Canon

No. 2G985-062EN

DICOM CONFORMANCE STATEMENT
FOR
DIAGNOSTIC WORKSTATION
AZE Virtual Place
MODEL
AVP-001A
V3.8 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

This product is a networked computer system used for diagnostic medical device. It is able to receive images from external systems, and is able to retrieve information about such images. The system conforms to the DICOM standard to allow the sharing of medical information with other digital imaging systems.

Table 1-1 provides an overview of the network services supported by this product.

Table 1-1

NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Verification		
Verification	Yes	Yes
Transfer		
Computed Radiography Image Storage	Yes	Yes
CT Image Storage	Yes	Yes
Enhanced CT Image Storage	Yes	Yes
MR Image Storage	Yes	Yes
Enhanced MR Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
X-Ray Angiographic Image Storage*	Yes	Yes
Nuclear Medicine Image Storage	Yes	Yes
Positron Emission Tomography Image Storage	Yes	Yes
Digital X-Ray Image Storage – For Presentation	Yes	No
Digital X-Ray Image Storage – For Processing	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	Yes	No
Digital Mammography X-Ray Image Storage – For Processing	Yes	No
Digital Intra-oral X-Ray Image Storage – For Presentation	Yes	No
Digital Intra-oral X-Ray Image Storage – For Processing	Yes	No
Ultrasound Image Storage	Yes	No
Ultrasound Multi-frame Image Storage	Yes	No
X-Ray Radio Fluoroscopic Image Storage	Yes	No
Hardcopy Color Image Storage	Yes	No
Hardcopy Grayscale Image Storage	Yes	No
RT Image Storage	Yes	No
RT Dose Storage	Yes	No
RT Structure Set Storage	Yes	No
RT Beams Treatment Record Storage	Yes	No
RT Plan Storage	Yes	No
RT Brachy Treatment Record Storage	Yes	No

RT Treatment Summary Record Storage	Yes	No
Stand-alone Curve Storage	Yes	No
12-lead ECG Waveform Storage	Yes	No
General ECG Waveform Storage	Yes	No
Stand-alone Modality LUT Storage (Retired)	Yes	No
Stand-alone Overlay Storage (Retired)	Yes	No
Stand-alone VOI LUT Storage (Retired)	Yes	No
Standalone PET Curve Storage (Retired)	Yes	No
Stored Print Storage (Retired)	Yes	No
VL Endoscopic Image Storage	Yes	No
VL Microscopic Image Storage	Yes	No
VL Slide-Coordinates Microscopic Image Storage	Yes	No
VL Photographic Image Storage	Yes	No
Basic Text SR Storage	Yes	No
Enhanced SR Storage	Yes	No
Comprehensive SR Storage	Yes	No
Query/Retrieve		
Study Root Q/R Information Model – Find	Yes	Yes
Study Root Q/R Information Model – Move	Yes	Yes
Print Management		
Basic Grayscale Print Management	Yes	No
Basic Color Print Management	Yes	No

Table 1-2
MEDIA SERVICES

Media Storage Application Profile	Write Files (FSC)	Read Files (FSR)
Compact Disk		
General Purpose CD-R	Yes	Yes
DVD Recordable		
General Purpose DVD-R	Yes	Yes
DVD-Random Access		
General Purpose DVD-RAM	Yes	Yes

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3 INTRODUCTION

3.1. REVISION HISTORY

REV.	Date of Issue	Author	Description
/	April 24, 2020	Canon Medical Systems	Initial Version

3.2. AUDIENCE

This document is intended for hospital staff, health system integrators, software designers, service staff, and implementers. It is assumed that the reader has a working understanding of DICOM.

3.3. REMARKS

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of intended information.

The scope of this Conformance Statement is to facilitate communication with Canon Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself, this Conformance Statement do not guarantee the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

— Comparison of different conformance statements is the first step towards assessing interconnectivity between the product and other equipment.
— Test procedures should be defined to validate the desired level of connectivity.
— The DICOM standard will evolve to meet the future requirements of users. Canon Medical Systems Corporation is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue them.

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 Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network 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*.

Attribute – a unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

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: MR Image IOD, CT Image IOD, Print Job IOD.

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

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), imaging workstation (image query/retrieve SCU)

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

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a *SOP Class*. Examples: a specific x-ray image.

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], (0019,0210) [private data element]

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.

3.6. ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title
ASCE	Association Control Service Element
CR	Computed Radiography
CT	Computed Tomography
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DX	Digital Radiography
IE	Information Entity
IOD	Information Object Definition
ISO	International Standards Organization
JPEG	Joint Photographic Experts Group
KO	Key Object Selection
MG	Mammography
MR	Magnetic Resonance
NM	Nuclear Medicine
PDU	Protocol Data Unit
PET	Positron Emission Tomography
RF	X-Ray Radio Fluoroscopy
PR	Presentation State
RG	Radiographic Imaging
RTIMAGE	Radiotherapy Image
RTDOSE	Radiotherapy Dose
RTPLAN	Radiotherapy Plan
RTRECORD	RT Treatment Record
RTSTRUCT	Radiotherapy Structure Set
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UID	Unique Identifier
US	Ultrasound
VM	Value Multiplicity
VR	Value Representation
XA	X-Ray Angiography

3.7. REFERENCES

Digital Imaging and Communications in Medicine (DICOM) Standard, available free at http://medical.nema.org/

4 NETWORKING

4.1. IMPLEMENTATION MODEL

4.1.1. Application Data Flow

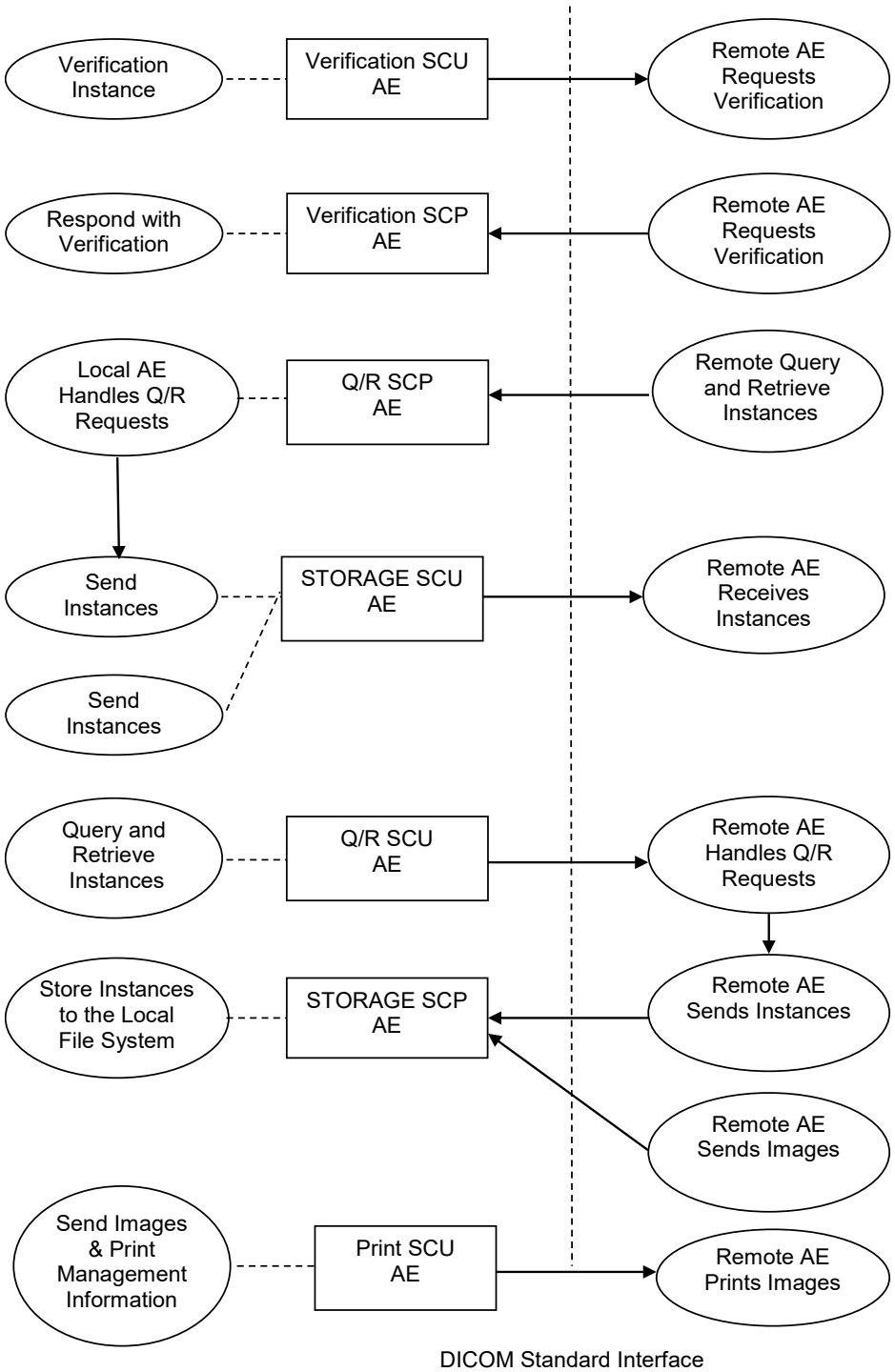

Figure 4.1-1
APPLICATION DATA FLOW DIAGRAM

— Verification SCU, which verification requests to the specified DICOM destination.
— Verification SCP, which responds to verification requests.
— STORAGE SCU, which sends outbound images and other composite instances.

- STORAGE SCP, which receives incoming images and other composite instances.
- Q/R SCU, which queries a remote AE for lists of Studies, Series, and Instances. And Q/R SCU AE retrieves selected studies, series, and instances.
- Q/R SCP AE can handle incoming query and retrieve requests. It can handle external queries for Patient, Study, Series, and Image data, and also handle Image retrieval requests. Q/R SCP AE handles retrieval requests by issuing a command to the STORAGE SCU AE to send the requested Images to the destination specified by the Remote AE. Q/R SCP AE functions as an SCP for C-FIND and C-MOVE requests.
- Print SCU, which prints images on a remote AE (Printer or Imager). It is associated with the local real-world activity “Send Images & Print Management Information”. “Send Images & Print Management Information” creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user.

