

DICOM Conformance Statement

Send/Query Image (SQI) Integration Module



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Table of Contents

A.1: CONFORMANCE STATEMENT OVERVIEW	6
A.2: INTRODUCTION	6
A.2.1: Definitions, Terms, and Abbreviations.....	6
A.2.2: References	7
A.3: IMPLEMENTATION MODEL.....	8
A.3.1: Application Data Form Diagram	8
A.3.2: Functional Definitions of AE's	9
A.3.2.1: Functional Definition of Echo AE.....	9
A.3.2.2: Functional Definition of Transmit AE.....	9
A.3.2.3: Functional Definition of Query/Retrieve AE.....	9
A.3.3: Sequencing of Real-World Activities	9
A.3.3.1: Echo	9
A.3.3.2: Transmit Image.....	9
A.3.3.3: Query/Retrieve operation	10
A.4: AE SPECIFICATIONS.....	10
A.4.1: Echo AE.....	10
A.4.1.1: SOP Classes	10
A.4.1.2: Association Policies.....	10

A.4.1.2.1: General	10
A.4.1.2.2: Number of Associations	10
A.4.1.2.3: Asynchronous Nature	11
A.4.1.2.4: Implementation Identifying Information	11
A.4.1.3: Association Initiation Policy	11
A.4.1.3.1: Associated Real-World Activity	11
A.4.1.3.2: Proposed Presentation Contexts	11
A.4.1.3.3: SOP Specific Conformance Statement.....	11
A.4.1.4: Association Acceptance Policy.....	11
A.4.2: Transmit AE	12
A.4.2.1: SOP Classes	12
A.4.2.2: Association Policies.....	14
A.4.2.2.1: General	14
A.4.2.2.2: Number of Associations	15
A.4.2.2.3: Asynchronous Nature	15
A.4.2.2.4: Implementation Identifying Information.....	15
A.4.2.3: Association Initiation Policy	15
A.4.2.3.1: Associated Real-World Activity	15
A.4.2.3.2: Proposed Presentation Contexts	15
A.4.2.3.3: SOP Specific Conformance Statement.....	16
A.4.2.4: Association Acceptance Policy.....	17
A.4.3: Query/Retrieve AE	17

A.4.3.1: SOP Classes	17
A.4.3.2: Association Policies.....	21
A.4.3.2.1: General	21
A.4.3.2.2: Number of Associations	21
A.4.3.2.3: Asynchronous Nature	21
A.4.3.2.4: Implementation Identifying Information.....	22
A.4.3.3: Association Initiation Policy	22
A.4.3.3.1: Real-World Activity Query.....	22
A.4.3.3.2: Real-World Activity Retrieve	23
A.4.3.4: Association Acceptance Policy.....	24
A.5: COMMUNICATION PROFILE	25
A.5.1: Supported Communication Stacks	25
A.5.2: OSI Stack.....	25
A.5.3: TCP/IP Stack	25
A.5.3.1: API	25
A.5.3.2: Physical Media Support.....	25
A.6: EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS	25
A.7: CONFIGURATION.....	25
A.7.1: AE Title/Presentation Address Mapping	25
A.7.1.1: Local AE Title	25
A.7.1.2: Remote AE Title/ Presentation Address Mapping.....	26

A.8: SUPPORT OF EXTENDED CHARACTER SETS26

A.1: CONFORMANCE STATEMENT OVERVIEW

This document is the DICOM conformance statement for the Send/Query Image (hereby referred to as SQI) Integration Module for ImaSight. SQI supports the following features:

1. **Echo Mode:** This is used to verify network connectivity to a remote DICOM application.
2. **Transmit Image Mode:** This is used to transmit images to a remote DICOM application using TCP/IP.
3. **Query/Retrieve Mode:** This is used to search a DICOM database and retrieve images based on the search result.

A.2: INTRODUCTION

This document is the DICOM conformance statement for the Send/Query Image (hereby referred to as SQI) Integration Module for ImaSight. It details the DICOM Service Classes, Information Objects, and Communication Protocols that are supported by this product.

If the reader is unfamiliar with DICOM, it is recommended that they read the DICOM specification (referenced below) prior to reading this conformance statement. This document has been formatted as per DICOM Specification, Part 2: Conformance.

