

OptosAdvance DICOM Conformance Statement

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1. Conformance Statement Overview

1.1. Overview

The OptosAdvance application supports DICOM storage/commitment/query/retrieve for both SCU and SCP roles, it also implements the WADO-RS/STOW-RS/QIDO-RS services as both User of Service (client) and Provider of Service (server) roles and WADO-URI/WADO-WS as User Of Service role. All of the networking, database, and other services are provided by the OptosAdvance. This conformance claim refers to the conformance claim for the OptosAdvance for all such services.

The application is capable of storing, sending, querying, retrieving and displaying:

1.1.1 Image storage SOP Classes:

- Color Softcopy Presentation State Storage SOP Class
- Comprehensive SR Storage
- Encapsulated CDA Storage
- Encapsulated PDF Storage
- Enhanced SR Storage
- Grayscale Softcopy Presentation State Storage SOP Class
- Key Object Selection Document Storage
- Multi-frame Grayscale Byte Secondary Capture Image Storage
- Multi-frame Grayscale Word Secondary Capture Image Storage
- Multi-frame True Color Secondary Capture Image Storage
- Ophthalmic Photography 16 Bit Image Storage
- Ophthalmic Photography 8 Bit Image Storage
- Ophthalmic Tomography Image Storage
- Secondary Capture Image Storage
- Video Photographic Image Storage
- VL Photographic Image Storage
- Wide Field Ophthalmic Photography Stereographic Projection Image Storage

1.1.2 Image pixel interpretations:

- Grayscale images (MONOCHROME1, MONOCHROME2)
- Palette color (PALETTE COLOR)
- Color (RGB, YBR_FULL, YBR_FULL_422, YBR_PARTIAL_422)

1.1.3 Transfer Syntaxes:

- Implicit VR Little Endian

- Explicit VR Little Endian
- Explicit VR Big Endian
- JPEG Lossy coding process 1, 2, 4
- JPEG Lossless coding process 14
- JPEG 2000 Lossy and Lossless
- RLE Lossless

**Table 1.1-1
NETWORK SERVICES**

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Color Softcopy Presentation State Storage SOP Class	Yes	Yes
Comprehensive SR Storage	Yes	Yes
Encapsulated CDA Storage	Yes	Yes
Encapsulated PDF Storage	Yes	Yes
Enhanced SR Storage	Yes	Yes
Grayscale Softcopy Presentation State Storage SOP Class	Yes	Yes
Key Object Selection Document Storage	Yes	Yes
Multi-frame Grayscale Byte Secondary Capture Image Storage	Yes	Yes
Multi-frame Grayscale Word Secondary Capture Image Storage	Yes	Yes
Multi-frame True Color Secondary Capture Image Storage	Yes	Yes
Ophthalmic Photography 16 Bit Image Storage	Yes	Yes
Ophthalmic Photography 8 Bit Image Storage	Yes	Yes
Ophthalmic Tomography Image Storage	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Video Photographic Image Storage	Yes	Yes
VL Photographic Image Storage	Yes	Yes
Wide Field Ophthalmic Photography Stereographic Projection Image Storage	Yes	Yes

Storage Commitment		
Storage Commitment Push Model	Yes	Yes
Query/Retrieve		
Study Root Information Model FIND	Yes	Yes
Patient Root Information Model FIND	Yes	Yes
Study Root Information Model MOVE	Yes	Yes
Patient Root Information Model MOVE	Yes	Yes
WADO-URI - Retrieve Imaging Document	Yes	No
WADO-WS - Retrieve Imaging Document Set	Yes	No
WADO - RS - Retrieve Study	Yes	Yes
WADO - RS - Retrieve Series	Yes	Yes
WADO - RS - Retrieve Frames	Yes	Yes
WADO - RS - Retrieve Metadata	Yes	Yes
STOW-RS Store Instances	Yes	Yes
QIDO-RS Search for Studies	Yes	Yes
QIDO-RS Search for Series	Yes	Yes
QIDO-RS Search for Instances	Yes	Yes
General		
Verification	No	Yes

**Table 1.1-2
MEDIA SERVICES**

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
Not Applicable		

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3. Introduction

This document is the DICOM Conformance Statement for the Nil Read application. It describes compliance with the DICOM Version 3.0 standard including supported DICOM Service Classes, Information Objects and Communication Protocols

3.1.Intended Audience

The Conformance Statement is intended for use by software developers of DICOM interfaces, customers and system integrator who wish to connect DICOM equipment with the Nil Read DICOM connectivity modules.