4.1.2. Functional Definitions of AEs

4.1.2.1. Functional Definition of Verification SCU AE

The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE.

4.1.2.2. Functional Definition of Verification SCP AE

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

4.1.2.3. Functional Definition of STORAGE SCU AE

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

4.1.2.4. Functional Definition of STORAGE SCP AE

STORAGE SCP AE waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class, and will store the received instances to the local database where they may subsequently be listed and viewed through the user interface.

4.1.2.5. Functional Definition of Q/R SCU AE

Q/R SCU AE is activated through the user interface when a user selects a remote AE to query (from a preconfigured list) and then initiates a query. Queries are performed recursively from the study through the series and instance levels until all matching instances have been listed.

Q/R SCU AE is activated through the user interface when a user selects a study, series, or instance for retrieval. A connection to the remote AE is established to initiate and monitor the retrieval, and the STORAGE SCP AE receives the retrieved instances.

4.1.2.6. Functional Definition of Q/R SCP AE

Q/R SCP AE waits for another application to connect at the presentation address configured for its AE Title. When another application connects, Q/R SCP AE expects it to be a DICOM application. Q/R SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Q/R Service Class. It will handle query and retrieve requests on these Presentation Contexts and respond with data objects with values corresponding to the contents of the database. For C-MOVE requests the destination for the image objects is determined from the Destination AE Title contained in the C-MOVE request. When a retrieval request is received, the Q/R SCP AE issues a command to the STORAGE SCU AE to send the specified images to the C-MOVE Destination AE.

4.1.2.7. Functional Definition of Print SCU AE

The existence of a print-job in the print queue will activate the Print SCU AE. An Association is established with the printer and the printer’s status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. If the printer is not operating normally, an error message will be displayed and this print-job can be canceled or restarted by the user operations.

4.1.3. Sequencing of Real-World Activities

All SCP activities are performed asynchronously in the background and are not dependent on any sequencing.

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

4.2. AE SPECIFICATIONS

4.2.1. Verification SCU AE Specification

4.2.1.1. SOP Classes

Verification SCU AE provides Standard Conformance to the following DICOM SOP Classes:

Table 4.2-1
SOP Classes supported by Verification SCP AE

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

4.2.1.2. Association Policies

4.2.1.2.1. General

Verification SCU AE accepts but never initiates associations.

The DICOM Standard application context name for DICOM is always proposed:

Table 4.2-2
DICOM Application Context for Verification SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-3
Maximum PDU size received for Verification SCU AE

Maximum PDU size received	60000 bytes(Configurable)

4.2.1.2.2. Number of Associations

Verification SCU AE can support up to 1 Associations at a time.

There is no inherent limit to the number of associations other than limits imposed by the computer's operating system.

Table 4.2-4
Number of Associations for Verification SCU AE

Maximum number of simultaneous associations	1

4.2.1.2.3. Asynchronous Nature

Verification SCU AE will only allow a single outstanding operation on an association. Therefore, The Verification SCU AE will not perform asynchronous operation window negotiation.

4.2.1.2.4. Implementation Identifying Information

Table 4.2-5
DICOM Implementation Class and Version for Verification SCP AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VPFR_3.8

4.2.1.3. Association Initiation Policy

Verification SCP AE does not initiate associations.

4.2.1.4. Association Acceptance Policy

4.2.1.4.1. Activity – Receive to Verification Request

4.2.1.4.1.1. Description and Sequencing of Activities

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

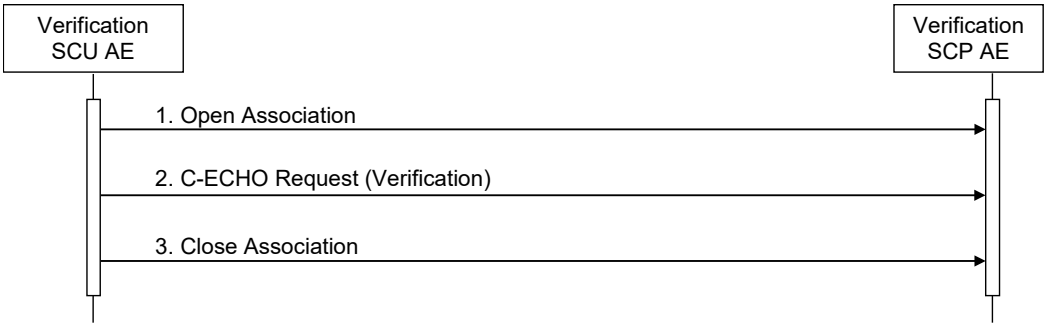

Figure 4.2-1
SEQUENCING OF ACTIVITY

:

1. Verification SCU AE opens an association with Verification SCP AE.
2. Verification SCU AE issues a verification request (C-ECHO) and Verification SCP AE replies with a C-ECHO response (status success).
3. Verification SCU AE closes the association with Verification SCP AE.

4.2.1.4.1.2. Accepted Presentation Contexts

Table 4.2-6
Acceptable Presentation Contexts for Verification SCP AE

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

4.2.1.4.1.2.1. Extended Negotiation

No extended negotiation is performed.

4.2.1.4.1.3. SOP Specific Conformance

4.2.1.4.1.3.1. SOP Specific Conformance to Verification SOP Class

Table 4.2-7
VERIFICATION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	

4.2.2. Verification SCP AE Specification

4.2.2.1. SOP Classes

Verification SCP AE provides Standard Conformance to the following DICOM SOP Classes:

Table 4.2-8
SOP Classes supported by Verification SCP AE

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

4.2.2.2. Association Policies

4.2.2.2.1. General

Verification SCP AE accepts but never initiates associations.

The DICOM Standard application context name for DICOM is always accepted:

Table 4.2-9
DICOM Application Context for Verification SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-10
Maximum PDU size received for Verification SCP AE

Maximum PDU size received	60000 bytes(Configurable)

4.2.2.2.2. Number of Associations

Verification SCP AE can support up to 1 Associations at a time.

Table 4.2-11
Number of Associations for Verification SCP AE

Maximum number of simultaneous associations	1

4.2.2.2.3. Asynchronous Nature

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

4.2.2.2.4. Implementation Identifying Information

Table 4.2-12
DICOM Implementation Class and Version for Verification SCP AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VFRP_3.8

4.2.2.3. Association Initiation Policy

Verification SCP AE does not initiate associations.

4.2.2.4. Association Acceptance Policy

4.2.2.4.1. Activity – Receive to Verification Request

4.2.2.4.1.1. Description and Sequencing of Activities

When Verification SCP AE accepts an association, it will respond to a verification request (C-ECHO).

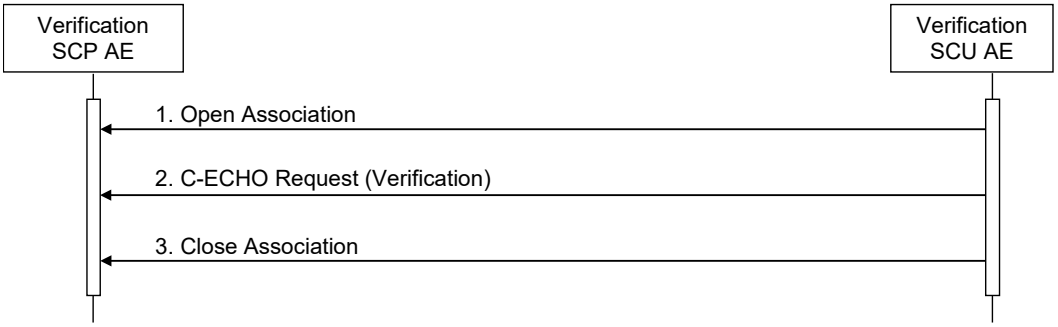

Figure 4.2-2
SEQUENCING OF ACTIVITY – RESPOND TO VERIFICATION REQUEST

A possible sequence of interactions between the Verification SCP AE and the Server (e.g. a storage or archive device supporting the Verification SOP Classes as an SCU) is illustrated in the figure above:

1. Verification SCU AE opens an association with Verification SCP AE.
2. Verification SCU AE issues a verification request (C-ECHO) and Verification SCP AE replies with a C-ECHO response (status success).
3. Verification SCU AE closes the association with Verification SCP AE.

4.2.2.4.1.2. Accepted Presentation Contexts

Table 4.2-13
Acceptable Presentation Contexts for Verification SCP AE

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

4.2.2.4.1.2.1. Extended Negotiation

No extended negotiation is performed.

4.2.2.4.1.3. SOP Specific Conformance

4.2.2.4.1.3.1. SOP Specific Conformance to Verification SOP Class

Verification SCP AE provides standard conformance to the Verification Service Class as an SCP.

The behavior of Verification SCP AE when encountering status codes in a C-ECHO response is summarized in the table below:

Table 4.2-14
VERIFICATION RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Verification SCP AE judges Verification SCU AE is present and active on the network.

4.2.2.4.1.3.2. Presentation Context Acceptance Criteria

Verification SCP AE 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.

4.2.2.4.1.3.3. Transfer Syntax Selection Policies

Verification SCP AE 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 the Transfer Syntax to each.

4.2.3. STORAGE SCU AE Specification

4.2.3.1. SOP Classes

STORAGE SCU AE provides Standard Conformance to the following DICOM SOP Classes:

Table 4.2-15
SOP Classes supported by STORAGE SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	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
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	No
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	No
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	No
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	No
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	No
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Yes	No
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	No
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	No
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	No
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
X-Ray Radio Fluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	No
Hardcopy Color Image Storage	1.2.840.10008.5.1.4.1.1.30	Yes	No
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.4.1.1.29	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
Stand-alone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Yes	No
12-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
Stand-alone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Yes	No
Stand-alone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Yes	No
Stand-alone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	Yes	No

Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Yes	No
Stored Print Storage (Retired)	1.2.840.10008.5.1.1.27	Yes	No
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	No
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	No
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	No
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	No
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Yes	No
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	No
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	No

4.2.3.2. Association Policies

4.2.3.2.1. General

STORAGE SCU AE initiates but never accepts associations.

