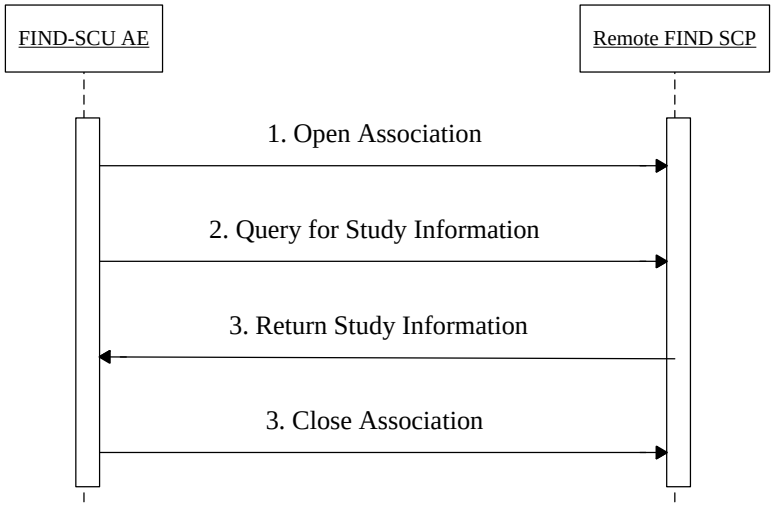

Figure 4.4 Sequencing of Activity – Query Remote AE

4.2.3.3.1.2 Proposed Presentation Contexts

Table 4-18 Proposed Presentation Contexts for FIND-SCU and Query Remote AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**	**1**	
See Table 4-13 SOP Classes Supported by FIND-SCU	See Table 4-13	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	Fuzzy Semantic Matching (optional)
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	Fuzzy Semantic Matching (optional)

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

4.2.3.3.1.3 Extended Negotiation

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

4.2.3.3.1.4 SOP Specific Conformance

4.2.3.3.1.4.1 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, where the default limit is 100 matches. Unexpected attributes returned in a C-FIND response (those not requested) are ignored. Requested return attributes not returned by the SCP will not cause a failure and will be interpreted as empty values, this will be logged for further information. 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 worklist. Duplicate responses will replace existing entries in the display.

Table 4-19 Study Root Request Identifier for FIND-SCU

Name	Tag	Types of Matching
STUDY Level		
Study Date	(0008,0020)	*,U,R
Study Time	(0008,0030)	*,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 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.

4.2.3.3.1.4.2 Presentation Context Acceptance Criterion

FIND-SCU does not accept associations.

4.2.3.3.1.4.3 Transfer Syntax Selection Policies

FIND-SCU uses only Implicit Little Endian Transfer Syntax.

4.2.3.3.1.4.4 Response Status

FIND-SCU will behave as described in Table 4-20 in response to the status returned in the C-FIND response command message(s).

Table 4-20 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	Query is successful
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 worklist
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier	FF01	Returned values not overridden

4.2.3.4 Association Acceptance Policy

FIND-SCU does not accept associations.

4.2.4 FIND-SCP

4.2.4.1 SOP Classes

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

Table 4-21 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

4.2.4.2 Association Policies

4.2.4.2.1 General

FIND-SCP initiates but never accepts associations.

Table 4-22 Maximum PDU Size Received for FIND-SCP

Maximum PDU size received	116794

4.2.4.2.2 Number of Associations

Table 4-23 Number of Associations for FIND-SCP

Maximum number of simultaneous associations	Unlimited

4.2.4.2.3 Asynchronous Nature

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

4.2.4.2.4 Implementation Identifying Information

Table 4-24 DICOM Implementation Class and Version for FIND-SCP

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.4.3 Association Negotiation Policy

FIND-SCP does not initiate associations.

4.2.4.4 Association Acceptance Policy

Incoming connections must be defined from a pre-configured list of known IP addresses, only these connections will be accepted by default. A configuration option for receiving from all IP addresses is available. 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.

4.2.4.4.1 Activity – Receive Query Request

4.2.4.4.1.1 Description and Sequencing of Activities

All queries are matched against records in the database.

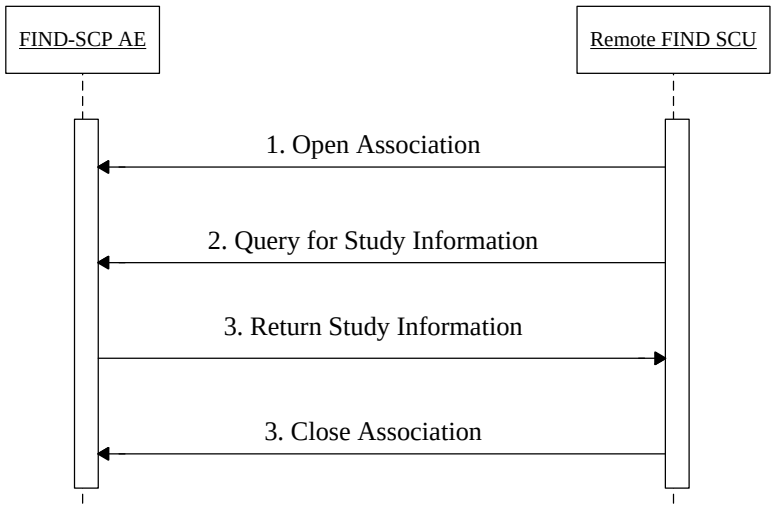

Figure 4.5 Sequencing of Activity – Receive Query Request

4.2.4.4.1.2 Accepted Presentation Contexts

Table 4-25 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 4-21	See Table 4-21	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

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

4.2.4.4.1.2.1 Extended Negotiation

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

4.2.4.4.1.3 SOP Specific Conformance

4.2.4.4.1.3.1 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 responses may be issued at any time, which will terminate the current query.

A hierarchical model will be followed for data matches. The Identifier shall contain all of the Unique Keys at higher levels and all of the values of the Attributes which were passed in on the C-FIND request. Unsupported attributes requested in a C-FIND request are ignored.

All data matching the passed in criteria at the specified level will be returned on the C-FIND response up to a five hundred response limit. Once the responses have reached the limit a successful response will be sent.

Table 4-26 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 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
Number of Study Related Series	(0020,1206)	U
Patient's Birth Date	(0010,0030)	S,U,R
Patient's Sex	(0010,0040)	S,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
Rows	(0028,0010)	U
Columns	(0028,0011)	U
Bits Allocated	(0028,0100)	U
Number of Frames	(0028,0008)	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.