A.2.1: Definitions, Terms, and Abbreviations

- **DICOM** – Digital Imaging and Communications in Medicine.
- **AE Title (Application Entity Title)** – The representation used to identify the DICOM nodes communicating between each other.
- **Calling AE Title** – The Application Entity (AE) that initiates the DICOM messaging service request. It is based on the Source DICOM Application Name.
- **Called AE Title** – The Application Entity (AE) that is the intended acceptor of the service request. It is based on the Destination DICOM Application Name.
- **Transfer Syntax** – A set of encoding rules that allows Application Entities to unambiguously negotiate the encoding techniques (e.g., Data Element structure, byte ordering, compression) they are able to support, thereby allowing these Application Entities to communicate.
- **DIMSE - DICOM Message Service Element** – The Application Service Element (both the service and protocol) used by peer DICOM Application Entities for the purpose of exchanging medical images and related information.
- **SCU (Service Class User)** – The role played by a DICOM Application Entity (DIMSE-Service-User) which invokes operations and performs notifications on a specific Association as a server

- **SCP (Service Class Provider)** – The role played by a DICOM Application Entity (DIMSE-Service-Provider), which invokes operations and performs notifications on a specific association as a client.
- **Storage SCU** – The DICOM Application Entity that performs the role of the service class user for the DICOM C-STORE service. A SCU role is typically associated with a client action.
- **Storage SCP** – The DICOM Application Entity that performs the role of the service class provider for the DICOM C-STORE service. A SCP role is typically associated with a server action.
- **Echo SCU** – The DICOM Application Entity that performs the role of the service class user for the DICOM C-ECHO service. This is a basic "is everything working OK" service (sometimes referred to as "DICOM Ping"). It should not be confused with a basic ICMP ping. However, it is a full-blown DICOM service using full negotiation, and therefore tests more than simple IP connectivity. Support for C-ECHO is mandatory for all Application Entities that accept associations.
- **Move SCU** – The DICOM Application Entity that performs the role of the service class user for the DICOM C-MOVE service.
- **Query SCU** – The DICOM Application Entity that performs the role of the service class user for the DICOM C-FIND service.
- **SOP (Service Object Pair)** – The union of a specific set of DIMSE Services and one related Information Object Definition (as specified by a Service Class Definition), which completely defines a precise context for communication of operations on such an object or notifications about its state.
- **IOD (Information Object Definition) Module** – A number of logically related IE Modules are grouped together to form an IOD Module. For instance, a CT Image IOD Module consists of a Patient Module, Study Module, Image Module, etc.
- **Information Entity (IE) Module** – A number of logically related elements grouped together. PatientModule is an example. It contains Data Elements like Patient Name (0010,0010), Patient ID (0010,0020), Referenced Patient Sequence (0008,1120), etc. In DICOM 3.0, the Group Number has no particular significance. An IE may consist of Data Elements from different Groups. Various IE Modules can then be grouped in to IOD Modules.
- **PDU (Protocol Data Unit)** – The fragment of messages exchanged between peer DICOM Application Entities.
- **ASCE (Association Control Service Element)**

A.2.2: References

- ACR-NEMA Digital Imaging and Communications in Medicine, DICOM V3.0

A.3: IMPLEMENTATION MODEL

A.3.1: Application Data Form Diagram

SQL consists of a collection of independent processes that deal with DICOM communication. Only a single process can be executed at one time. There is one process that takes care of verifying network connectivity to a remote SCP, another process that transmits images to a remote SCP, and a third process that queries and retrieves images from a remote DICOM database. From a functional perspective, the processes that implement SQL's DICOM network interface can be separated into the following application entities: Echo AE, Transmit AE, and Query/Retrieve AE. All application entities use the same Application Entity Title, which is configurable using a menu item.

The relation between the entities can be represented by the following data flow diagram.