The DICOM Standard application context name for DICOM is always proposed:

Table 4.2-16
DICOM Application Context for STORAGE SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-17
Maximum PDU size received for STORAGE SCU AE

Maximum PDU size received	60000 bytes(Configurable)

4.2.3.2.2. Number of Associations

STORAGE SCP AE can support up to 1 Associations at a time.

Table 4.2-18
Number of Associations for STORAGE SCU AE

Maximum number of simultaneous associations	1

4.2.3.2.3. Asynchronous Nature

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

4.2.3.2.4. Implementation Identifying Information

The implementation information for the STORAGE SCU AE is:

Table 4.2-19
DICOM Implementation Class and Version for STORAGE SCU AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VPFR_3.8

4.2.3.3. Association Initiation Policy

4.2.3.3.1. Activity – Send Storage Request

4.2.3.3.1.1. Description and Sequencing of Activities

The Storage SCU AE attempts to initiate a new association in order to issue a storage request. If the job contains multiple instances then multiple storage requests will be issued over the same association.

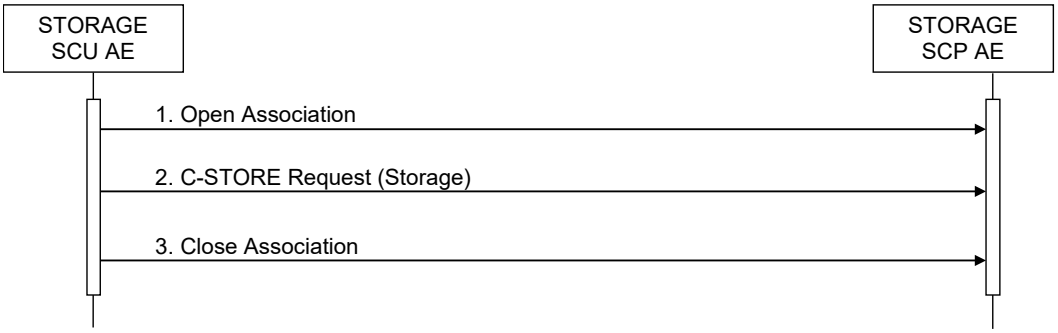

Figure 4.2-3
SEQUENCING OF ACTIVITY – SEND INSTANCES

A possible sequence of interactions between the STORAGE SCU AE and a Server (e.g. a storage or archive device supporting the Storage SOP Classes as an SCP) is illustrated in the Figure above:

1. STORAGE SCU AE opens an Association with the server.
2. Acquired instances are transmitted to the server using a Storage Request (C-STORE) and the server replies with a C-STORE response (status success).
3. STORAGE SCU AE closes the Association with the STORAGE SCP AE.

4.2.3.3.1.2. Proposed Presentation Contexts

STORAGE SCU AE will propose Presentation Contexts as shown in the following table:

Table 4.2-20
Proposed Presentation Contexts for STORAGE SCU AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	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[*1]	1.2.840.10008.1.2.4.70	SCU	None
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[*1]	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[*1]	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[*1]	1.2.840.10008.1.2.4.70	SCU	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	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[*1]	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[*1]	1.2.840.10008.1.2.4.70	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	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[*1]	1.2.840.10008.1.2.4.70	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	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[*1]	1.2.840.10008.1.2.4.70	SCU	None

Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	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*1	1.2.840.10008.1.2.4.70	SCU	None
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	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*1	1.2.840.10008.1.2.4.70	SCU	None
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	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*1	1.2.840.10008.1.2.4.70	SCU	None
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	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*1	1.2.840.10008.1.2.4.70	SCU	None
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	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*1	1.2.840.10008.1.2.4.70	SCU	None
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	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*1	1.2.840.10008.1.2.4.70	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	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*1	1.2.840.10008.1.2.4.70	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	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*1	1.2.840.10008.1.2.4.70	SCU	None
X-Ray Radio Fluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	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*1	1.2.840.10008.1.2.4.70	SCU	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.4.1.1.30	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*1	1.2.840.10008.1.2.4.70	SCU	None

Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.4.1.1.29	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[*1]	1.2.840.10008.1.2.4.70	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	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[*1]	1.2.840.10008.1.2.4.70	SCU	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	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
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	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
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	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
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	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
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	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
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	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
Stand-alone Curve Storage	1.2.840.10008.5.1.4.1.1.9	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
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	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
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	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
Stand-alone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	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

Stand-alone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	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
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Stored Print Storage (Retired)	1.2.840.10008.5.1.1.27	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		JPEG Lossless*1	1.2.840.10008.1.2.4.70	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		JPEG Lossless*1	1.2.840.10008.1.2.4.70	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		JPEG Lossless*1	1.2.840.10008.1.2.4.70	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		JPEG Lossless*1	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	SCU	None
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2	SCU	None

*1 JPEG Lossless, Non-Hierarchical, First-Order Prediction

4.2.3.3.1.2.1. Extended Negotiation

No extended negotiation is performed.

4.2.3.3.1.3. SOP Specific Conformance

4.2.3.3.1.3.1. SOP Specific Conformance for Storage SOP Classes

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

4.2.3.3.1.3.2. Presentation Context Acceptance Criterion

STORAGE SCU AE does not accept associations.

4.2.3.3.1.3.3. Response Status

STORAGE SCU AE will behave as described in the table below in response to the status returned in the C-STORE response command message.

Table 4.2-21
STORAGE C-STORE Response Status HANDLING BEHAVIOR

Service Status	Further Meaning	Status Codes	Behavior
Success	Success	0000	The SCU assumes that the SCP has successfully stored the SOP Instance.
*	*	Any other status codes.	The Association is closed using A-RELEASE-RQ.

4.2.3.4. Association Acceptance Policy

STORAGE SCU AE does not accept associations.

4.2.4. STORAGE SCP AE Specification

4.2.4.1. SOP Classes

STORAGE SCP AE provides Standard Conformance to the following DICOM SOP Classes:

Table 4.2-22
SOP Classes supported by STORAGE SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	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
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	No	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	No	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	No	Yes
X-Ray Angiographic Image Storage*	1.2.840.10008.5.1.4.1.1.12.1	No	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	No	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	No	Yes

4.2.4.2. Association Policies

4.2.4.2.1. General

STORAGE SCP AE accepts but never initiates associations.

The DICOM Standard application context name for DICOM is always proposed:

Table 4.2-23
DICOM Application Context for STORAGE SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-24
Maximum PDU size received

Maximum PDU size received	60000 bytes(Configurable)

4.2.4.2.2. Number of Associations

STORAGE SCP AE can support up to 1 Associations at a time.

Table 4.2-25
Number of Associations

Maximum number of simultaneous associations	1

4.2.4.2.3. Asynchronous Nature

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

4.2.4.2.4. Implementation Identifying Information

Table 4.2-26
DICOM Implementation Class and Version for STORAGE SCP AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VPFR_3.8

4.2.4.3. Association Initiation Policy

STORAGE SCP AE does not initiate associations.

4.2.4.4. Association Acceptance Policy

When STORAGE SCP AE accepts an association, it will respond to storage requests. If the Called AE Title does not match the preconfigured AE Title shared by all the SCPs of the application, the association will be rejected.

STORAGE SCP AE accepts associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the association request itself is rejected. It can be configured to only accept associations with certain hosts (using TCP/IP address) and/or AE Titles.

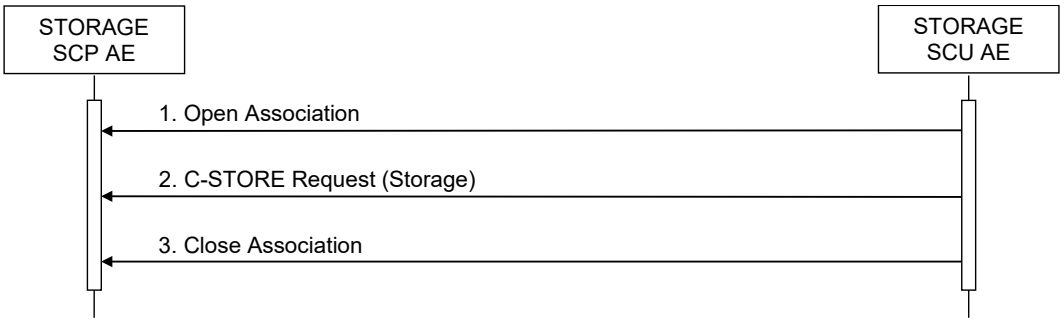

Figure 4.2-4
SEQUENCING OF ACTIVITY – STORE IMAGES TO THE LOCAL FILE SYSTEM

A possible sequence of interactions between the STORAGE SCP AE and the Server is illustrated in the Figure above:

1. STORAGE SCU AE opens an association with STORAGE SCP AE.
2. STORAGE SCU AE sends images to the STORAGE SCP AE using storage request (C-STORE) , and STORAGE SCP AE replies with a C-STORE response (status success).
3. STORAGE SCU AE closes the association with STORAGE SCP AE.

4.2.4.4.1. Activity – Receive Storage Request

4.2.4.4.1.1. Description and Sequencing of Activities

As instances are received, they are copied to the local file system and a record is inserted into the local database. If the Instance UID of received instance is a duplicate of a previously received instance, this product returns the error status "0xA702" to the remote STORAGE SCU.