3.2.Remarks

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

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.

3.3.Terms and Definitions

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

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.

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

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/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification.
Example: 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.

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.

3.4. Abbreviations

AE Application Entity

DICOM Digital Imaging and Communications in Medicine

FSC File-Set Creator

FSU File-Set Updater

FSR File-Set Reader

IOD Information Object Definition

JPEG Joint Photographic Experts Group

OP Ophthalmic Photography

OPT Ophthalmic Tomography

SC Secondary Capture

SOP Service-Object Pair

WADO Web access to DICOM persistent Objects



STOW Store Over the Web by RESTful services

QIDO Query based on ID for DICOM Objects by RESTful Services

RS RESTful services

XML eXtensible Markup Language

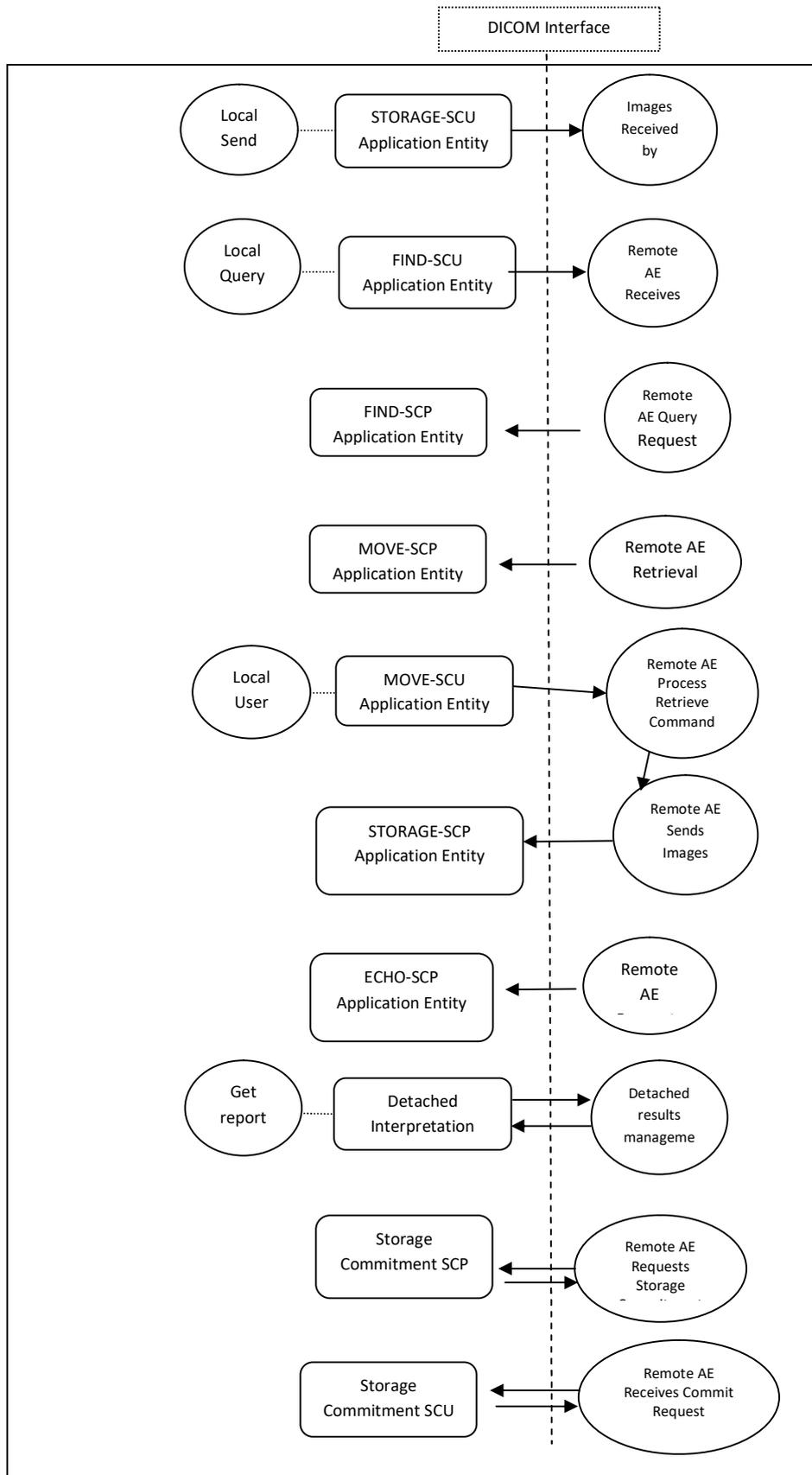
4. Networking

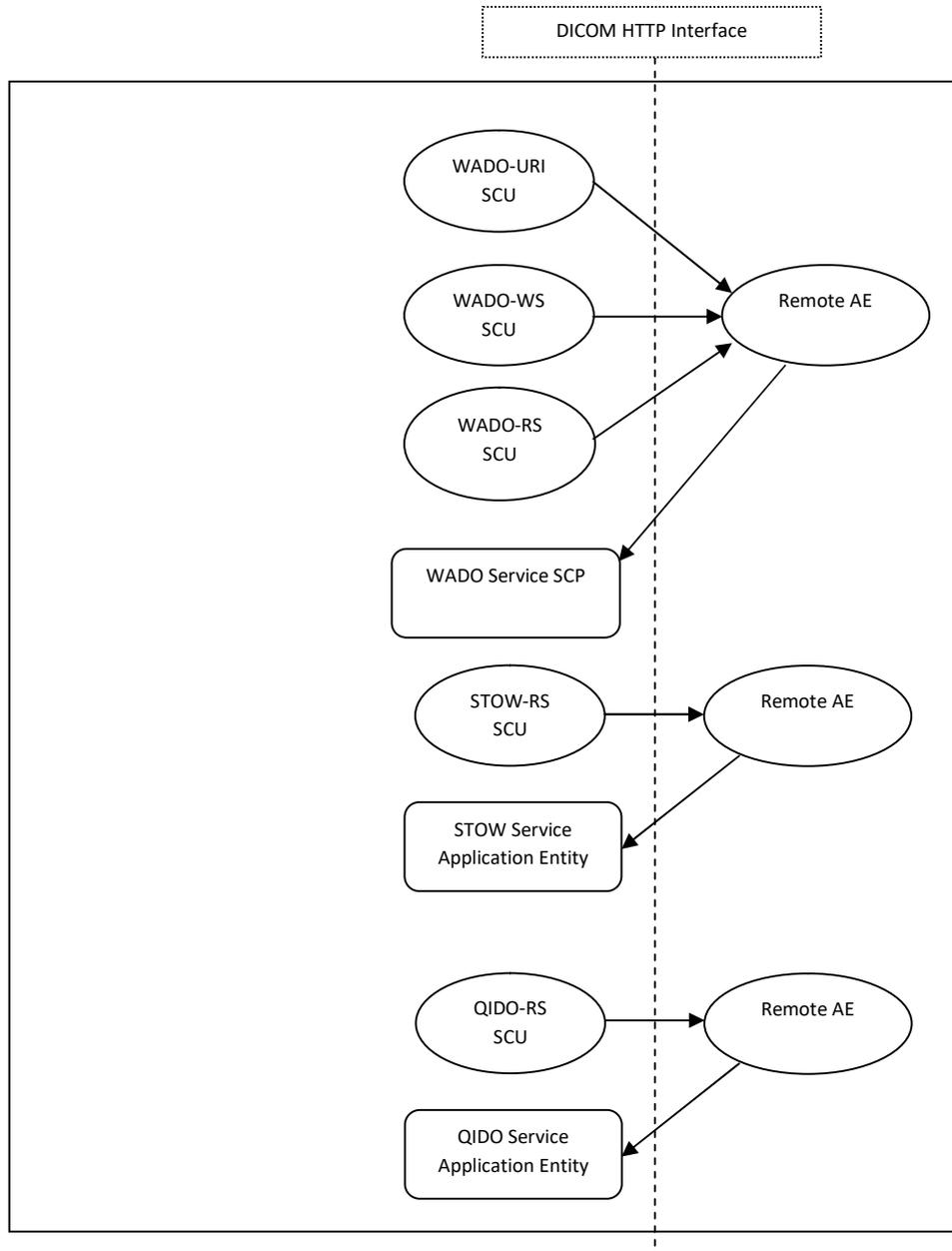
4.1. Implementation Model

4.1.1. Application Data Workflow

The application is a .NET application that provides a user interface, internal database and network listener that spawns additional threads as necessary to handle incoming connections. Conceptually, the network services may be modeled as the following separate AEs, though in fact all the AEs share a single (configurable, 'NILAE' by default) AE Title:

- ECHO-SCP, which responds to verification requests
- STORAGE-SCP, which receives incoming composite instances
- STORAGE-SCU, which sends outbound composite instances
- COMMIT-SCU, which determines successful storage of DICOM instances
- COMMIT-SCP, which provides confirmation of storage of DICOM instances
- FIND-SCU, which queries remote AEs for lists of studies
- FIND-SCP, which processes incoming queries for lists of DICOM entities
- MOVE-SCU, which retrieves list of studies from the remote AEs
- MOVE-SCP, which responses for requests of DICOM entities retrievals
- Detached Interpretation Management Service Class as SCU, which gets/receives detached interpretation report and notifications.
- WADO-URI/WS/RS SCU, which retrieves imaging document/set studies/series/instances from remote AEs through WADO interface
- WADO-RS SCP, which provides studies/series/instances access to the remote AEs through WADO interface
- STOW-RS SCU, which stores instance to the remote AE through STOW-RS interface
- STOW-RS SCP, which provides STOW-RS storage service to remote AEs
- QIDO-RS SCU, which queries the remote AE with QIDO-RS interface
- QIDO-RS SCP, which provides QIDO-RS service to the remote AEs





4.1.2. Functional Definitions of AEs

4.1.2.1. Echo-SCP

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

4.1.2.2. Storage-SCP

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

4.1.2.3. Storage-SCU

STORAGE-SCU is activated through the user interface when a user selects studies from the local database and requests that they be sent to a remote AE (selected from a pre-configured DICOM AE list).

4.1.2.4. Find-SCU

FIND-SCU is activated through the user interface when a user clicks 'Refresh' button in 'Remote' view.

4.1.2.5. Move-SCU

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

4.1.2.6. Detached Interpretation Management Service Class SCU

Detached Interpretation Management Service Class SCU is activated through UI when a user requests to check report status of a study, Nil Read issues DIMSE N-GET requests to remote AE to request interpretation status for the requested study. Nil Read also accepts association requests from the SCP to receive unsolicited notifications of detached interpretation status change events.

4.1.2.7. Storage Commitment SCU

Storage commitment SCU is activated when a requested study is sent to a remote Storage SCP that has Storage commitment service enabled.

4.1.2.8. Storage Commitment SCP

Storage commitment SCP is activated when storage commitment request is transmitted to Nil together with a list of references to one or more SOP Instances. Success or failure of storage commitment is subsequently indicated by a notification from the SCP to the SCU.

4.1.2.9. Find-SCP

FIND- SCP waits in the background for connections, will accept associations with Presentation Contexts for the SOP Class of the Study Root Query/Retrieve Information Model – FIND Service

Class or the Patient Root Query/Retrieve Information Model – FIND Service Class, and will respond successfully to query requests.

4.1.2.10. Move-SCP

MOVE-SCP waits in the background for connections, will accept associations with Presentation Contexts for the SOP Class of the Study Root Query/Retrieve Information Model – MOVE Service Class or the Patient Root Query/Retrieve Information Model – MOVE Service Class, and will respond successfully to retrieve requests by initiating storage of instances to the remote Application Entity.

4.1.2.11. WADO-RS SCP

The reception of a WADO-RS request will activate the AE. An internal request is sent to the search capabilities of the OptosAdvance. This request is based upon the request parameters or the URL resource end point from the WADO request. The response is a list of all SOP instances stored on the OptosAdvance that match the request parameters. If there are no matching instances, the AE will indicate this in the WADO response. If the request was for retrieval of instances, these instances will be returned.

4.1.2.12. STOW-RS SCP

The reception of a STOW-RS POST request will activate the STOW-RS Service. The storage request is based upon the accept headers in the STOW-RS POST request. The response includes an HTTP/1.1 status line, including a status-code and its associated textual phrase, followed by an XML message indicating success, warning, or failure for each instance stored by the STOW-RS service

4.1.2.13. QIDO-RS SCP

The reception of a QIDO-RS GET request will activate the QIDO-RS Provider. An internal query request is sent to the search capabilities of the associated AE. The search result is based upon the URL of the QIDO-RS GET request. The response is a status code indicating the success, warning, or failure of the search along with any matching results stored in the Remote AE.