4.2.4.4.1.3.2 Presentation Context Acceptance Criterion

FIND-SCP accepts only a single presentation context.

4.2.4.4.1.3.3 Transfer Syntax Selection Policies

FIND-SCP uses only Implicit Little Endian Transfer Syntax.

4.2.4.4.1.3.4 Response Status

FIND-SCP will behave as described in Table 4-27 in response to the status returned in the C-FIND response command message(s).

Table 4-27 Response Status for FIND-SCP and Receive Query Request

Service Status	Further Meaning	Status Codes	Reason
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

4.2.5 MOVE-SCU

4.2.5.1 SOP Classes

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

Table 4-28 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

4.2.5.2 Association Policies

4.2.5.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4-29 DICOM Application Context for MOVE-SCU

Application Context Name	1.2.840.10008.3.1.1.1

Table 4-30 Maximum PDU Size Sent for MOVE-SCU

Maximum PDU size Sent	Unlimited, default is 65536

4.2.5.2.2 Number of Associations

Table 4-31 Number of Associations for MOVE-SCU

Maximum number of simultaneous associations	Configurable

4.2.5.2.3 Asynchronous Nature

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

4.2.5.2.4 Implementation Identifying Information

Table 4-32 DICOM Implementation Class and Version for MOVE-SCU

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.5.3 Association Initiation Policy

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

4.2.5.3.1 Activity – Retrieve from Remote AE

4.2.5.3.1.1 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 every minute up to 3 times. This number of retries is configurable through the configuration tool.

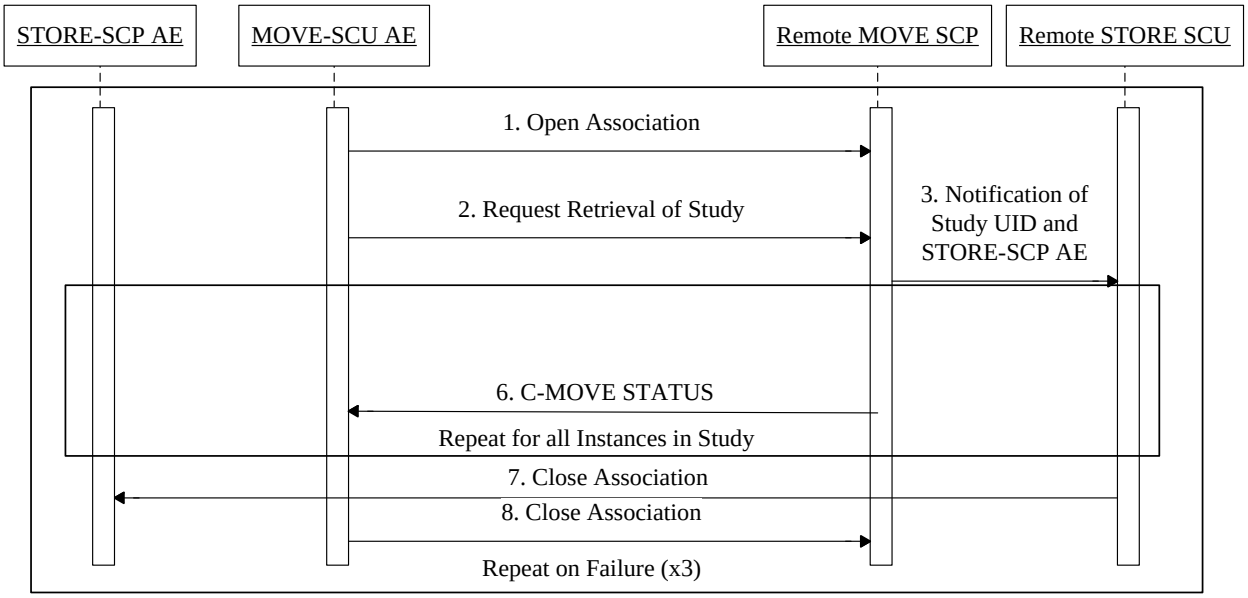

Figure 4.6 Sequencing of Activity – Retrieve from Remote AE

4.2.5.3.1.2 Proposed Presentation Contexts

Table 4-33 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 4-28	See Table 4-28	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

MOVE-SCU will propose a single Presentation Context.

4.2.5.3.1.2.1 Extended Negotiation

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

4.2.5.3.1.3 SOP Specific Conformance

4.2.5.3.1.3.1 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 to configure the FIND-SCU).

Table 4-34 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

4.2.5.3.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCU does not accept associations.

4.2.5.3.1.3.3 Transfer Syntax Selection Policies

MOVE-SCU uses only Implicit Little Endian Transfer Syntax.

4.2.5.3.1.3.4 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 4-35 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; Retries will occur
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	Retrieval is terminated; Retries will occur
	Unable to process	Cxxx	(0000,0901) (0000,0902)	Retrieval is terminated; Retries will occur
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is terminated; Retries will occur
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)	Success of the retrieve
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval continues

4.2.5.3.1.3.5 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 a configurable limit, where the default is 3 times on a one minute interval.

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.

4.2.5.4 Association Acceptance Policy

MOVE-SCU does not accept associations.

4.2.6 MOVE-SCP

4.2.6.1 SOP Classes

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

Table 4-36 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	No	Yes

4.2.6.2 Association Policies

4.2.6.2.1 General

MOVE-SCP accepts but never initiates associations.

Table 4-37 Maximum PDU Size Received for MOVE-SCP

Maximum PDU size received	116794

4.2.6.2.2 Number of Associations

Table 4-38 Number of Associations for MOVE-SCP

Maximum number of simultaneous associations	Unlimited

4.2.6.2.3 Asynchronous Nature

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

4.2.6.2.4 Implementation Identifying Information

Table 4-39 DICOM Implementation Class and Version for MOVE-SCP

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.6.3 Association Initiation Policy

MOVE-SCP does not initiate associations.

4.2.6.4 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.

4.2.6.4.1 Activity – Retrieve Request from Remote AE

4.2.6.4.1.1 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 as sub-operations by the STORAGE-SCU to the requested destination.