4.2.4.4.1.2. Accepted Presentation Contexts

Table 4.2-27
Acceptable Presentation Contexts for STORAGE SCP AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	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*1	1.2.840.10008.1.2.4.70	SCP	None
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*1	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*1	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
		JPEG Lossless*1	1.2.840.10008.1.2.4.70	SCP	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	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*1	1.2.840.10008.1.2.4.70	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*1	1.2.840.10008.1.2.4.70	SCP	None
X-Ray Angiographic Image Storage*	1.2.840.10008.5.1.4.1.1.12.1	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*1	1.2.840.10008.1.2.4.70	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	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*1	1.2.840.10008.1.2.4.70	SCP	None

Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	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*1	1.2.840.10008.1.2.4.70	SCP	None

*1 JPEG Lossless, Non-Hierarchical, First-Order Prediction

4.2.4.4.1.2.1. Extended Negotiation

No extended negotiation is performed, though the STORAGE SCP AE is a:

— Level 2 STORAGE SCP (Full – does not discard any data elements)

4.2.4.4.1.3. SOP Specific Conformance

4.2.4.4.1.3.1. SOP Specific Conformance to Storage SOP Classes

STORAGE SCP AE provides standard conformance to the Storage Service Class.

4.2.4.4.1.3.2. Presentation Context Acceptance Criteria

STORAGE SCP AE 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.

4.2.4.4.1.3.3. Transfer Syntax Selection Policies

STORAGE SCP AE prefers Implicit 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:

a. Implicit VR Little Endian Transfer Syntax,
b. Explicit VR Little Endian Transfer Syntax.

STORAGE SCP AE 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 the Transfer Syntax to each.

4.2.4.4.1.3.4. Response Status

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

Table 4.2-28
Response Status for STORAGE SCP AE

Service Status	Further Meaning	Status Codes	Reason
Error	Data set does not match SOP Class	A900	SOP Class UID does not match.
Success		0000	Operation was performed properly.

* Mandatory DICOM Tag is the mandatory DICOM tag defined in Digital Imaging and Communications in Medicine (DICOM)

4.2.5. Q/R SCU AE Specification

4.2.5.1. SOP Classes

Q/R SCU AE provides Standard Conformance to the following DICOM SOP Classes:

Table 4.2-29
SOP Classes supported by THE Q/R 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
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

Q/R SCU AE initiates but never accepts associations.

The DICOM Standard application context name for DICOM is always proposed:

Table 4.2-30
DICOM Application Context for THE Q/R SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-31
MAXIMUM PDU SIZE RECEIVED FOR THE Q/R SCU AE

Maximum PDU size received	60000 byte(Configurable)

4.2.5.2.2. Number of Associations

Q/R SCU AE can support up to 1 Associations at a time.

Table 4.2-32
NUMBER OF ASSOCIATIONS FOR THE Q/R SCU AE

Maximum number of simultaneous associations	1

4.2.5.2.3. Asynchronous Nature

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

4.2.5.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-33
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE Q/R SCU AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VFRP_3.8

4.2.5.3. Association Initiation Policy

4.2.5.3.1. Activity – Query and Retrieve Instances

4.2.5.3.1.1. 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.

Q/R SCU AE is activated when the user selects a remote node to query and enters some key information. The user can select Study, Series and Image to be retrieved. The instances will be received at the STORAGE SCP AE.

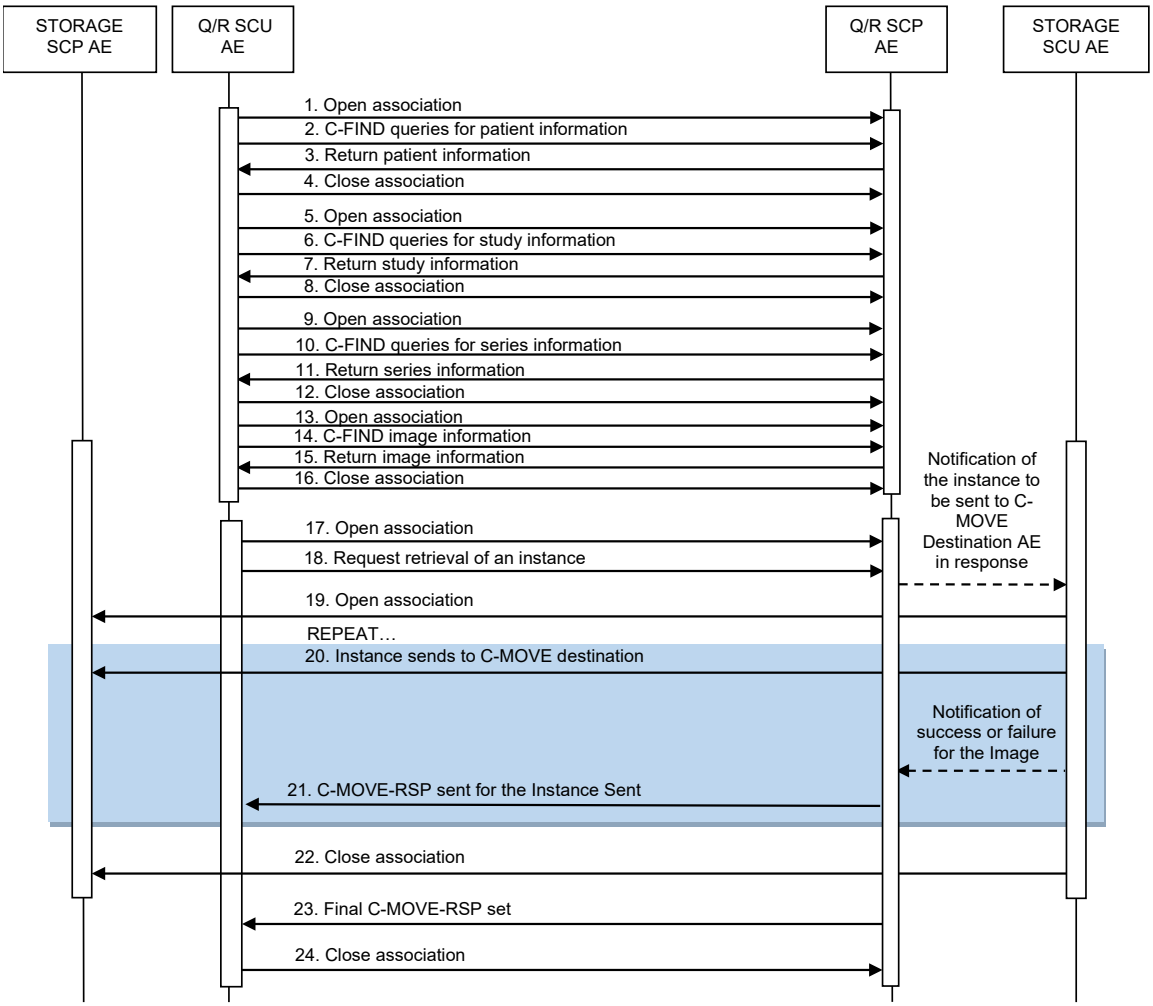

Figure 4.2-5
SEQUENCING OF ACTIVITY – QUERY AND RETRIEVE INSTANCES

The following sequencing constraints illustrated in the Figure above:

1. Q/R SCU AE opens an association with the Q/R SCP AE.
2. Q/R SCU AE sends a C-FIND-RQ Message. (Patient Level)
3. Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
4. Q/R SCU AE closes the association.
5. Q/R SCU AE opens an association with the Q/R SCP AE.
6. Q/R SCU AE sends a C-FIND-RQ Message. (Study Level)
7. Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
8. Q/R SCU AE closes the association.
9. Q/R SCU AE opens an association with the Q/R SCP AE.
10. Q/R SCU AE sends a C-FIND-RQ Message. (Series Level)
11. Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
12. Q/R SCU AE closes the association.
13. Q/R SCU AE opens an association with the Q/R SCP AE.
14. Q/R SCU AE sends a C-FIND-RQ Message. (Image Level)
15. Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
16. Q/R SCU AE closes the association.
17. Q/R SCU AE opens an association with the Q/R SCP AE.
18. Q/R SCU AE sends a C-MOVE-RQ Message. Q/R SCP AE notifies the STORAGE SCU AE to send the Composite SOP Instances to the peer MOVE Destination AE as indicated in the C-MOVE-RQ.
19. STRAGE SCU AE opens an association with the C-MOVE Destination AE.
20. STORAGE SCU AE sends instances to the MOVE Destination AE. STORAGE SCU AE indicates to the Q/R SCP AE whether the transfer succeeded or failed.
21. Q/R SCP AE then returns a C-MOVE-RSP indicating this success or failure.
22. STORAGE SCU AE closes the association.
23. Q/R SCP AE sends a final C-MOVE-RSP indicating the overall success or failure.
24. Q/R SCU AE closes the association.

4.2.5.3.1.2. Proposed Presentation Contexts

Q/R SCU AE will propose Presentation Contexts shown in the following table:

Table 4.2-34
PROPOSED PRESENTATION CONTEXTS FOR THE Q/R SCU AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.5.3.1.2.1. Extended Negotiation

No extended negotiation is performed.

In particular, relational queries are not supported.

4.2.5.3.1.3. SOP Specific Conformance

4.2.5.3.1.3.1. SOP Specific Conformance for C-FIND SOP Classes

Q/R SCU AE provides standard conformance to the supported C-FIND SOP Classes as an SCU.

Only the information model Study Root is supported.

All queries are initiated at the highest level of the information model and are then recursively repeated at the next lower level (the STUDY level, the SERIES level, and then the IMAGE level) for each response received in order to completely elucidate the “tree” of instances available on the remote AE (from which the user may subsequently request a retrieval at any level).

Requested return attributes not returned by the SCP are ignored.