4.1.2.14. WADO-RS/WS/URI SCU

OptosAdvance can produce WDAO-RS/WS/URI requests to retrieve study/series/frame/meta in the Query/Retrieve interface.

4.1.2.15. STOW-RS SCU

OptosAdvance can produce and send STOW-RS requests to the remote AE to store an SOP instance. All request messages are HTTP/1.1 multipart messages. The SOP Instances into message parts are encoded with the organization of one message part per DICOM Instance.

4.1.2.16. QIDO-RS SCU

OptosAdvance can produce and send QIDO-RS requests to the remote AE for queries studies/series/instances.

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 initiated through the user interface, and are typically synchronous and blocking; STORAGE-SCU and MOVE-SCU activities are asynchronous and non-blocking.

4.2.AE Specifications

4.2.1. ECHO-SCP

4.2.1.1. SOP Classes

ECHO-SCP provides Standard Conformance to the following SOP classes:

Table 4.2-1
SOP CLASSES SUPPORTED BY ECHO SCP

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

4.2.1.2. Association Policies

4.2.1.2.1. General

ECHO-SCP accepts but never initiates associations.

Table 4.2-2
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR ECHO-SCP

Maximum PDU size received	114KB(approximate)
---------------------------	--------------------

4.2.1.2.1.1. Number of Associations

Table 4.2-3
NUMBER OF ASSOCIATIONS AS A SCP FOR ECHO-SCP

Maximum number of simultaneous associations	Unlimited
---	-----------

4.2.1.2.1.2. Asynchronous nature

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

4.2.1.2.1.3. Implementation Identifying Information

Table 4.2-4
DICOM IMPLEMENTATION CLASS AND VERSION FOR ECHO SCP

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.1.3. Association Initiation Policy

ECHO-SCP does not initiate associations.

4.2.1.4. Association Acceptance Policy

ECHO-SCP by default accepts any called AE title provided by SCU, however the called AE title validation can be enabled in OptosAdvance's configuration file.

When ECHO-SCP accepts an association, it will respond to echo request

4.2.1.4.1. Activity – Receive Echo Request

4.2.1.4.1.1. Description and Sequencing of Activities

As requests are received, they are responded to immediately.

4.2.1.4.1.2. Accepted Presentation Context

Table 4.2-5

ACCEPTABLE PRESENTATION CONTEXTS FOR ECHO-SCP AND RECEIVE ECHO REQUEST

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

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

4.2.1.4.1.3.2. Transfer Syntax Selection Policies

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

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

4.2.2. STORAGE-SCP

4.2.2.1. SOP Classes

STORAGE-SCP provides Standard Conformance to the following SOP classes:

Table 4.2-6

SOP CLASSES SUPPORTED BY STORAGE-SCP

SOP Class Name	SOP Class UID
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2

Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Wide Field Ophthalmic Photography Stereographic Projection Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.5

4.2.2.2. Association Policies

4.2.2.2.1. General

STORAGE-SCP accepts but never initiates associations.

Table 4.2-7

MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE-SCP

Maximum PDU size received	114KB(approximate)
---------------------------	--------------------

4.2.2.2.2. Number of Associations

Table 4.2-8

NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE-SCP

Maximum number of simultaneous associations	Unlimited
---	-----------

4.2.2.2.3. Asynchronous nature

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

4.2.2.2.4. Implementation Identifying Information

Table 4.2-9

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE SCP

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.2.3. Association Initiation Policy

STORAGE-SCP does not initiate associations.

4.2.2.4. Association Acceptance Policy

When STORAGE-SCP accepts an association, it will respond to storage requests.

The association will be rejected if the Called AE Title does not match the configured AE Title of the Nil Read application.

STORAGE-SCP accepts association requests from any Calling AE Title.

4.2.2.4.1. Activity – Receive Storage Request

4.2.2.4.1.1. Description and Sequencing of Activities

As instances are received, they are copied to the local file system and a record is created in the internal database. If the received instance is a duplicate of a previously received instance, the instance will be discarded.