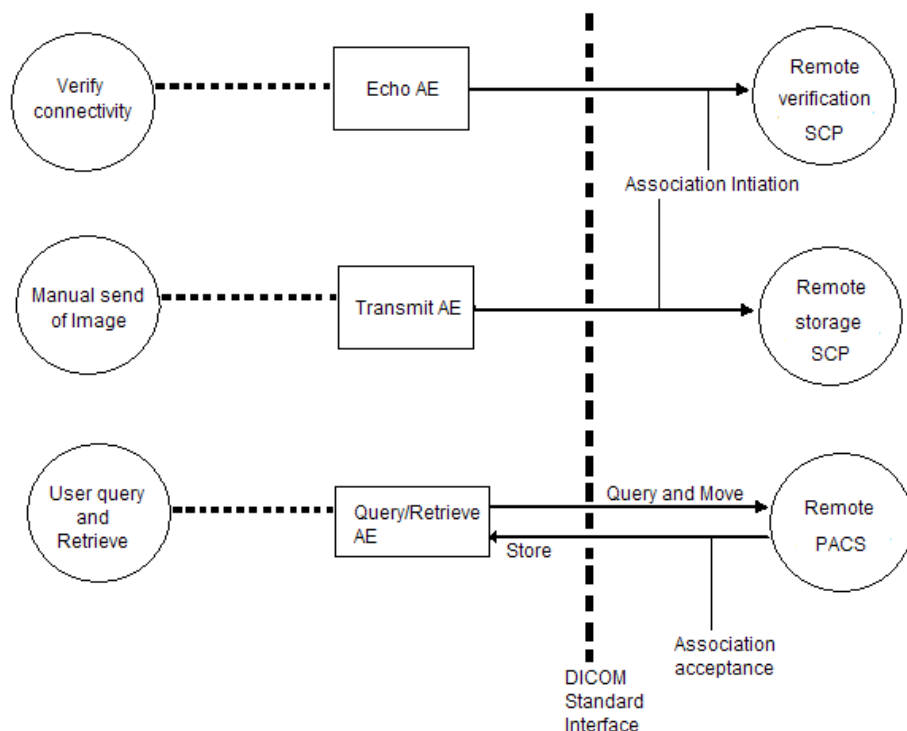


Figure 3.1

A.3.2: Functional Definitions of AE's

A.3.2.1: Functional Definition of Echo AE

The Echo AE is used to verify that a remote SCP is active and reachable on the network. Echo AE will attempt to establish an association, send a C-ECHO request, and wait for a response. The success or failure of the operation is reported to the user. The AE supports the Verification Class as Service Class User.

A.3.2.2: Functional Definition of Transmit AE

The Transmit AE is used to send images to a remote SCP. A transmission request may consist of a single image or multiple images selected from the hard disk. All objects comprising one transmission request are transmitted over one association. The Transmit AE will attempt to establish an association, send transmission request objects, and wait for a response. The success or failure of the operation is reported to the user. The AE supports the (short list of) known storage sop classes as defined by DCMTK. This list is guaranteed to have at most 64 entries.

A.3.2.3: Functional Definition of Query/Retrieve AE

The Query/Retrieve AE is used to query and retrieve images from a remote DICOM database. The AE acts as an SCU of Query/Retrieve. The AE implements a Storage SCP to store the received images. The AE establishes an association with a user-selected remote AE, sends find and move requests, and waits for responses. The success or failure of the operation is reported to the user. The AE supports the (full list of) known storage sop classes that a storage SCP might want to store. This list is defined by DCMTK.

A.3.3: Sequencing of Real-World Activities

A.3.3.1: Echo

1. User selects the remote AE from a combo box.
2. User then clicks the "Send" button to send an echo request to the remote AE.
3. Status is displayed in the "Status" field.

A.3.3.2: Transmit Image

1. User selects the remote AE from a combo box.
2. User selects the file(s) to be transferred from the hard disk.
3. User then clicks the "Send" button to transmit the selected file(s).
4. When the "Send" button is clicked, all "Transmit image" related fields are hidden and a "Status" field is displayed. The status of the operation is displayed here.

A.3.3.3: Query/Retrieve operation

1. User selects the remote AE from a combo box.
2. User can obtain the search list using the patient ID, patient name, referring physician's name, study description, date of birth, and date range
3. User clicks the "Search" button to retrieve the search result image file(s).
4. The files are stored in a directory that is configurable.

A.4: AE SPECIFICATIONS

A.4.1: Echo AE

A.4.1.1: SOP Classes

The Echo AE provides standard conformance to the following DICOM V3.0 SOP Class:

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

Table A.4.1.1: SOP Class for Echo AE

A.4.1.2: Association Policies

A.4.1.2.1: General

The Echo AE shall utilize and understand the following Application Context Name:

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1
--------------------------------	-----------------------

Table A.4.1.2.1: DICOM Application Context

The Echo AE supports a minimum PDU size of 4 KB and a maximum PDU size of 128 KB. The default value is set to 16 KB.

A.4.1.2.2: Number of Associations

The Echo AE shall attempt only one association establishment at a time.