Table 4.2-35
Study Root C-FIND Request Identifier for the Q/R SCU AE

Name	Tag	Types of Matching
STUDY Level		
Patient’s Name	(0010,0010)	S,*,U
Patient ID	(0010,0020)	S,*,U
Study ID	(0020,0010)	S,*,U
Study Date	(0008,0020)	S,R,*,U
Modalities in Study	(0008,0061)	*
Study Description	(0008,1030)	*
Patient’s Age	(0010,1010)	*
Study Instance UID	(0020,000D)	UNIQUE
SERIES Level		
Modality	(0008,0060)	*
Series Instance UID	(0020,000E)	UNIQUE
Series Number	(0020,0011)	*
Number of Series Related Instance	(0020,1209)	*
IMAGE Level		
Instance Number	(0020,0013)	*
SOP Instance UID	(0008,0018)	UNIQUE

Types of Matching:
The types of matching supported by the C-FIND SCU are as follows. An "S" indicates that the identifier attribute uses Single Value Matching, an “R” indicates Range Matching, an “*” indicates wildcard matching, and a ‘U’ indicates Universal Matching. “UNIQUE” indicates the Unique Key for the query level; in this case, Wildcard Matching or Single Value Matching is used, depending on the query level.

4.2.5.3.1.3.2. SOP-Specific Conformance for C-MOVE SOP Classes

Q/R SCU AE provides standard conformance to the supported C-MOVE SOP Classes.

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 STORAGE SCP AE of the local application. This implies that the remote MOVE SCP must be preconfigured to determine the presentation address corresponding to the STORAGE SCP AE. The STORAGE SCP AE will accept storage requests addressed to it from anywhere; therefore, no pre-configuration of the local application is required to accept requests from the remote AE (except appropriate configuration of FIND SCU).

Table 4.2-36
Study Root C-MOVE Request Identifier for Q/R SCU AE

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

4.2.5.3.1.3.3. Presentation Context Acceptance Criteria

Q/R SCU AE does not accept associations.

4.2.5.3.1.3.4. Response Status

Q/R SCU AE will behave as described in Table 4.2-37 in response to the status returned in the C-FIND response command message(s).

Table 4.2-37
C-FIND Response Status HANDLING BEHAVIOR

Service Status	Further Meaning	Status Codes	Behavior
Cancel	Matching terminated due to Cancel request.	FE00	Ignored (should never occur, since cancels are never issued).
Success	Matching is complete - No Final Identifier is supplied.	0000	Current query is terminated; remaining queries continue.
Pending	Matching is continuing - Current Match is supplied and Optional Keys are supported in the same manner as Required Keys.	FF00	Identifier used to populate the browser and trigger recursive lower level queries.
	Matching is continuing - Warning that one or more Optional Keys is not supported for existence and/or matching for this Identifier.	FF01	Identifier used to populate the browser and trigger recursive lower level queries.
*	*	Any other status codes.	The Association is aborted using A-RELEASE-RQ.

Q/R SCU AE will behave as described in the table below in response to the status returned in the C-MOVE response command message(s).

Table 4.2-38
C-MOVE Response Status HANDLING BEHAVIOR

Service Status	Further Meaning	Status Codes	Behavior
Cancel	Matching terminated due to Cancel request.	FE00	The C-MOVE SCU sent a Cancel Request. This has been acknowledged and the export of Composite SOP Instances to the C-MOVE Destination AE has been halted.
Success	Success	0000	Retrieval is terminated.
Pending	Sub-operations are continuing	FF00	A Response with this Status Code is sent every time a Composite SOP Instance has been successfully sent to the C-MOVE Destination AE. The information of retrieved instance will be added to the list.
*	*	Any other status codes.	The Association is closed using A-RELEASE-RQ.

4.2.5.3.1.3.5. Sub operation-dependent behavior

C-MOVE operation is dependent on the completion of C-STORE sub operations that occur on a separate association, the effects of failure of operations on the other association(s) must be considered.

Q/R SCU AE completely ignores the activities taking place in relation to the STORAGE SCP AE that is receiving the retrieved instances. Once 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 Q/R SCU AE to confirm that instances have actually been successfully received or locally stored.

Whether or not completely or partially successful retrievals are made available in the local database is beyond the control of Q/R SCU AE. The user is purely dependent on the success or failure of the C-STORE sub operations, not on any explicit action by Q/R SCU AE.

Whether or not the remote AE attempts to retry any failed C-STORE sub operations is beyond the control of Q/R SCU AE.

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 AE will continue to accept associations and storage operations regardless.

4.2.5.3.1.3.6. Association Acceptance Policy

FIND SCU and MOVE SCU do not accept associations.

4.2.6. Q/R SCP AE Specification

4.2.6.1. SOP Classes

Q/R SCP AE provides Standard Conformance to the following DICOM SOP Classes:

Table 4.2-39
SOP Classes supported by THE Q/R 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
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

Q/R SCP AE will never initiate Associations; it only accepts Association Requests from external DICOM AEs. Q/R SCP AE will accept Associations for C-FIND, and C-MOVE requests. In the case of a C-MOVE request, Q/R SCP AE will issue a command to the STORAGE-SCU AE to initiate an Association with the Destination DICOM AE to send images as specified by the originator of the C-MOVE Request.

The DICOM Standard application context name for DICOM is always proposed:

Table 4.2-40
DICOM Application Context for THE Q/R SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-41
MAXIMUM PDU SIZE RECEIVED FOR THE Q/R SCP AE

Maximum PDU size received	60000 bytes(Configurable)

4.2.6.2.2. Number of Associations

Q/R SCP AE can support up to 1 Associations at a time.

Table 4.2-42
NUMBER OF ASSOCIATIONS FOR THE Q/R SCP AE

Maximum number of simultaneous associations	1

4.2.6.2.3. Asynchronous Nature

Q/R SCP AE does not support asynchronous communication (multiple outstanding transactions over a single Association). All Association requests must be completed and acknowledged before a new operation can be initiated.

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4.2.6.2.4. Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-43
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE Q/R SCP AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VFRP_3.8

4.2.6.3. Association Initiation Policy

Q/R SCP AE does not initiate Associations.

4.2.6.4. Association Acceptance Policy

4.2.6.4.1. Activity – Query and Retrieve Instances

4.2.6.4.1.1. Description and Sequencing of Activities

Q/R SCP AE accepts Associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the Association Request itself is rejected. It can be configured to only accept Associations with certain hosts (using TCP/IP address) and AE Titles.

If Q/R SCP AE receives a query (C-FIND) request then the response(s) will be sent over the same Association used to send the C-FIND-Request.

If Q/R SCP AE receives a retrieval (C-MOVE) request then the responses will be sent over the same Association used to send the C-MOVE-Request. Q/R SCP AE will notify STORAGE SCU to send the requested SOP Instances to the C-MOVE Destination. STORAGE SCU AE notifies the Q/R SCP AE of the success or failure of each attempt to send a Composite SOP Instance to the peer C-MOVE Destination AE. Q/R SCP AE then sends a C-MOVE Response indicating this status after each attempt.
Once the STORAGE SCU AE has finished attempting to transfer all the requested SOP Instances, Q/R SCP AE sends a final C-MOVE Response indicating the overall status of the attempted retrieval.

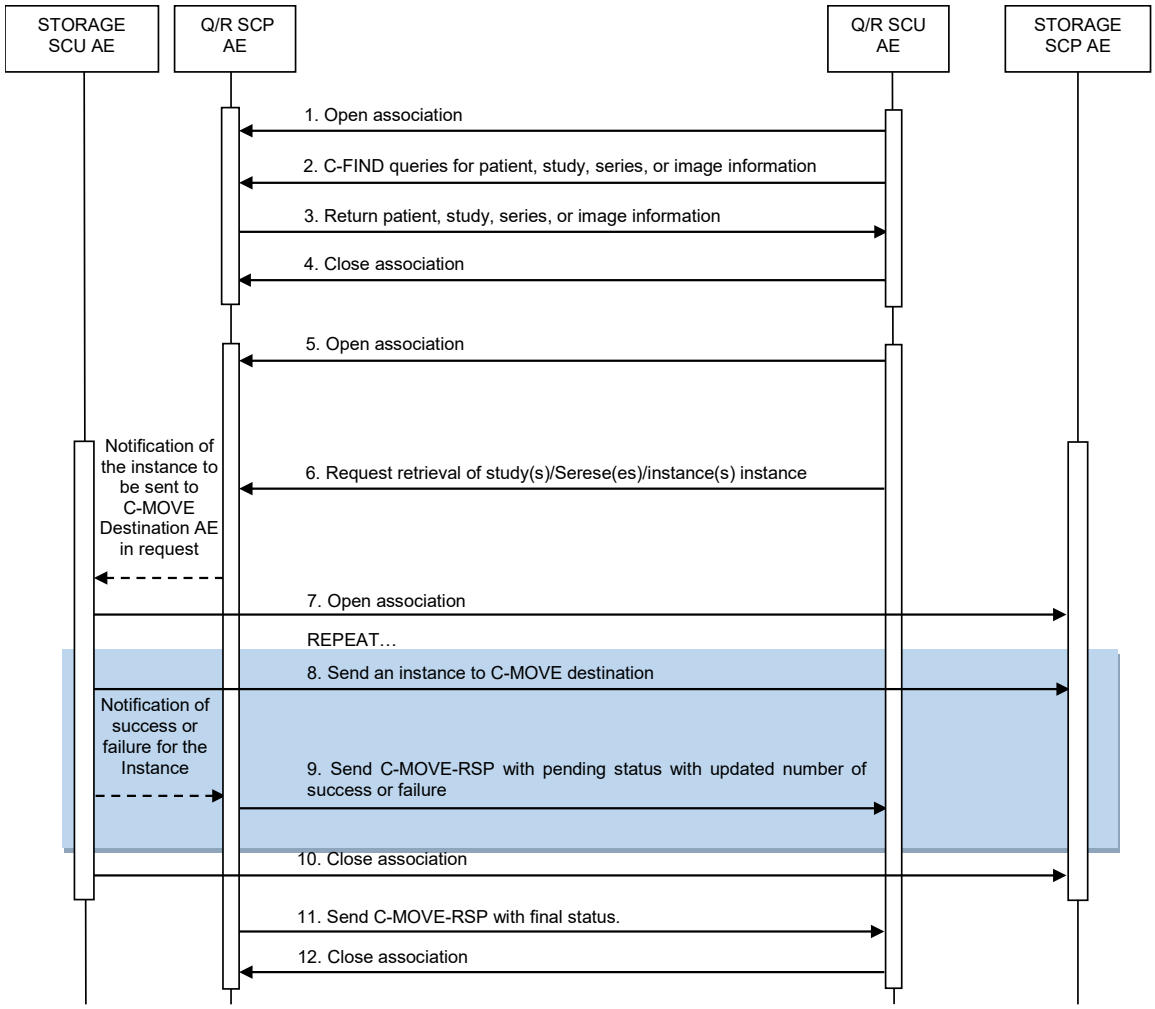

Figure 4.2-6
SEQUENCING OF ACTIVITY – HANDLING QUERY AND RETRIEVAL REQUESTS

The following sequencing constraints illustrated in the Figure above:

1. Q/R SCU AE opens an association with the Q/R SCP AE.
2. Q/R SCU AE sends a C-FIND-RQ Message.
3. Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.
4. Q/R SCU AE closes the association.
5. Q/R SCU AE opens an association with the Q/R SCP AE.
6. Q/R SCU AE sends a C-MOVE-RQ Message. Q/R SCP AE notifies the STORAGE SCU AE to send the Composite SOP Instances to the peer C-MOVE Destination AE as indicated in the C-MOVE-RQ.
7. STORAGE SCU AE opens an association with the C-MOVE Destination AE.
8. STORAGE SCU AE sends instances to the C-MOVE Destination AE. STORAGE SCU AE indicates to the Q/R SCP AE whether the transfer succeeded or failed.
9. Q/R SCP AE sends a C-MOVE-RSP indicating this success or failure.
10. STORAGE SCU AE closes the association.
11. Q/R SCP AE sends a final C-MOVE-RSP indicating the overall success or failure.
12. Q/R SCU AE closes the association.

4.2.6.4.1.2. Proposed Presentation Contexts

Q/R SCP AE will propose Presentation Contexts shown in the following table:

Table 4.2-44
PROPOSED PRESENTATION CONTEXTS FOR THE Q/R SCP AE

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.6.4.1.3. SOP Specific Conformance for Query SOP Classes

Q/R SCP AE supports hierarchical queries and not relational queries. Those attributes requested in the query identifier are returned.

Study Root Information Model

All the required search keys on each of the three levels (Study, Series, and Image) are supported.

Table 4.2-45
Study Root Request Identifier for the Q/R SCP AE

Name	Tag	Types of Matching
SOP Common		
Specific Character Set	(0008,0005)	None
STUDY Level		
Patient's Name	(0010,0010)	S,*,U
Patient ID	(0010,0020)	S,*,U
Study ID	(0020,0010)	S,U
Study Date	(0008,0020)	R,U
Modalities in Study	(0008,0061)	S,U,L
Study Description	(0008,1030)	S,*,U
Patient's Age	(0010,1010)	S,*,U
Study Instance UID	(0020,000D)	S,U,L
SERIES Level		
Modality	(0008,0060)	S,U
Series Instance UID	(0020,000E)	S,U,L
Series Number	(0020,0011)	S,*,U
Number of Series Related Instance	(0020,1209)	S,*,U
IMAGE Level		
Instance Number	(0020,0013)	S,*,U
SOP Instance UID	(0008,0018)	S,U,L

Types of Matching:
The types of Matching supported by the C-FIND SCP. A "S" indicates the identifier attribute can specify Single Value Matching, a "R" will indicate Range Matching, a "*" will denote wildcard matching, an 'U' will indicate universal matching, and 'L' will indicate that UID lists are supported for matching. "NONE" indicates that no matching is supported.

4.2.6.4.1.3.1. Response Status

Q/R SCP AE will behave as described in Table 4.2-46 in response to the status returned in the C-FIND response.

Table 4.2-46
Q/R SCP AE C-FIND RESPONSE STATUS RETURN BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Success	0000	Matching is complete or Matching is reached to the maximum number of records to be returned. No final identifier is supplied.
Refused	Out of Resources	A700	Out of System resources.
Failed	Identifier does not match SOP Class	A900	The C-FIND query identifier contains invalid Elements or values, or is missing mandatory Elements or values for the specified SOP Class. Error message is output to the Service Log.
	Unable to process	C001	The C-FIND query identifier is valid for the specified SOP Class but cannot be used to query the database. Error message is output to the Service Log.
Pending	Matches are continuing and current match is supplied.	FF00	Indicates that the search for further matches is continuing. This is returned when each successful match is returned and when further matches are forthcoming. This status code is returned if all Optional keys in the query identifier are actually supported.

4.2.6.4.1.4. SOP Specific Conformance for Retrieval SOP Classes

Q/R SCP AE will convey to the STORAGE SCU AE that an Association with a DICOM AE named by the external C-MOVE SCU (through a MOVE Destination AE Title) should be established. It will also convey to the STORAGE SCU AE to perform C-STORE operations on specific images requested by the external C-MOVE SCU.

An initial C-MOVE Response is always sent after confirming that the C-MOVE Request itself can be processed. After this, the QUERY-RETRIEVE-SCP AE will return a response to the C-MOVE SCU after the STORAGE SCU AE has attempted to send each image.

Table 4.2-47
Q/R SCP AE C-MOVE RESPONSE STATUS RETURN BEHAVIOR

Service Status	Further Meaning	Error Code	Behavior
Success	Sub-operations complete – No Failures	0000	All the Composite SOP Instances have been successfully sent to the C-MOVE Destination AE.
Refused	Out of Resources – Unable to calculate number of matches	A701	Number of matches cannot be determined due to system failure. Error message is output to the Service Log.
	Out of Resources – Unable to perform sub-operations	A702	C-STORE sub-operations cannot be performed due to failure to access Composite SOP Instances in archive, or failure of a C-STORE Request. Error message is output to the Service Log.
	Move destination unknown	A801	The Destination AE named in the C-MOVE Request is unknown to Query-Retrieve SCP AE. Error message is output to the Service Log.
Failed	Identifier does not match SOP Class	A900	The C-MOVE identifier contains invalid Elements or values, or is missing mandatory Elements or values for the specified SOP Class or retrieval level. Error message is output to the Service Log.
Warning	Suboperations Complete – One or more Failures	B000	Image transmission is considered successful. It will send the appropriate PENDING or SUCCESS Status in the C-MOVE Response. Warning message is output to the Service Log.
Pending	Sub-operations are continuing	FF00	A Response with this Status Code is sent every time a Composite SOP Instance has been successfully sent to the C-MOVE Destination AE.

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Table 4.2-48
Q/R SCP AE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout expiry for an expected DICOM Message Request (DIMSE level timeout). I.e. Q/R SCP AE is waiting for the next C-FIND or C-MOVE Request on an open Association but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is output to the Service Log.
Timeout expiry for an expected DICOM PDU or TCP/IP packet (Low-level timeout). I.e. Q/R SCP AE is waiting for the next message PDU but the timer expires.	The Association is aborted by issuing a DICOM A-ABORT. Error message is output to the Service Log.
Association aborted by the SCU or the network layers indicate communication loss (i.e. low-level TCP/IP socket closure)	Error message is output to the Service Log.

4.2.7. Print SCU AE Specification

4.2.7.1. SOP Classes

Print SCU AE provides Standard Conformance to the following Meta SOP Classes:

Table 4.2-49
META SOP CLASSES FOR PRINT SCU AE

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

The above Meta SOP Classes are defined by the following set of supported SOP Classes:

Table 4.2-50
SOP Classes for PRINT SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1	Yes	No
Basic film Box SOP Class	1.2.840.10008.5.1.1.2	Yes	No
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4	Yes	No
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1	Yes	No
Printer SOP Class	1.2.840.10008.5.1.1.16	Yes	No

4.2.7.2. Association Policies

4.2.7.2.1. General

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

Table 4.2-51
DICOM Application Context for PRINT SCU AE

Application Context Name	1.2.840.10008.3.1.1.1

Table 4.2-52
MAXIMUM PDU SIZE RECEIVED FOR PRINT SCU AE

Maximum PDU size received	60000 bytes(Configurable)

4.2.7.2.2. Number of Associations

Table 4.2-53
Number of Associations Accepted for PRINT SCU AE

Maximum number of simultaneous Associations	1

4.2.7.2.3. Asynchronous Nature

Print SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

Table 4.2-54
Asynchronous Nature for PRINT SCU AE

Maximum number of outstanding asynchronous transactions	1

4.2.7.2.4. Implementation Identifying Information

The implementation information for Print SCU AE is:

Table 4.2-55
DICOM Implementation Class and Version for PRINT SCU AE

Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VFRP_3.8

4.2.7.3. Association Initiation Policy

4.2.7.3.1. Activity – Send Images & Print Management Information

4.2.7.3.1.1. Description and Sequencing of Activities

A user composes images onto film sheets and requests them to be sent to a specific hardcopy device. The user can select the desired film format and number of copies.