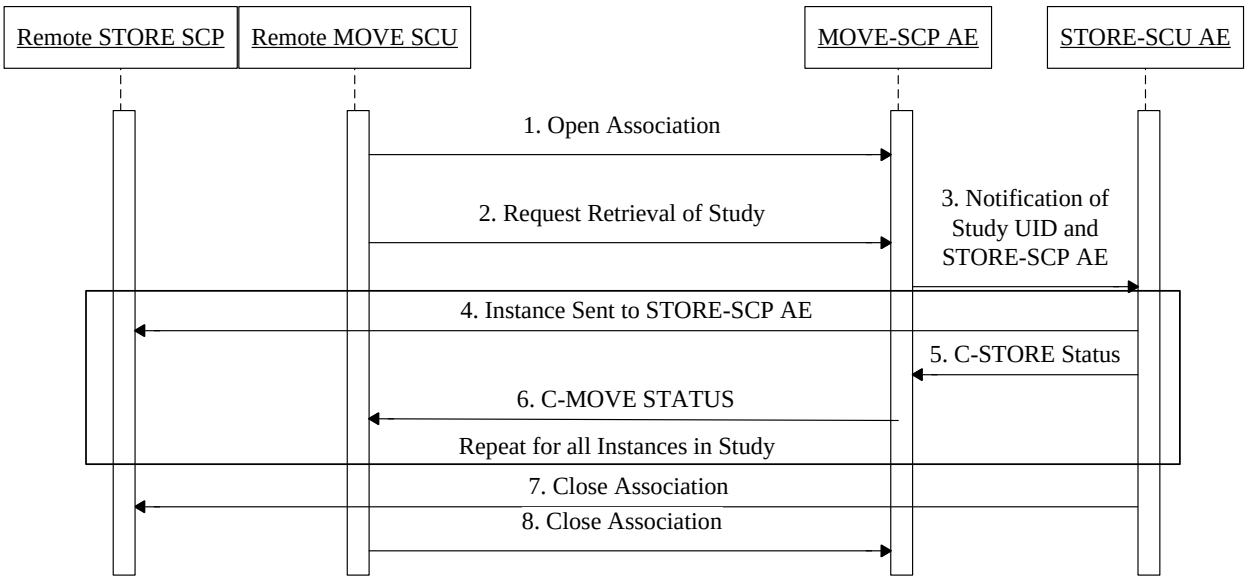

Figure 4.7 Sequencing of Activity – Retrieve Request from Remote AE

4.2.6.4.1.2 Accepted Presentation Contexts

Table 4-40 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 4-36	See Table 4-36	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

MOVE-SCP will accept a single Presentation Context.

4.2.6.4.1.2.1 Extended Negotiation

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

4.2.6.4.1.3 SOP Specific Conformance

4.2.6.4.1.3.1 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 may be issued at any time, which will terminate the current retrieve.

The retrieval is performed to the AE that was specified in the Retrieve AE Destination 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. Multiple destination storage requests are supported.

Table 4-41 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

4.2.6.4.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCP accepts only a single Presentation Context.

4.2.6.4.1.3.3 Transfer Syntax Selection Policies

MOVE-SCP accepts only Implicit Little Endian Transfer Syntax.

4.2.6.4.1.3.4 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 4-42 Response Status for MOVE-SCP and Retrieve Request from Remote AE

Service Status	Further Meaning	Status Codes	Related Fields	Reason
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)	Retrieval is terminated
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

4.2.6.4.1.3.5 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 by the STORAGE-SCU, 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 locally stored. If the association on which the C-MOVE was issued is aborted for any reason, the C-STORE sub-operations are halted. Failures are automatically retried based on the STORAGE-SCU configuration for each of the destinations specified in the C-MOVE request.

4.2.7 STORAGE-SCU

4.2.7.1 SOP Classes

STORAGE-SCU provide Standard Conformance to the following SOP Class(es): see Table 1-1 Network Services

4.2.7.2 Association Policies

4.2.7.2.1 General

STORAGE-SCU initiates, but never accepts associations.

Table 4-43 Maximum PDU Size Sent for STORAGE-SCU

Maximum PDU size sent	Unlimited, default is 16384

4.2.7.2.2 Number of Associations

Table 4-44 Number of Associations for STORAGE-SCU

Maximum number of simultaneous associations	1

4.2.7.2.3 Asynchronous Nature

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

4.2.7.2.4 Implementation Identifying Information

Table 4-45 DICOM Implementation Class and Version for STORAGE-SCU

Implementation Class UID	1.3.6.1.4.1.25403.1.1.1
Implementation Version Name	Dicom 0.1

4.2.7.3 Association Initiation Policy

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

4.2.7.3.1 Activity – Request Storage

4.2.7.3.1.1 Description and Sequencing of Activities

A user can select images 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 images. 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 images then multiple C-STORE requests will be issued over the same Association.

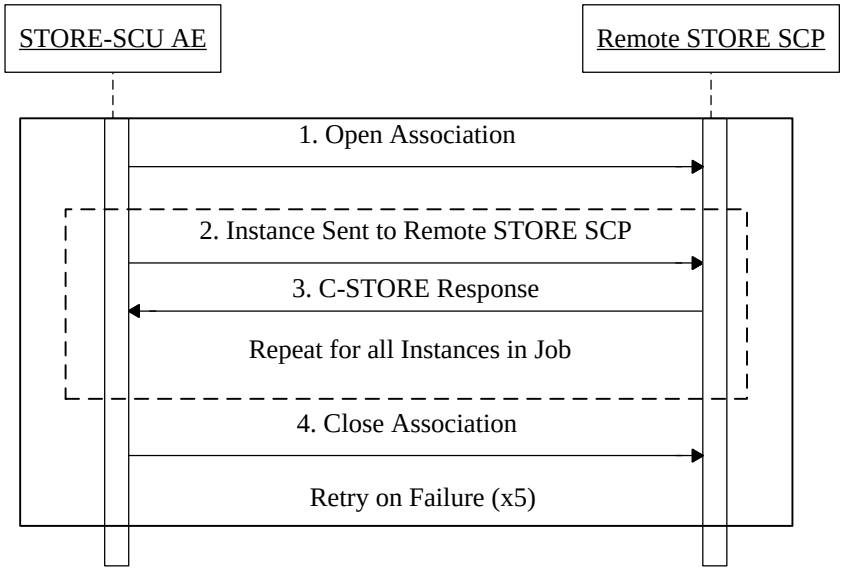

Figure 4.8 Sequencing of Activity –Request Storage

4.2.7.3.1.2 Accepted Presentation Contexts

Table 4-46 Proposed Presentation Contexts for STORAGE-SCU and Request Storage

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.70	SCU	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.70	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.70	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.70	SCU	None

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.70	SCU	None
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.70	SCU	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

4.2.7.3.1.2.1 Extended Negotiation

No extended negotiation is performed, though STORAGE-SCU.