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

Table A.4.1.2.2: Number of Associations as an Association Initiator for Echo AE

A.4.1.2.3: Asynchronous Nature

The Echo AE shall only send a single C-ECHO request on an association.

Maximum number of outstanding asynchronous transactions	1
---	---

Table A.4.1.2.3: Number of Associations as an Association Initiator for Echo AE

A.4.1.2.4: Implementation Identifying Information

The Echo AE shall specify the following implementation identifying information:

Implementation Class UID	1.2.276.0.7230010.3.0.3.5.4
Implementation Version Name	OFFIS_DCMTK_354

Table A.4.1.2.4: DICOM Implementation Class and Version for Echo AE

A.4.1.3: Association Initiation Policy

The Echo AE attempts to establish an association when the user requests a verification service.

A.4.1.3.1: Associated Real-World Activity

The Echo AE initiates associations for the echo service. The association is closed when either a correct response is received or when a timeout occurs.

A.4.1.3.2: Proposed Presentation Contexts

The Echo AE works with a single presentation context.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List	SCU	None
Verification Service Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2		

Table A.4.1.3.2: Presentation Context Table

A.4.1.3.3: SOP Specific Conformance Statement

None.

A.4.1.4: Association Acceptance Policy

Echo AE does not accept associations.

A.4.2: Transmit AE

A.4.2.1: SOP Classes

The Transmit AE provides Standard Conformance to the following DICOM V3.0 SOP:

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	YES	NO
Digital X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.1	YES	NO
Digital X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	YES	NO
Digital Mammography X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.2	YES	NO
Digital Mammography X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.2.1	YES	NO
Digital IntraOral X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.3	YES	NO
Digital IntraOral X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	YES	NO
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	YES	NO
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	YES	NO
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	YES	NO
Pseudo Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	YES	NO
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	YES	NO
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	YES	NO
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	YES	NO
X-Ray Fluoroscopy Image Storage	1.2.840.10008.5.1.4.1.1.12.2	YES	NO
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	YES	NO
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	YES	NO
PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	YES	NO
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	YES	NO
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	YES	NO
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	YES	NO

SOP Class Name	SOP Class UID	SCU	SCP
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	YES	NO
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	YES	NO
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	YES	NO
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	YES	NO
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	YES	NO
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	YES	NO
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	YES	NO
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	YES	NO
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	YES	NO
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	YES	NO
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	YES	NO
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	YES	NO
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	YES	NO
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	YES	NO
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	YES	NO
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	YES	NO
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	YES	NO
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	YES	NO
Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	YES	NO
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	YES	NO
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	YES	NO
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	YES	NO
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	YES	NO
VL Slide Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	YES	NO

SOP Class Name	SOP Class UID	SCU	SCP
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	YES	NO
Ophthalmic Photography 8Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	YES	NO
Ophthalmic Photography 16Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	YES	NO
Stereo metric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	YES	NO
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	YES	NO
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	YES	NO
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	YES	NO
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	YES	NO
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	YES	NO
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	YES	NO
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	YES	NO
XRy Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	YES	NO
Twelve Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	YES	NO
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	YES	NO
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	YES	NO
Hemo Dynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	YES	NO
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	YES	NO
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	YES	NO

Table A.4.2.1: SOP Class for Transmit AE

A.4.2.2: Association Policies

A.4.2.2.1: General

The Transmit AE shall utilize and understand the following Application Context Name:

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1
--------------------------------	-----------------------

Table A.4.2.2.1: DICOM Application Context

The Transmit AE supports a minimum PDU size of 4 KB and a maximum PDU size of 128 KB. The default value is set to 16 KB.

A.4.2.2.2: Number of Associations

The Transmit AE shall attempt only one association establishment at a time.

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

Table A.4.2.2.2: Number of Associations as an Association Initiator for Transmit AE

A.4.2.2.3: Asynchronous Nature

All association requests must be completed and acknowledged before a new operation can be initiated. Thus, the Transmit AE does not provide asynchronous behavior.

Maximum number of outstanding asynchronous transactions	1
---	---

Table A.4.2.2.3: Number of Associations as an Association Initiator for Transmit AE

A.4.2.2.4: Implementation Identifying Information

The Transmit AE shall specify the following Implementation Identifying Information:

Implementation Class UID	1.2.276.0.7230010.3.0.3.5.4
Implementation Version Name	OFFIS_DCMTK_354

Table A.4.2.2.4: DICOM Implementation Class and Version for Transmit AE

A.4.2.3: Association Initiation Policy

The Transmit AE attempts to establish an association when the user requests a transmission service for each set of images (selected from the hard disk).