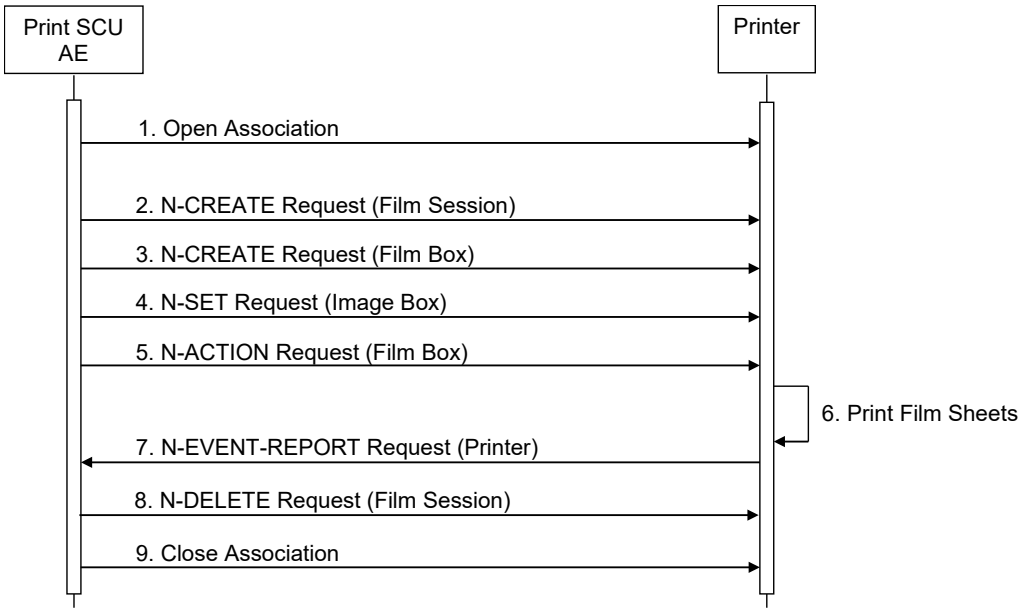

Figure 4.2-7
Sequencing of Activity – SEND Images & PRINT MANAGEMENT INFORMATION

A typical sequence of DIMSE messages sent over an association between the Print SCU AE and a Printer is illustrated in the Figure above:

1. Print SCU AE opens an Association with Printer.
2. N-CREATE on the Film Session SOP Class creates a Film Session.
3. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session.
4. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.
5. N-ACTION on the Film Box SOP Class instructs the Printer to print the Film Box.
6. Printer prints the requested number of film sheets.
7. Printer asynchronously reports its status via N-EVENT-REPORT notification (Printer SOP Class). The printer can send this message at any time. Print SCU AE does not require the N-EVENT-REPORT to be sent. Print SCU AE is capable of receiving an N-EVENT-REPORT notification at any time during an association.
8. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP Instance hierarchy.
9. Print SCU AE closes the Association with Printer.

4.2.7.3.1.2. Proposed Presentation Contexts

Print SCU AE is capable of proposing the Presentation Contexts shown in the Table below:

Table 4.2-56
Proposed Presentation Contexts for Activity
SEND Images & PRINT MANAGEMENT INFORMATION

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.3.1.3. Common SOP Specific Conformance for all Print SOP Classes

The general behavior of the Print SCU AE during communication failure is summarized in the Table below. This behavior is common for all SOP Classes supported by the Print SCU AE.

Table 4.2-57
PRINT Communication Failure Behavior

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and the print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.
Association aborted by the SCP or network layers	The print-job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application.

4.2.7.3.1.4. SOP Specific Conformance for Printer SOP Class

Print SCU AE supports the following DIMSE operations and notifications for the Printer SOP Class:

— N-EVENT-REPORT

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.7.3.1.4.1. Printer SOP Class Notifications (N-EVENT-REPORT)

Print SCU AE is capable of receiving an N-EVENT-REPORT request at any time during an association.

The behavior of The Print SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below:

Table 4.2-58
Printer SOP Class N-EVENT-REPORT Behavior

Event Type Name	Event Type ID	Behavior
Normal	1	The print-job continues to be printed.
Warning	2	The print-job continues to be printed.
Failure	3	The print-job continues to be printed.
*	*	The print-job continues to be printed.

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

Table 4.2-59
Printer SOP Class N-EVENT-REPORT Response Status Reasons

Service Status	Further Meaning	Status Code	Reasons
Success	Success	0000	The notification event has been successfully received.

4.2.7.3.1.5. SOP Specific Conformance for the Film Session SOP Class

Print SCU AE supports the following DIMSE operations for the Film Session SOP Class:

— N-CREATE

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.7.3.1.5.1. Film Session SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

Table 4.2-60
Film Session SOP Class N-CREATE Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Copies	(2000,0010)	IS	1	ALWAYS	Auto
Print Priority	(2000,0020)	CS		ALWAYS	User
Medium Type	(2000,0030)	CS		ALWAYS	User
Film Destination	(2000,0040)	CS		ALWAYS	User
Film Session Label	(2000,0050)	CS	“VirtualPlace”	ALWAYS	Auto

The behavior of Print SCU AE when encountering status codes in an N-CREATE response is summarized in the Table below:

Table 4.2-61
Film Session SOP Class N-CREATE Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
*	*	Any other status code	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.7.3.1.6. SOP Specific Conformance for the Film Box SOP Class

Print SCU AE supports the following DIMSE operations for the Film Box SOP Class:

— N-CREATE
— N-ACTION

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.7.3.1.6.1. Film Box SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

Table 4.2-62
Film Box SOP Class N-CREATE Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Film Size ID	(2010,0050)	CS		ALWAYS	User
Magnification Type	(2010,0060)	CS		ALWAYS	User
Border Density	(2010,0100)	CS		ALWAYS	User
Empty Image Density	(2010,0110)	CS		ALWAYS	User
Min Density	(2010,0120)	US		ANAP	User
Max Density	(2010,0130)	US		ANAP	User
Trim	(2010,0140)	CS		ALWAYS	User

The behavior of Print SCU AE when encountering status codes in an N-CREATE response is summarized in the Table below:

Table 4.2-63
Film Box SOP Class N-CREATE Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Warning	Requested Min Density or Max Density outside of printer's operating range	B605	The N-CREATE operation is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code.	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.7.3.1.6.2. Film Box SOP Class Operations (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box.

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

Table 4.2-64
Film Box SOP Class N-ACTION Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. The film has been accepted for printing.
Warning	Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)	B603	The N-ACTION operation is considered successful if it is configured that the status would be considered successful.
Warning	Image size is larger than Image Box size. The image has been damaged.	B604	The N-ACTION operation is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.7.3.1.7. SOP Specific Conformance for the Grayscale Image Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Grayscale Image Box SOP Class:

— N-SET

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.7.3.1.7.1. Grayscale Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the Table below:

Table 4.2-65
Grayscale Image Box SOP Class N-SET Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US		ALWAYS	Auto
Basic Grayscale Image Sequence	(2020,0110)	SQ		ALWAYS	Auto
>Samples Per Pixel	(0028,0002)	US	1	ALWAYS	Auto
>Photometric Interpretation	(0028,0004)	CS	MONOCHROME2	ALWAYS	Auto
>Rows	(0028,0010)	US		ALWAYS	Auto
>Columns	(0028,0011)	US		ALWAYS	Auto
>Pixel Aspect Ratio	(0028,0034)	IS	1\1	ALWAYS	Auto
>Bits Allocated	(0028,0100)	US	8	ALWAYS	Auto
>Bits Stored	(0028,0101)	US	8	ALWAYS	Auto
>High Bit	(0028,0102)	US	7	ALWAYS	Auto
>Pixel Representation	(0028,0103)	US	0	ALWAYS	Auto
>Pixel Data	(7FE0,0010)	OB		ALWAYS	Auto

The behavior of Print SCU AE when encountering status codes in an N-SET response is summarized in the Table below:

Table 4.2-66
GRAYSCALE Image Box SOP Class N-SET Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
Warning	Image size is larger than Image Box size. The image has been damaged.	B604	The N-SET operation is considered successful if it is configured that the status would be considered successful.
Warning	Requested Min Density or Max Density outside of printer's operating range.	B605	The N-SET operation is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.7.3.1.8. SOP Specific Conformance for the Color Image Box SOP Class

Print SCU AE supports the following DIMSE operations for the Color Image Box SOP Class:

— N-SET

Details of the supported attributes and status handling behavior are described in the following subsections.

4.2.7.3.1.8.1. Color Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the Table below:

Table 4.2-67
COLOR Image Box SOP Class N-SET Request Attributes

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Position	(2020,0010)	US		ALWAYS	Auto
Basic Color Image Sequence	(2020,0111)	SQ		ALWAYS	Auto
>Samples Per Pixel	(0028,0002)	US	3	ALWAYS	Auto
>Photometric Interpretation	(0028,0004)	CS	RGB	ALWAYS	Auto
>Planar Condition	(0028,0006)	US	0	ALWAYS	Auto
>Rows	(0028,0010)	US		ALWAYS	Auto
>Columns	(0028,0011)	US		ALWAYS	Auto
>Pixel Aspect Ratio	(0028,0034)	IS	1\1	ALWAYS	Auto
>Bits Allocated	(0028,0100)	US	8	ALWAYS	Auto
>Bits Stored	(0028,0101)	US	8	ALWAYS	Auto
>High Bit	(0028,0102)	US	7	ALWAYS	Auto
>Pixel Representation	(0028,0103)	US	0	ALWAYS	Auto
>Pixel Data	(7FE0,0010)	OB		ALWAYS	Auto

The behavior of Print SCU AE when encountering status codes in a N-SET response is summarized in the Table below:

Table 4.2-68
COLOR Image Box SOP Class N-SET Response Status Handling Behavior

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully. Image successfully stored in Image Box.
Warning	Image size is larger than Image Box size. The image has been damaged.	B604	The N-SET operation is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code	The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user.

4.2.7.4. Association Acceptance Policy

Print SCU AE does not accept Associations.

4.3. NETWORK INTERFACES

4.3.1. Physical Network Interface

This product supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options

Table 4.3-1
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 1000baseT
Ethernet 100baseTX
Ethernet 10baseT

4.3.2. Additional Protocols

None.

4.4. CONFIGURATION

All configurations are performed through the use of INI file(s) stored in predefined locations that are specific to the underlying operating system.

4.4.1. AE Title/Presentation Address Mapping

The Calling AE Title of the local application is configurable in the preferences file and is shared by all the AEs. The mapping of the logical name, by which remote AEs are described in the user interface to Called AE Titles and of the presentation address (hostname or IP address and port number) is configurable in the preferences file.

4.4.1.1. Local AE Titles

The mapping from AE Title to TCP/IP addresses and ports is configurable and set at the time of installation by Installation Personnel.