4.2.7.3.1.3 SOP Specific Conformance

4.2.7.3.1.3.1 SOP Specific Conformance to Storage SOP Classes

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

4.2.7.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCU does not accept associations.

4.2.7.3.1.3.3 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
- First encountered Implicit Transfer Syntax
- Default Transfer Syntax

4.2.7.3.1.3.4 Response Status

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

Table 4-47 Response Status for STORAGE-SCU and Request Storage

Service Status	Further Meaning	Status Codes	Behavior
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

4.2.7.4 Association Acceptance Policy

STORAGE-SCU does not accept associations.

4.2.8 STORAGE-SCP

4.2.8.1 SOP Classes

STORAGE-SCP provide Standard Conformance to the following SOP Class(es): see Table 1-1 Network Services

4.2.8.2 Association Policies

4.2.8.2.1 General

STORAGE-SCP accepts but never initiates associations.

Table 4-48 Maximum PDU Size Received for STORAGE-SCP

Maximum PDU size received	16384

4.2.8.2.2 Number of Associations

Table 4-49 Number of Associations for STORAGE-SCP

Maximum number of simultaneous associations	Unlimited

4.2.8.2.3 Asynchronous Nature

STORAGE-SCP will not perform asynchronous operations window negotiation for outstanding negotiations.

4.2.8.2.4 Implementation Identifying Information

Table 4-50 DICOM Implementation Class and Version for STORAGE-SCP

Implementation Class UID	1.2.840.113747.20080222
Implementation Version Name	VIMS_1.0

4.2.8.3 Association Initiation Policy

STORAGE-SCP does not initiate associations.

4.2.8.4 Association Acceptance Policy

When STORAGE-SCP accepts an association, it will respond to storage requests. The exact behavior for a given AE title can be configured by service personnel. A configuration option for receiving only from known IP addresses is available, by default all incoming connections are accepted.

4.2.8.4.1 Activity – Receive Storage Request

4.2.8.4.1.1 Description and Sequencing of Activities

As instances are received they are written to the local file system and a record inserted into the temporary database. If the received instance is a duplicate of a previously received instance, the old file will be overwritten with the new one, however the database records will not. At a later time, the received DICOM instances will be moved to the local disk, updated in the permanent tables, and are then made available for viewing.

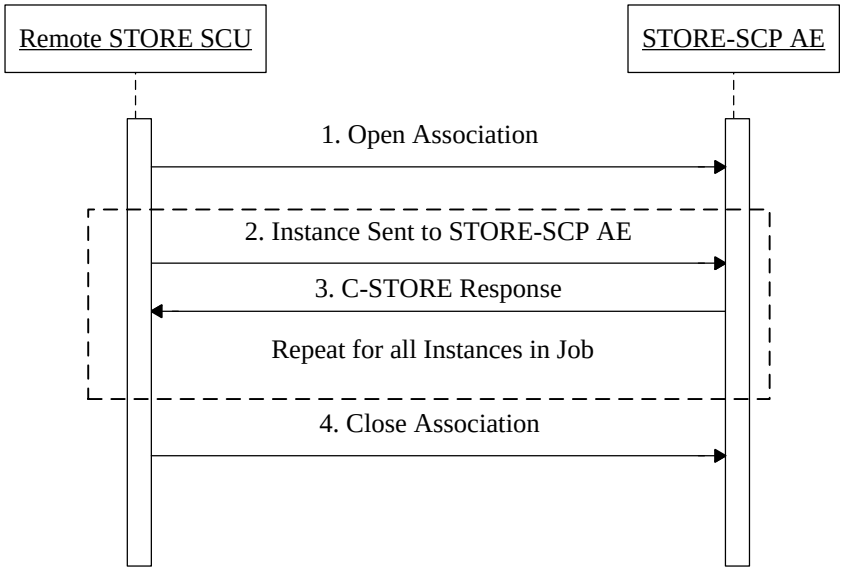

Figure 4.9 Sequencing of Activity – Receive Storage Request

4.2.8.4.1.2 Accepted Presentation Contexts

Table 4-51 Accepted Presentation Contexts for STORAGE-SCP and Receive Storage Request

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	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)	1.2.840.10008.1.2.4.70	SCP	None
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	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)	1.2.840.10008.1.2.4.70	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	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
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	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)	1.2.840.10008.1.2.4.70	SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	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)	1.2.840.10008.1.2.4.70	SCP	None
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	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)	1.2.840.10008.1.2.4.70	SCP	None
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	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

4.2.8.4.1.2.1 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

4.2.8.4.1.3 SOP Specific Conformance

4.2.8.4.1.3.1 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.

When displaying images in the Vitrea applications, the following attributes are not supported:

- Real World Value Mapping Sequence (0040, 9096)

4.2.8.4.1.3.2 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.

4.2.8.4.1.3.3 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
- 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.

4.2.8.4.1.3.4 Response Status

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

Table 4-52 Response Status for STORAGE-SCP and Receive Storage Request

Service Status	Further Meaning	Status Codes	Reason
Refused	Out of Resources	A7xx	Association limit reached, local disk space low
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	

4.3 Network Interfaces

4.3.1 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.

4.3.2 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.

4.4 Configuration

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

4.4.1 AE Title/Presentation Address Mapping

All SCU requests are performed using the “local” AE. 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.

4.4.1.1 Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured via the Service Tool. The Field Service Engineer can configure the TCP Port via the Service Tool.

Table 4-53 AE Title Configuration Table

Application Entity	Default AE Title	Default TCP/IP Port
FIND-SCU	AWS_SCP	Not Applicable
FIND-SCP	AWS_SCP	3003
MOVE SCU	AWS_SCP	Not Applicable
MOVE-SCP	AWS_SCP	3003
STORAGE-SCU	AWS_SCP	Not Applicable
STORAGE-SCP	AWS_SCP	3002

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Titles and port numbers of remote applications are configured using the Service Tool.