A.4.2.3.1: Associated Real-World Activity

The Transmit AE initiates associations when a user requests the transmission of images. The association is closed when either the transmission is successful or when a timeout occurs.

A.4.2.3.2: Proposed Presentation Contexts

The Transmit AE works with the following 3 transfer syntaxes:

- Little Endian Explicit Transfer Syntax
- Big Endian Explicit Transfer Syntax
- Little Endian Implicit Transfer Syntax

The first transfer syntax is based on the machine. In other words, if the machine is a little endian machine, then the first transfer syntax is “Little Endian Explicit Transfer Syntax”. If the machine is a big endian machine, then the first transfer syntax is “Big Endian Explicit Transfer Syntax”.

The second transfer syntax is either “Little Endian Explicit Transfer Syntax” or “Big Endian Explicit Transfer Syntax”, depending on the identity of the first transfer syntax.

The third transfer syntax is “Little Endian Implicit Transfer Syntax”. The second and third act as fallback transfer syntaxes.

Each SOP Class (listed in Table A.4.2.1) will be proposed with the above 3 transfer syntaxes.

Presentation Context Table							
Abstract Syntax		Transfer Syntax				Role	Extended Negotiation
Name	UID	Name List		UID List			
All SOP Classes listed in Table A.4.2.1		Implicit Endian	VR	Little	1.2.840.10008.1.2	SCU	None
All SOP Classes listed in Table A.4.2.1		Explicit Endian	VR	Little	1.2.840.10008.1.2.1	SCU	None
All SOP Classes listed in Table A.4.2.1		Explicit VR Big Endian			1.2.840.10008.1.2.2	SCU	None

Table A.4.2.3.2: Presentation Context Table

A.4.2.3.3: SOP Specific Conformance Statement

The Transmit AE operation involves the following sequence of steps for each set of image(s) transfer:

1. Association establishment
2. Data transfer
3. Association release

In the case of a successful C-STORE response from the SCP, the Transmit AE will continue to send any unsent images. The association will be properly released after all selected images have been sent.

A.4.2.4: Association Acceptance Policy

The Transmit AE does not accept associations.

A.4.3: Query/Retrieve AE

A.4.3.1: SOP Classes

The Query/Retrieve AE provides Standard Conformance to the following DICOM V3.0 SOP:

SOP Class Name	SOP Class UID	SCU	SCP
FIND Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.1	YES	NO
MOVE Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.2	YES	NO

Table A.4.3.1: SOP Class for Query/Retrieve AE as SCU

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	NO	YES
Stored Print Storage	1.2.840.10008.5.1.1.27	NO	YES
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	NO	YES
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	NO	YES
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	NO	YES
Digital X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.1	NO	YES
Digital X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.1.1	NO	YES
Digital Mammography X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.2	NO	YES
Digital Mammography X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.2.1	NO	YES
Digital Intra Oral X-Ray Image Storage for Presentation	1.2.840.10008.5.1.4.1.1.1.3	NO	YES
Digital Intra Oral X-Ray Image Storage for Processing	1.2.840.10008.5.1.4.1.1.1.3.1	NO	YES

SOP Class Name	SOP Class UID	SCU	SCP
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	NO	YES
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	NO	YES
Standalone VOILUT Storage	1.2.840.10008.5.1.4.1.1.11	NO	YES
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	NO	YES
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	NO	YES
Pseudo Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	NO	YES
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	NO	YES
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	NO	YES
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	NO	YES
X-Ray Fluoroscopy Image Storage	1.2.840.10008.5.1.4.1.1.12.2	NO	YES
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	NO	YES
RETIRED X-Ray Angiographic Bi Plane Image Storage	1.2.840.10008.5.1.4.1.1.12.3	NO	YES
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	NO	YES
PET Curve Storage	1.2.840.10008.5.1.4.1.1.129	NO	YES
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	NO	YES
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	NO	YES
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	NO	YES
RETIRED Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3	NO	YES
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	NO	YES
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	NO	YES
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	NO	YES
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	NO	YES
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	NO	YES