4.2.2.4.1.2. Accepted Presentation Context

Table 4.2-10

ACCEPTABLE PRESENTATION CONTEXTS FOR STORAGE-SCP AND RECEIVED STORAGE REQUEST

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
See Table 4.2-6	See Table 4.2-6	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCP	None
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	SCP	None

	JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57	SCP	None
	JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	SCP	None
	JPEG 2000 Lossy	1.2.840.10008.1.2.4.90	SCP	None
	JPEG 2000 Lossless	1.2.840.10008.1.2.4.91	SCP	None
	RLE Lossless	1.2.840.10008.1.2.5	SCP	None

4.2.2.4.1.2.1. Extended Negotiation

No extended negotiation is performed, though Nil STORAGE-SCP:

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

4.2.2.4.1.3. SOP Specific Conformance

4.2.2.4.1.3.1. SOP Specific Conformance to Storage SOP Class

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

4.2.2.4.1.3.2. Presentation Context Acceptance Criterion

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

4.2.2.4.1.3.3. Transfer Syntax Selection Policies

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

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

4.2.2.4.1.3.4. Response Status

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

**Table 4.2-11
RESPONSE STATUS FOR STORAGE-SCP AND RECEIVE STORAGE REQUEST**

Service Status	Further Meaning	Status Codes	Reason
----------------	-----------------	--------------	--------

Failure	Processing Failure	0110	Sent when an error occurs trying to save the stored SOP instance to disk
Success		0000	Sent as each SOP is stored

4.2.3. STORAGE-SCU

4.2.3.1. SOP Classes

STORAGE-SCU provides Standard Conformance to the following SOP classes:

Table 4.2-12
SOP CLASSES SUPPORTED BY STORAGE-SCU

SOP Class Name	SOP Class UID
Color Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.2
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Grayscale Softcopy Presentation State Storage SOP Class	1.2.840.10008.5.1.4.1.1.11.1
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.15.2
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.15.1
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.15.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.14.1
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.14
Wide Field Ophthalmic Photography Stereographic Projection Image Storage	1.2.840.10008.5.1.4.1.1.77.15.5

4.2.3.2. Association Policies

4.2.3.2.1. General

STORAGE-SCU initiates but never accepts associations.

Table 4.2-13
 MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE-SCU

Maximum PDU size received	114KB(approximate)
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4.2.3.2.2. Number of Associations

Table 4.2-14
 NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE-SCU

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

4.2.3.2.3. Asynchronous nature

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

4.2.3.2.4. Implementation Identifying Information

Table 4.2-15
 DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE SCU

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.3.3. Association Initiation Policy

When initiated by the user, STORAGE-SCU attempts to initiate a new association for the study, or group of studies, selected (e.g. one association per user-initiated send operation).

4.2.3.3.1. Activity –Send Storage Request

4.2.3.3.1.1. Description and Sequencing of Activities

For each instance selected from the user interface to be transferred, a single attempt will be made to transmit it to the selected remote AE, if the send fails, no retry will be performed on the same association, and an attempt will be made to send the next instance.

However for whatever reason, if the association is aborted, Nil Read may retry the send operation on a new association in a later time, the retry interval and number of the attempts are configurable, by default Nil Read will retry 3 times in 10, 20 and 30 seconds interval followed by the previous failed attempt.

4.2.3.3.1.2. Proposed Presentation Context

Table 4.2-16
 PROPOSED PRESENTATION CONTEXTS FOR STORAGE-SCU AND SEND STORAGE REQUEST

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
See Table 4.2-12	See Table 4.2-12	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50	SCU	None
		JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51	SCU	None
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57	SCP	None
		JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	SCU	None
		JPEG 2000 Lossy	1.2.840.10008.1.2.4.90	SCU	None
		JPEG 2000 Lossless	1.2.840.10008.1.2.4.91	SCU	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None

STORAGE-SCU examines all the Abstract Syntax/Transfer Syntax pairs in the instances to be stored, and applies the following algorithm when determining the Presentation Contexts to propose:

- For each Abstract Syntax/Transfer Syntax pair where the Transfer Syntax is uncompressed, a Presentation Context will be defined for the Abstract Syntax with both Explicit and Implicit Little Endian Transfer Syntaxes only.
- For those Abstract Syntax/Transfer Syntax pairs where the Transfer Syntax is encapsulated (e.g. compressed), a Presentation Context is defined for the Abstract Syntax with only the encapsulated Transfer Syntax.

For those Abstract Syntax/Transfer Syntax pairs where the Transfer Syntax is encapsulated and STORAGE-SCU is able to convert to an uncompressed Transfer Syntax (e.g. Explicit or Implicit Little Endian), an additional Presentation Context is defined for each such Abstract Syntax, with only Explicit and Implicit Little Endian Transfer Syntaxes.

The implications of this algorithm are:

- STORAGE-SCU will never compress an instance in order to store it.