4.4.2 Parameters

Table 4-54 Configuration Parameters Table

Parameter	Configurable	Default Value
General Parameters		
PDU Size	No	65kB
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	65kB
AE specific DIMSE level time-out values	No	60 seconds
Number of retries on failure (MOVE-SCU AE, STORE-SCU AE, PRINT-SCU AE only)	Yes	3 (MOVE-SCU AE), 5 (STORE-SCU AE and PRINT-SCU AE)
Number of simultaneous Associations by Service and/or SOP Class	No	Unlimited
SOP Class support	Yes	See Table 4-55
Transfer Syntax support	Yes	See Table 4-56
Supported DIMSE services	No	None
AE Specific Parameters (FIND-SCP)		
Matching responses	No	500
AE Specific Parameters (FIND-SCU)		
Fuzzy Semantic Matching	Yes	False
Transfer Syntaxes	Yes	1.2.840.10008.1.2

Table 4-55 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
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67

Table 4-56 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
JPEG Lossless, Non- Hierarchical (Process 14)	1.2.840.10008.1.2.4.70

5. MEDIA INTERCHANGE

5.1 Implementation Model

5.1.1 Application Data Flow

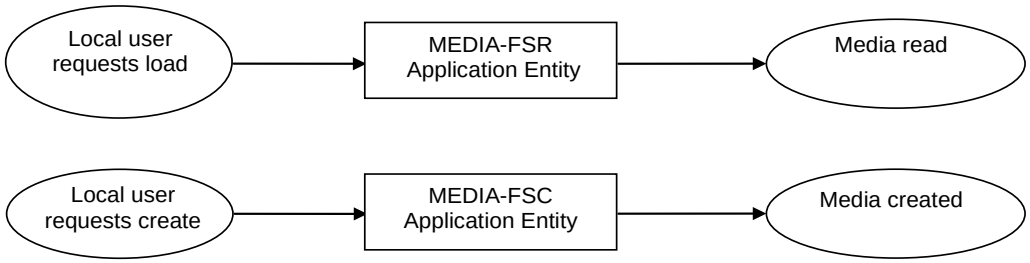

Figure 5.1 Implementation Model

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

5.1.2 Functional Definitions of AE's

5.1.2.1 MEDIA-FSR

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

5.1.2.2 MEDIA-FSC

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

5.1.3 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.

5.2 AE Specifications

5.2.1 MEDIA-FSR

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

Table 5-1 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

5.2.1.1 File Meta Information for the Application Entity

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

5.2.1.2 Real World Activities

5.2.1.2.1 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.

5.2.1.2.1.1 Application Profile Specific Conformance

There are no extensions or specializations.

5.2.2 MEDIA-FSC

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

Table 5-2 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

5.2.2.1 File Meta Information for the Application Entity

The Source Application Entity Title included in the File Meta Header is configurable.

5.2.2.2 Implementation Identifying Information

Table 5-3 DICOM Implementation Class and Version for MEDIA-FSC

Implementation Class UID	1.2.840.113747.1.3.5
Implementation Version Name	VI_DICOM_3.5

5.2.2.3 Real World Activities

5.2.2.3.1 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.

5.2.2.3.1.1 Application Profile Specific Conformance

There are no extensions or specializations.

5.3 Augmented and Private Application Profiles

5.3.1 Augmented Profiles

None.

5.3.2 Private Profiles

None.

5.4 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 5-4 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) (Retired)	1.2.840.10008.1.2.4.53
JPEG Full Progression, Non-Hierarchical (Process 10 & 12) (Retired)	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

6. SUPPORT OF CHARACTER SETS

Vitrea Workstation (Japanese release) supports the following character sets:

- ISO-IR 6 (default) ISO 646
- ISO-IR 100 (ISO 8859-1:1987 Latin Alphabet No. 1 supplementary set).
- ISO 2022 IR 87 (JIS X 0208-1990 Code for the Japanese Graphic Character set for information interchange)

No other character sets are supported.

Table 6-1 lists of ISO-IR 100/87

Attribute Name	Tag	VR
Institution Name	(0008,0080)	LO
Referring Physician's Name	(0008,0090)	PN
Study Description	(0008,1030)	LO
Series Description	(0008,103E)	LO
Name of Physician(s) Reading Study	(0008,1060)	PN
Patient's Name	(0010,0010)	PN
Issuer of Patient ID	(0010,0021)	LO
Protocol Name	(0018,1030)	LO
Image Comment	(0020,4000)	LT

7. SECURITY

7.1 Network

This product does not support any specific network 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.

7.2 Basic Application Level Confidentiality Profile (De-Identification)

The application can remove patient identification from images during Media Storage reading. Partial de-idenification can also be done by selecting Patient Editing vs Anonymization. Editing modifies only those DICOM tags which are selected by the user. The remainder of this section describes anonymization.

The de-identification (Anonymization) process maintains the study/series/image hierarchy of the original images, and any cross references that may exist between images.

The following table describes which DICOM tags are removed or available for modification during de-identification. All other tags (defined in DICOM 3.0 data dictionary) are left unchanged. Private tags are not maintained. The application removes, re-maps, nulls (empty value), or adjusts the required attributes as specified in DICOM PS 3.15 Table E.1-1. Additional attributes from the Patient Identification and Patient Demographic Modules are also removed based on common usage for identifying information.

Note: No change is made to the pixel data, therefore any burnt-in annotations which contain patient identification will remain. The application does not add or modify the Patient Identity Removed (0012,0062) attribute since it is impossible to determine whether or not the image pixel data has been de-identified.

Table 7-1 Attributes Modified During De-Identification

Attribute Name	Dicom Tag	De-identification Action
Instance Creation Date	(0008,0012)	O
Instance Creation Time	(0008,0013)	O
Instance Creator UID	(0008,0014)	R
SOP Instance UID	(0008,0018)	M
Series Date	(0008,0021)	O
Instance Creation Date	(0008,0012)	O
Acquisition DateTime	(0008,002A)	O
Series Time	(0008,0031)	O
Accession Number	(0008,0050)	N, U
Institution Name	(0008,0080)	N
Institution Address	(0008,0081)	N
Referring Physician's Name	(0008,0090)	N
Referring Physician's Address	(0008,0092)	N
Referring Physician's Telephone Numbers	(0008,0094)	N
Station Name	(0008,1010)	N
Study Description	(0008,1030)	N
Series Description	(0008,103E)	N, U
Institutional Department Name	(0008,1040)	N, U
Physician(s) of Record	(0008,1048)	N
Performing Physicians' Name	(0008,1050)	N
Name of Physician(s) Reading Study	(0008,1060)	N
Operators' Name	(0008,1070)	N
Admitting Diagnoses Description	(0008,1080)	N
Additional Patient's History	(0010,21B0)	N
Responsible Person	(0010,2297)	R
Responsible Person Role	(0010,2298)	R
Responsible Organization	(0010,2299)	R
Patient Comments	(0010,4000)	N
Referenced SOP Instance UID	(0008,1155)	M
Derivation Description	(0008,2111)	N
Patient's Name	(0010,0010)	N, U
Patient ID	(0010,0020)	N, U
Patient's Birth Date	(0010,0030)	N, U
Patient's Birth Time	(0010,0032)	N
Patient's Sex	(0010,0040)	N