Table 4.4-1
AE TITLE CONFIGURATION TABLE

Application Entity	Role	Default AE Title	Default TCP/IP Port
Verification SCU	SCU	VPFR101	Not Applicable
Verification SCP	SCP		104
STORAGE SCU	SCU		Not Applicable
STORAGE SCP	SCP		104
Q/R SCU	SCU		Not Applicable
Q/R SCP	SCP		104
Print SCU	SCU		Not Applicable

4.4.2. Parameters

Table 4.4-2
CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)[Range]	Default Value
Local AE Configuration		
IP Address	Yes	-
AE Title	Yes	VPFR101
TCP/IP Port number.	Yes	104
PDU Length	Yes [1-60000]	60000
Time-out waiting for an acceptance or rejection response to an Association Request (Application Level Timeout)	No	60 (sec)
Time-out waiting for a response to an Association release request (Application Level Timeout)	No	60 (sec)
Time-out waiting for a response to a DIMSE Request (Low-Level Timeout)	No	60 (Sec)
Remote AE Configuration		
Display Name	Yes	-
AE Title	Yes	-
IP Address	Yes	-
TCP/IP Port number.	Yes	-
PDU Length	Yes [1-60000]	-
Time-out waiting for an acceptance or rejection response to an Association Request (Application Level Timeout)	No	60 (sec)
Time-out waiting for a response to an Association release request (Application Level Timeout)	No	60 (sec)
Time-out waiting for a response to a DIMSE Request (Low-Level Timeout)	No	60 (Sec)

5 MEDIA INTERCHANGE

5.1. IMPLEMENTATION MODEL

5.1.1. Application Data Flow

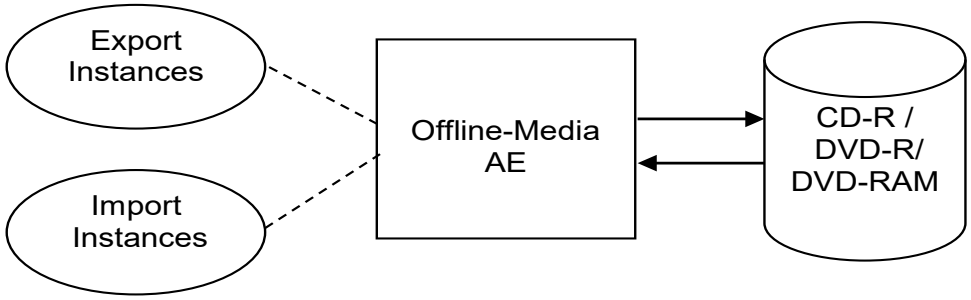

Figure 5.1-1
APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE

— The Offline-Media AE exports instances to a CD-R, DVD-R and DVD-RAM Storage medium. It is associated with the local real-world activity "Export Instances" performed upon user request.
— The Offline-Media AE imports instances from a CD-R, DVD-R and DVD-RAM Storage medium. It is associated with the local real-world activity "Import Instances" performed upon user request.

5.1.2. Functional Definition of AEs

5.1.2.1. Functional Definition of Offline-Media AE

The Offline-Media AE is performed upon user request for selected instances to/from an offline DICOM CD-R, DVD-R and DVD-RAM medium. It therefore performs the following tasks:

Export:

— Builds DICOM Information Objects.
— Creates a DICOMDIR file that represents the contents of the DICOM Information Objects to be recorded.
— Records DICOM Information Objects and the DICOMDIR file to the CD-R, DVD-R or DVD-RAM medium.

Import:

— Reads the DICOMDIR file that represents the contents of the data as recorded.
— Displays the ordered list of instances, identifying information.
— Loads the selected instances from the CD-R, DVD-R or DVD-RAM medium and displays them on the screen.

5.1.3. Sequencing of Real-World Activities

5.1.3.1. Activity – Export Instances

Operator requests to create new File-set(s) onto a new CD-R, a new DVD-R or a new DVD-RAM medium. The requests are placed in a queue and are executed in the background.

The operations for "Export" are described below:

Step-1: Select the instance(s) on the local storage device to be created to the medium.

Step-2: Select the Media device as a destination.

Step-3: Request to copy to the medium.

5.1.3.2. Activity – Import Instances

Operator requests to retrieve File-set(s) on the CD-R, DVD-R or DVD-RAM medium. The requests are placed in a queue and are executed in the background.

The operations for "Import Instances" are described below:

Step-1: Select the instances on the medium to be retrieved to the local storage device.

Step-2: Request to copy to the local storage device.

5.1.4. File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is:

Table 5.1-1
DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

File Meta Information Version	1
Implementation Class UID	1.2.392.200103.1.1
Implementation Version Name	VFRP_3.8

5.2. AE SPECIFICATIONS

5.2.1. Offline-Media AE Specification

The Offline-Media AE provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed below:

Table 5.2-1
APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD, STD-GEN-DVD-JPEG, STD-GEN-DVD-RAM	Export Instances	FSC	Interchange
STD-GEN-CD, STD-GEN-DVD-JPEG, STD-GEN-DVD-RAM	Import Instances	FSR	Interchange

5.2.1.1. File Meta Information for the Application Entity

The Source Application Entity Title is the local AE title of Storage SCP.

5.2.1.2. Real-World Activities

5.2.1.2.1. Activity – Export Instances

The Offline-Media AE acts as an FSC using the interchange option when requested to export SOP Instances from the local database to a CD-R, DVD-R and DVD-RAM medium.

5.2.1.2.1.1. Media Storage Application Profiles

The Offline-Media AE supports the STD-GEN-CD, STD-GEN-DVD-JPEG, and STD-GEN-DVD-RAM Application Profiles.

5.2.1.2.1.1.1. Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in Table 5.3-1.

5.2.1.2.2. Activity – Import Instances

The Offline-Media AE acts as an FSR using the interchange option when requested to import SOP Instances from a CD-R, DVD-R and DVD-RAM medium to the local database.

5.2.1.2.2.1. Media Storage Application Profiles

The Offline-Media AE supports the STD-GEN-CD, STD-GEN-DVD-JPEG and STD-GEN-DVD-RAM Application Profiles.

5.2.1.2.2.1.1. Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in Table 5.3-1.

5.3. STANDARD APPLICATION PROFILES

5.3.1. Standard Application Profiles

5.3.1.1. Standard Application Profiles – STD-GEN-CD, STD-GEN-DVD-JPEG, STD-GEN-DVD-RAM

5.3.1.1.1. SOP Class Augmentations

The Augmented Application Profiles support the following SOP Classes and Transfer Syntaxes:

Table 5.3-1
SOP CLASS STANDARD FOR STD-GEN-CD, STD-GEN-DVD-JPEG STD-GEN-DVD-RAM

Information Object Definition	SOP Class UID	Transfer Syntax	Transfer Syntax UID
DICOM Media Storage Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Digital X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Digital Mammography X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Digital Mammography X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70

X-Ray Radio Fluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Hardcopy Color Image Storage	1.2.840.10008.5.1.4.1.1.30	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.4.1.1.29	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian	1.2.840.10008.1.2.1
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Explicit VR Little Endian	1.2.840.10008.1.2.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian	1.2.840.10008.1.2.1
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Explicit VR Little Endian	1.2.840.10008.1.2.1
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Explicit VR Little Endian	1.2.840.10008.1.2.1
Stand-alone Curve Storage	1.2.840.10008.5.1.4.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
Stand-alone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Explicit VR Little Endian	1.2.840.10008.1.2.1
Stand-alone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Explicit VR Little Endian	1.2.840.10008.1.2.1
Stand-alone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	Explicit VR Little Endian	1.2.840.10008.1.2.1
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Explicit VR Little Endian	1.2.840.10008.1.2.1
Stored Print Storage (Retired)	1.2.840.10008.5.1.1.27	Explicit VR Little Endian	1.2.840.10008.1.2.1
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1
		JPEG Lossless*1	1.2.840.10008.1.2.4.70
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Explicit VR Little Endian	1.2.840.10008.1.2.1

Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Explicit VR Little Endian	1.2.840.10008.1.2.1
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian	1.2.840.10008.1.2.1

*1 JPEG Lossless, Non-Hierarchical, First-Order Prediction

5.3.1.1.2. Directory Augmentations

Not applicable.

5.3.1.1.3. Other Augmentations

Not applicable.

5.3.2. Private Application Profiles

Not applicable.

5.4. MEDIA CONFIGURATION

Not applicable.

6 SUPPORT OF CHARACTER SETS

This product supports the following character sets:

ISO-IR 6(default) (Basic G0 set)	ISO 646
ISO 2022 IR 87 (Japanese kanji, hiragana, and katakana)	JIS X 0208 (Kanji)

7 SECURITY

7.1. SECURITY PROFILES

Not supported.

7.2. ASSOCIATION LEVEL SECURITY

Not supported.

7.3. APPLICATION LEVEL SECURITY

Not supported.

8 ANNEXES

8.1. IOD CONTENTS

8.1.1. Created SOP Instances

Instances processed by Virtual Place is created. Tags Virtual Place to create shown in Table8.1-1.
Other Tag information dose not changed.

Table 8.1-1
CREATED TAG FOR VIRTUALPLACE

Attribute Name	Tag	VR	Value	Presence of Value	Source
Image Type	(0008,0008)	CS	“DERIVED\SECONDARY”	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	“1.2.840.10008.5.1.4.1.1.7”	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Generated by device	ALWAYS	AUTO

8.1.2. Usage of Attributes from Received IODs

No SOP-Class-specific fields are required.

The local database and the remote query and directory browsers make use of conventional identification attributes to distinguish patients, studies, series, and instances. In particular, if two patients have the same value for the Patient ID, they will be treated as the same patient in the browser and the local database.

8.1.3. Attribute Mapping

Not applicable to this product.

8.1.4. Coerced/Modified Fields

No coercion is performed.

8.2. DATA DICTIONARY OF PRIVATE ATTRIBUTES

Not supported.

8.3. PRIVATE TRANSFER SYNTAXES

Not supported.