SOP Class Name	SOP Class UID	SCU	SCP
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	NO	YES
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	NO	YES
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	NO	YES
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	NO	YES
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	NO	YES
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	NO	YES
RETIRED Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.5	NO	YES
RETIRED Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6	NO	YES
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	NO	YES
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	NO	YES
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	NO	YES
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	NO	YES
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	NO	YES
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	NO	YES
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	NO	YES
Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	NO	YES
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	NO	YES
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	NO	YES
RETIRED VL Image Storage	1.2.840.10008.5.1.4.1.1.77.1	NO	YES
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	NO	YES
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	NO	YES
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	NO	YES
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	NO	YES

SOP Class Name	SOP Class UID	SCU	SCP
VL Slide Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	NO	YES
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	NO	YES
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	NO	YES
Ophthalmic Photography 8Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	NO	YES
Ophthalmic Photography 16Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	NO	YES
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	NO	YES
RETIRED VL MultiFrame Image Storage	1.2.840.10008.5.1.4.1.1.77.2	NO	YES
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	NO	YES
DRAFT SR Text Storage	1.2.840.10008.5.1.4.1.1.88.1	NO	YES
DRAFT SR Audio Storage	1.2.840.10008.5.1.4.1.1.88.2	NO	YES
DRAFT SR Detail Storage	1.2.840.10008.5.1.4.1.1.88.3	NO	YES
DRAFT SR Comprehensive Storage	1.2.840.10008.5.1.4.1.1.88.4	NO	YES
Basic Text SR	1.2.840.10008.5.1.4.1.1.88.11	NO	YES
Enhanced SR	1.2.840.10008.5.1.4.1.1.88.22	NO	YES
Comprehensive SR	1.2.840.10008.5.1.4.1.1.88.33	NO	YES
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	NO	YES
Mammography CAD SR	1.2.840.10008.5.1.4.1.1.88.50	NO	YES
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	NO	YES
Chest CAD SR	1.2.840.10008.5.1.4.1.1.88.65	NO	YES
XRy Radiation Dose SR	1.2.840.10008.5.1.4.1.1.88.67	NO	YES
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	NO	YES
DRAFT Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1	NO	YES
Twelve Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	NO	YES
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	NO	YES
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	NO	YES

SOP Class Name	SOP Class UID	SCU	SCP
Hemo dynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	NO	YES
Cardiac Electro physiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	NO	YES
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	NO	YES

Table A.4.3.1-1: SOP Class for Query/Retrieve AE as Storage SCP

A.4.3.2: Association Policies

A.4.3.2.1: General

The Query/Retrieve AE shall utilize and understand the following Application Context Name:

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1
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Table A.4.3.2.1: DICOM Application Context

The Query/Retrieve AE supports a minimum PDU size of 4 KB and a maximum PDU size of 128 KB. The default value is set to 16 KB.

A.4.3.2.2: Number of Associations

The Query/Retrieve AE shall attempt and accept only one association establishment at a time.

Maximum number of simultaneous associations	1
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Table A.4.3.2.2: Number of Associations as an Association Initiator for Query/Retrieve AE

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

Table A.4.3.2.2-1: Number of Associations as an Association Acceptor for Query/Retrieve AE

A.4.3.2.3: Asynchronous Nature

All association operations must be completed and acknowledged before a new operation can be initiated. Thus, the Query/Retrieve AE does not provide asynchronous behavior.

Maximum number of outstanding asynchronous transactions	1
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Table A.4.3.2.3: Number of Associations as an Association Initiator for Query/Retrieve AE

Maximum number of outstanding asynchronous transactions	1
---	---

Table A.4.3.2.3-1: Number of Associations as an Association Acceptor for Query/Retrieve AE

A.4.3.2.4: Implementation Identifying Information

The Query/Retrieve AE shall specify the following Implementation Identifying Information:

Implementation Class UID	1.2.276.0.7230010.3.0.3.5.4
Implementation Version Name	OFFIS_DCMTK_354

Table A.4.3.2.4: DICOM Implementation Class and Version for Query/Retrieve AE

A.4.3.3: Association Initiation Policy

The Query/Retrieve AE attempts to establish an association when the user requests a query to be performed.

A.4.3.3.1: Real-World Activity Query

A.4.3.3.1.1: Associated Real-World Activity

The Query/Retrieve AE initiates associations and does a C-FIND request when a user requests a query to be performed. The association is closed when either the Query/Retrieve operation is successful or when a timeout occurs.