Patient's Primary Language Seq	(0010,0101)	R
Patients Insurance Plan Code Seq	(0010,0050)	R
Other Patient Ids	(0010,1000)	N
Other Patient Names	(0010,1001)	N
Other Patient IDs Sequence	(0010,1002)	R
Patient's Birth Name	(0010,1005)	R
Patient’s Age	(0010,1010)	N
Patient’s Size	(0010,1020)	N
Patient’s Weight	(0010,1030)	N
Occupation	(0010,2180)	N
Ethnic Group	(0010,2160)	N
Patient's Address	(0010,1040)	R
Patient's Telephone Numbers	(0010,2154)	R
Medical Record Locator	(0010,1090)	N
Branch of Service	(0010,1081)	R
Military Rank	(0010,1080)	R
Patient's Mother's Birth Name	(0010,1060)	R
Device Serial Number	(0018,1000)	N
Protocol Name	(0018,1030)	N
Radiopharmaceutical Start DateTime	(0018,1078)	O
Radiopharmaceutical Stop DateTime	(0018,1079)	O
Frame Acquisition DateTime	(0018,9074)	O
Frame Reference DateTime	(0018,9151)	O
Content Date	(0008,0023)	O
Content Time	(0008,0033)	O
Start Acquisition DateTime	(0018,9516)	O
Stop Acquisition DateTime	(0018,9517)	O
Study Instance UID	(0020,000D)	M
Series Instance UID	(0020,000E)	M
Study ID	(0020,0010)	N
Frame of Reference UID	(0020,0052)	M
Synchronization Frame of Reference UID	(0020,0200)	M
Image Comments	(0020,4000)	N
Request Attributes Sequence	(0040,0275)	R
UID	(0040,A124)	M
Substance Administration DateTime	(0044,0010)	O
Creation Date	(2100,0040)	O
Referenced Frame of Reference UID	(3006,0024)	M

Related Frame of Reference UID	(3006,00C2)	M
Date of Secondary Capture	(0018,1012)	O
Time of Secondary Capture	(0018,0014)	O

In the de-identification action column, the following legend applies:

- N: the attribute is nulled, or set to an empty value.
- R: the attribute is removed entirely.
- M: the value is a DICOM UID that is remapped.
- U: the value is specified by the user.
- G: the value is generated.
- O: date or date/time offset by the difference between the original and modified Study Date.

During de-identification, no attributes are added, with the exception of those specified by the user, replacing the existing DICOM tag values. With the exception of UIDs, Study Date and the Date or Date/time attributes offset by the difference in Study Date (those marked with an O in Table 7-1), no attribute values are generated.

8. ANNEXES

8.1 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
NEVER	Attribute is Not Present

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 value is automatically generated

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

NOTE: The received datasets directly send without processing by STORAGE-SCU.

8.1.1 CT Image SOP Instances

See PS 3.3 A.3.1

Table 8-1 IOD of Created CT SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	8.2.1.1	ALWAYS
Study	General Study	8.2.1.3	ALWAYS
	Patient Study	8.2.1.2	ALWAYS
Series	General Series	8.2.1.5	ALWAYS
Frame of Reference	Frame of Reference	8.2.1.13	ALWAYS
Equipment	General Equipment	8.2.1.4	ALWAYS
Image	General Image	8.2.1.6	ALWAYS
	Image Plane	8.2.1.7	ALWAYS
	Image Pixel	8.2.1.8	ALWAYS
	Contrast/Bolus	8.2.1.9	Included if Contrast used in original images
	CT Image	8.2.1.16	ALWAYS
	SOP Common	8.2.1.12	ALWAYS
	Modality LUT	8.2.1.11	ALWAYS
	VOI LUT	8.2.1.10	ALWAYS
	Vital Images Private	8.2.1.31	ALWAYS

8.1.2 MR Image SOP Instances

See PS 3.3 A.4.1

Table 8-2 IOD of Created MR SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	8.2.1.1	ALWAYS
Study	General Study	8.2.1.3	ALWAYS
	Patient Study	8.2.1.2	ALWAYS
Series	General Series	8.2.1.5	ALWAYS
Frame of Reference	Frame of Reference	8.2.1.13	ALWAYS
Equipment	General Equipment	8.2.1.4	ALWAYS
Image	General Image	8.2.1.6	ALWAYS
	Image Pixel	8.2.1.7	ALWAYS
	Image Plane	8.2.1.8	ALWAYS
	Contrast/Bolus	8.2.1.9	Included if Contrast used in original images
	MR Image	8.2.1.17	ALWAYS
	VOI LUT	8.2.1.10	ALWAYS
	SOP Common	8.2.1.12	ALWAYS
	Vital Images Private	8.2.1.31	ALWAYS

8.1.3 Secondary Capture SOP Instances

See PS 3.3 A.8.1

Table 8-3 IOD of Created Secondary Capture SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	8.2.1.1	ALWAYS
Study	General Study	8.2.1.3	ALWAYS
	Patient Study	8.2.1.2	ALWAYS
Series	General Series	8.2.1.5	ALWAYS
Equipment	General Equipment	8.2.1.4	ALWAYS
	SC Equipment	8.2.1.14	ALWAYS
Image	General Image	8.2.1.6	ALWAYS
	Image Pixel	8.2.1.7	ALWAYS
	SC Image	8.2.1.15	ALWAYS
	SOP Common	8.2.1.12	ALWAYS
	Vital Images Private	8.2.1.31	ALWAYS

8.1.4 XA Image SOP Instances

See PS 3.3 A.14.1

Table 8-4 IOD of Created XA SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	8.2.1.1	ALWAYS
Study	General Study	8.2.1.3	ALWAYS
	Patient Study	8.2.1.2	ALWAYS
Series	General Series	8.2.1.5	ALWAYS
Frame of Reference	Frame of Reference	8.2.1.13	ALWAYS
Equipment	General Equipment	8.2.1.4	ALWAYS
Image	General Image	8.2.1.6	ALWAYS
	Image Pixel	8.2.1.7	ALWAYS
	X-Ray Image	8.2.1.18	ALWAYS
	X-Ray Acquisition	8.2.1.19	ALWAYS
	XA Positioner	8.2.1.20	ALWAYS
	SOP Common	8.2.1.12	ALWAYS
	Vital Images Private	8.2.1.31	ALWAYS

8.1.5 X-Ray 3D Angiographic Image SOP Instances

See PS3.3 section A.53.

Table 8-5 IOD of Created X-Ray 3D Angiographic Image SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	8.2.1.1	ALWAYS
Study	General Study	8.2.1.3	ALWAYS
	Patient Study	8.2.1.2	ALWAYS
Series	General Series	8.2.1.5	ALWAYS
	Enhanced Series	8.2.1.22	ALWAYS
Frame of Reference	Frame of Reference	8.2.1.13	ALWAYS
Equipment	General Equipment	8.2.1.4	ALWAYS
	Enhanced General Equipment	8.2.1.23	ALWAYS
Image	Image Pixel	8.2.1.7	ALWAYS
	Contrast/Bolus	8.2.1.9	Included if Contrast used in original images
	Enhanced Contrast/Bolus	8.2.1.24	NEVER
	Acquisition Context	8.2.1.25	NEVER
	Multi-frame Functional Groups	8.2.1.26	ALWAYS
	X-Ray 3D Image	8.2.1.27	ALWAYS
	SOP Common	8.2.1.12	ALWAYS
	Vital Images Private	8.2.1.31	ALWAYS

8.1.6 Basic Text SR SOP Instances

See PS3.3 section A.35.

Table 8-6 IOD of Created Basic Text SR SOP Instances

IE	Module	Reference	Presence of Module
Patient	Patient	8.2.1.1	ALWAYS
Study	General Study	8.2.1.3	ALWAYS
	Patient Study	8.2.1.2	ALWAYS
Series	SR Document Series	8.2.1.28	ALWAYS
	Presentation Series	8.2.1.21	ALWAYS
Equipment	General Equipment	8.2.1.4	ALWAYS
Document	SR Document General	8.2.1.29	ALWAYS
	SR Document Content	8.2.1.30	ALWAYS
	SOP Common	8.2.1.12	ALWAYS

8.2 Modules

8.2.1 Common Modules

8.2.1.1 Patient Module

See DICOM PS 3.3 C.7.1.1 for more information.

Table 8-7 Patient Module of Created SOP Instances

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

8.2.1.2 Patient Study Module

See DICOM PS 3.3 C.7.2.2 for more information.

Table 8-8 Patient Study Module of Created SOP Instances

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

8.2.1.3 General Study Module

See DICOM PS 3.3 C.7.2.1 for more information.

Table 8-9 General Study Module of Created SOP Instances

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

8.2.1.4 General Equipment Module

See DICOM PS 3.3 C.7.5.1

Table 8-10 General Equipment Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	"CANON_MEC" for Original "TOSHIBA_MEC" for Option	ALWAYS	AUTO
Institution Name	(0008,0080)	LO	From source images	VNAP	SRC
Institution Address	(0008,0081)	ST	From source images	VNAP	SRC
Institution Department	(0008,1040)	LO	From source images	VNAP	SRC
Manufacturer's Model Name	(0008,1090)	LO	Automatically Generated	ALWAYS	AUTO

8.2.1.5 General Series Module

See DICOM PS 3.3 C.7.3.1

Table 8-11 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 or User Entered	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Automatically Generated	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Automatically Generated	ALWAYS	AUTO

8.2.1.6 General Image Module

See DICOM PS 3.3 C.7.6.1

Table 8-12 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

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

8.2.1.7 Image Plane Module

See DICOM PS 3.3 C.7.6.2

Table 8-13 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

8.2.1.8 Image Pixel Module

See DICOM PS 3.3 C.7.6.3

Table 8-14 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

8.2.1.9 Contrast/Bolus Module

See DICOM PS 3.3 C.7.6.4

Table 8-15 Contrast/Bolus Module of Created SOP Instances

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

8.2.1.10 VOI LUT Module

See DICOM PS 3.3 C.11.2

Table 8-16 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

8.2.1.11 Modality LUT Module

See DICOM PS 3.3 C.11.1

Table 8-17 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

8.2.1.12 SOP Common Module

See DICOM PS 3.3 C.12.1

Table 8-18 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

8.2.1.13 Frame of Reference Module

See DICOM PS 3.3 C.7.4.1

Table 8-19 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 images	ALWAYS	SRC
Position Reference Indicator	(0020,1040)	LO	From source images	VNAP	SRC

8.2.1.14 Secondary Capture Equipment Module

See DICOM PS 3.3 C.8.6.1

Table 8-20 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

8.2.1.15 Secondary Capture Image Module

See DICOM PS 3.3 C.8.6.2

Table 8-21 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

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

8.2.1.16 CT Image Module

See DICOM PS 3.3 C.8.2.1

Table 8-22 CT Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
KVP	(0018,0060)	DS	From source images	VNAP	SRC
Data Collection Diameter	(0018,0090)	DS	From source images	ANAP	SRC
Reconstruction Diameter	(0018,1100)	DS	From source images	ANAP	SRC
Gantry/Detector Tilt	(0018,1120)	DS	From source images	ANAP	SRC
Table Height	(0018,1130)	DS	From source images	ANAP	SRC
Rotation Direction	(0018,1140)	CS	From source images	ANAP	SRC
Exposure Time	(0018,1150)	IS	From source images	ANAP	SRC
X-Ray Tube Current	(0018,1151)	IS	From source images	ANAP	SRC
Exposure	(0018,1152)	IS	From source images	ANAP	SRC
Filter Type	(0018,1160)	SH	From source images	ANAP	SRC
Generator Power	(0018,1170)	IS	From source images	ANAP	SRC
Convolution Kernel	(0018,1210)	SH	From source images	ANAP	SRC
Acquisition Number	(0020,0012)	IS	From source images	VNAP	SRC

8.2.1.17 MR Image Module

See DICOM PS 3.3 C.8.3.1

Table 8-23 MR Image Module of Created SOP Instances

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

8.2.1.18 X-Ray Image Module

See DICOM PS 3.3 C.8.7.1

Table 8-24 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 images	ALWAYS	SRC

8.2.1.19 X-Ray Acquisition Module

See DICOM PS 3.3 C.8.7.2

Table 8-25 X-Ray Acquisition Module of Created SOP Instances

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

8.2.1.20 XA Positioner Module

See DICOM PS 3.3 C.8.7.5

Table 8-26 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

8.2.1.21 Presentation Series Module

See DICOM PS 3.3 C.11.9

Table 8-27 Presentation Series Module of Created SOP Instances

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

8.2.1.22 Enhanced Series Module

See DICOM PS 3.3 C.7.3.3

Table 8-28 Enhanced Series Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Series Number	(0020,0011)	IS	Automatically generated	ALWAYS	AUTO