A.4.3.3.1.2: Proposed Presentation Contexts

The Query/Retrieve AE works with the following 3 transfer syntaxes:

- Little Endian Explicit Transfer Syntax
- Big Endian Explicit Transfer Syntax
- Little Endian Implicit Transfer Syntax

The first transfer syntax is based on the machine. In other words, if the machine is a little endian machine, then the first transfer syntax is “Little Endian Explicit Transfer Syntax”. If the machine is a big endian machine, then the first transfer syntax is “Big Endian Explicit Transfer Syntax”.

The second transfer syntax is either “Little Endian Explicit Transfer Syntax” or “Big Endian Explicit Transfer Syntax”, depending on the identity of the first transfer syntax.

The third transfer syntax is “Little Endian Implicit Transfer Syntax”. The second and third act as fallback transfer syntaxes.

The FIND SOP Class (listed in Table A.4.3.1-1) will be proposed with the above 3 transfer syntaxes.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
FIND Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
FIND Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
FIND Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Table A.4.3.3.1.2: Presentation Context Table

A.4.3.3.1.3: SOP Specific Conformance Statement

The implementation conforms to SOP Class of Query/Retrieve Service Class as SCU.

A.4.3.3.2: Real-World Activity Retrieve

A.4.3.3.2.1: Associated Real-World Activity

The Query/Retrieve AE initiates an association and does C-MOVE request. The association from the remote AE responding to C-MOVE is accepted. The association is closed when either the Query/Retrieve operation is successful or when a timeout occurs.

A.4.3.3.2.2: Proposed Presentation Contexts

When acting as an SCP, the Query/Retrieve application will prefer transfer syntaxes with an explicit encoding over the default implicit transfer syntax. The Query/Retrieve AE works with the following 3 transfer syntaxes:

- Little Endian Explicit Transfer Syntax
- Big Endian Explicit Transfer Syntax
- Little Endian Implicit Transfer Syntax

The first transfer syntax is based on the machine. In other words, if the machine is a little endian machine, then the first transfer syntax is “Little Endian Explicit Transfer Syntax”. If the machine is a big endian machine, then the first transfer syntax is “Big Endian Explicit Transfer Syntax”.

The second transfer syntax is either “Little Endian Explicit Transfer Syntax” or “Big Endian Explicit Transfer Syntax”, depending on the identity of the first transfer syntax.

The third transfer syntax is “Little Endian Implicit Transfer Syntax”. The second and third act as fallback transfer syntaxes.

The MOVE SOP Class (listed in Table A.4.3.1-1) will be proposed with the above 3 transfer syntaxes.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
MOVE Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
MOVE Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
MOVE Patient Root Query Retrieve Information Model	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

Table A.4.3.3.2.2: Presentation Context Table

A.4.3.3.2.3: SOP Specific Conformance Statement

The implementation conforms to SOP Class of Query/Retrieve Service Class as SCP.

A.4.3.4: Association Acceptance Policy

The Query/Retrieve AE accepts associations generated by remote applications in response to C-MOVE request.

A.5: COMMUNICATION PROFILE

A.5.1: Supported Communication Stacks

This product provides DICOM TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

A.5.2: OSI Stack

Not Applicable.

A.5.3: TCP/IP Stack

This product inherits its TCP/IP stack from the computer system upon which it executes.

A.5.3.1: API

Not Applicable.

A.5.3.2: Physical Media Support

This product inherits the physical medium from the computer system upon which it executes.

A.6: EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

Not Applicable.

A.7: CONFIGURATION

A.7.1: AE Title/Presentation Address Mapping

A.7.1.1: Local AE Title

All AEs use the same AE Title. This AE Title must be specified using the 'Configure' Menu (when the application executes for the first time).

A.7.1.2: Remote AE Title/ Presentation Address Mapping

Multiple remote AE's can be configured using the 'Configure' menu. The parameters that can be configured for each remote AE are as follows:

1. Name – This is a general name that identifies the remote AE.
2. AE Title – This is the remote AE Title.
3. IP Address – The IP address of the remote AE (to which a connection has to be made).
4. Port No. – The port number that has to be used to make a connection to the remote AE.
5. PDU Size – The maximum PDU Size that has to be used for the connection. This is in kilobytes and has a range of 4 to 128 KB. The default size is 16 KB.
6. Timeout – This is the ASCE timeout value (in seconds). The default value is 30 seconds.

A.8: SUPPORT OF EXTENDED CHARACTER SETS

Not Applicable.