8.2.1.23 Enhanced General Equipment Module

See DICOM PS 3.3 C.7.5.2

Table 8-29 Enhanced General Equipment Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	"CANON_MEC" for Original "TOSHIBA_MEC" for Option	ALWAYS	AUTO
Manufacturer's Model Name	(0008,1090)	LO	Automatically generated	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO	Automatically generated	ALWAYS	AUTO
Software Versions	(0018,1020)	LO	Automatically generated	ALWAYS	AUTO

8.2.1.24 Enhanced Contrast/Bolus Module

See DICOM PS 3.3 C.7.6.4b

Table 8-30 Enhanced Contrast/Bolus Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Contrast/Bolus Agent Sequence	(0018,0012)	SQ	Entire sequence copied from source images	ANAP	SRC

8.2.1.25 Acquisition Context

See DICOM PS 3.3 C.7.6.14

Table 8-31 Acquisition Context Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Acquisition Context Sequence	(0040,0555)	SQ	Empty sequence	ALWAYS	AUTO

8.2.1.26 Multi-frame Functional Groups

See DICOM PS 3.3 C.7.6.16

Table 8-32 Multi-frame Functional Groups Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Shared Functional Groups Sequence	(5200,9229)	SQ		ALWAYS	AUTO
>Pixel Value Transformation Sequence	(0028,9145)	SQ		ALWAYS	AUTO
>>Rescale Intercept	(0028,1052)	DS	Automatically generated	ALWAYS	AUTO
>>Rescale Slope	(0028,1053)	DS	Automatically generated	ALWAYS	AUTO
>>Rescale Type	(0028,1054)	LO	No value	NEVER	AUTO
Per-Frame Functional Groups Sequence	(5200,9229)	SQ		ALWAYS	AUTO
>Derivation Image Sequence	(0008,9124)	SQ		NEVER	AUTO
>X-Ray 3D Frame Type Sequence	(0018,9504)	SQ		NEVER	AUTO
>Frame Content Sequence	(0020,9111)	SQ		NEVER	AUTO
>Plane Position Sequence	(0020,9113)	SQ		ALWAYS	AUTO
>>Image Position (Patient)	(0020,0032)	DS	Automatically generated	ALWAYS	AUTO
>Plane Orientation Sequence	(0020,9116)	SQ		ALWAYS	AUTO
>>Image Orientation (Patient)	(0020,0037)	DS	Automatically generated	ALWAYS	AUTO
>Frame Anatomy Sequence	(0020,9071)	SQ		NEVER	AUTO
>Pixel Measures Sequence	(0028,9110)	SQ		ALWAYS	AUTO
>>Slice Thickness	(0018,0050)	DS	No value	NEVER	AUTO
>>Pixel Spacing	(0028,0030)	DS	Automatically generated	ALWAYS	AUTO
>Frame VOI LUT Sequence	(0028,9132)	SQ		NEVER	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
Number of Frames	(0028,0008)	IS	Automatically generated	ALWAYS	AUTO

8.2.1.27 X-Ray 3D Image

See DICOM PS 3.3 C.8.21.1

Table 8-33 X-Ray 3D Image Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS	Automatically generated	ALWAYS	AUTO
Pixel Presentation	(0008,9205)	CS	No value	NEVER	AUTO
Volumetric Properties	(0008,9206)	CS	VOLUME	ALWAYS	AUTO
Volume Based Calculation Technique	(0008,9207)	CS	NONE	ALWAYS	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
Samples Per Pixel	(0028,0002)	US	1	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	AUTO
Content Qualification	(0018,9004)	CS	No value	NEVER	AUTO
Burned In Annotation	(0028,0301)	CS	NO	ALWAYS	AUTO
Lossy Image Compression	(0028,2110)	CS	No value	NEVER	AUTO
Presentation LUT Shape	(2050,0020)	CS	IDENTITY	ALWAYS	AUTO

8.2.1.28 SR Document Series

See DICOM PS 3.3 C.17.1

Table 8-34 SR Document Series Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	SR	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Automatically generated	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Automatically generated	ALWAYS	AUTO
Referenced Performed Procedure Step Sequence	(0008,1111)	SQ	Empty sequence	ALWAYS	AUTO

8.2.1.29 SR Document General

See DICOM PS 3.3 C.17.2

Table 8-35 SR Document General Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Automatically generated	ALWAYS	AUTO
Completion Flag	(0040,A491)	CS	COMPLETE	ALWAYS	AUTO
Verification Flag	(0040,A493)	CS	VERIFIED	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Automatically generated	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Automatically generated	ALWAYS	AUTO
Verifying Observer Sequence	(0040,A073)	SQ	Empty sequence	ALWAYS	AUTO
>Verifying Observer Name	(0040,A075)	PN	Automatically generated	ALWAYS	AUTO
>Verifying Observer Identification Code Sequence	(0040,A088)	SQ	Empty sequence	ALWAYS	AUTO
>Verifying Organization	(0040,A027)	LO	Toshiba-Medical	ALWAYS	AUTO
>Verification Date Time	(0040,A030)	DT	Automatically generated	ALWAYS	AUTO
Performed Procedure Code Sequence	(0040,A372)	SQ	Empty sequence	ALWAYS	AUTO

8.2.1.30 SR Document Content

See DICOM PS 3.3 C.17.3

Table 8-36 SR Document Content Module of Created SOP Instances

Attribute Name	Tag	VR	Value	Presence of Value	Source
Value Type	(0040,a040)	CS	CONTAINER	ALWAYS	AUTO
Concept Name Code Sequence	(0040,a043)	SQ	Empty sequence	ALWAYS	AUTO
>Code Value	(0008,0100)	SH	121070	ALWAYS	AUTO
>Coding Scheme Designator	(0008,0102)	SH	DCM	ALWAYS	AUTO
>Code Meaning	(0008,0104)	LO	Findings	ALWAYS	AUTO
Continuity of Content	(0040,A050)	CS	SEPARATE	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ	Automatically generated	ALWAYS	AUTO

8.2.1.31 Vital Images Private Module

Table 8-37 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	ANAP	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
Saved Workflow Data	(5653,xx24)	OB	Automatically Generated	ANAP	AUTO
Saved Workflow Data Length	(5653,xx25)	SL	Automatically Generated	ANAP	AUTO

8.3 Data Dictionary of Private Attributes

Table 8-38 Vital Images 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
(5653,xx24)	Saved Workflow Data	OB	1
(5653,xx25)	Saved Workflow Data Length	SL	1