- Compressed instances will be stored as-is whenever possible, or failing that, in either Explicit or Implicit Little Endian format. When STORAGE-SCU is incapable of decompressing an instance, it simply will not be stored and STORAGE-SCU will continue sending the remaining instances.

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 to Storage SOP Class

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

4.2.3.3.1.3.2. Presentation Context Acceptance Criterion

STORAGE-SCU does not accept associations.

4.2.3.3.1.3.3. Transfer Syntax Selection Policies

For encapsulated Transfer Syntaxes, STORAGE-SCU prefers to send each instance using its current Transfer Syntax, and will find the first Presentation Context where the Transfer Syntax was accepted. In the case where the Transfer Syntax was not accepted by the remote STORAGE-SCP, STORAGE-SCU will check for the acceptance of Explicit VR Little Endian and Implicit VR Little Endian, in that order. If STORAGE-SCU cannot change the Transfer Syntax, the sub-operation will fail and it will not store the instance.

In the case of uncompressed Transfer Syntaxes, STORAGE-SCU has no real preference. It will store the instances in either Explicit VR Little Endian or Implicit VR Little Endian, depending on what was accepted by the SCP.

4.2.3.3.1.3.4. Response Status

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

**Table 4.2-17
RESPONSE STATUS FOR STORAGE-SCP AND RECEIVE STORAGE REQUEST**

Service Status	Further Meaning	Status Codes	Reason
Failure	N/A	Any	Message shown in Nil Send Task Queue UI, continues storing remaining instances.
Success	N/A	Any	Message shown in Nil Send Task Queue UI, continues storing remaining instances.

4.2.4. FIND-SCU

4.2.4.1. SOP Classes

FIND-SCU provides Standard Conformance to the following SOP classes:

Table 4.2-18
SOP CLASSES SUPPORTED BY FIND-SCU

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1

4.2.4.2. Association Policies

4.2.4.2.1. General

FIND-SCU initiates but never accepts associations.

Table 4.2-19
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR FIND-SCU

Maximum PDU size received	114KB(approximate)
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4.2.4.2.1.1. Number of Associations

Table 4.2-20
NUMBER OF ASSOCIATIONS AS A SCP FOR FIND-SCU

Maximum number of simultaneous associations	1
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4.2.4.2.1.2. Asynchronous nature

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

4.2.4.2.1.3. Implementation Identifying Information

Table 4.2-21
DICOM IMPLEMENTATION CLASS AND VERSION FOR FIND-SCU

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.4.3. Association Initiation Policy

FIND-SCU attempts to initiate a new association when the user performs the query action from the user interface. Furthermore, FIND-SCU attempts to initiate new associations for the purpose of locating prior studies when the user opens a study for viewing.

4.2.4.3.1. Activity –Query Remote AE

4.2.4.3.1.1. 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.

4.2.4.3.1.2. Proposed Presentation Context

Table 4.2-22
PROPOSED PRESENTATION CONTEXTS FOR FIND-SCU AND SEND QUERY REQUEST

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
See Table 4.2-6	See Table 4.2-6	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.4.3.1.3. Extended Negotiation

No extended negotiation is performed.

4.2.4.3.1.4. SOP Specific Conformance

4.2.4.3.1.4.1. SOP Specific Conformance to Storage SOP Classes

FIND-SCU provides standard conformance to the Supported C-FIND Service Class.

Only a single information model, Study Root, is supported and is only used at the STUDY and SERIES levels. IMAGE level queries are never performed.

CANCEL requests may be issued upon user requests.

Unexpected attributes returned in a C-FIND response (those not requested) are discarded. Requested return attributes not returned by the SCP are ignored. In general, non-matching responses returned by the SCP due to unsupported (hopefully optional) matching keys are not filtered locally by the FIND-SCU and thus will still be presented in the UI, with the exception of Modalities in Study, which is filtered by the SCU.

Specific Character Set is included in the C-FIND SCU request. If present in the response, Specific Character Set will be used to identify character sets other than the default character set for display of strings in the UI.

Retrieve AE Title is not included in the C-FIND request at any level. If present in the response, it is ignored.

**Table 4.2-23
STUDY ROOT REQUEST IDENTIFIER FOR FIND-SCU**

NAME	TAG	TYPE OF MATCHING
Patient/Study Level		
Study Instance UID	(0020,000D)	UNIQUE
Patient's ID	(0010,0020)	S,*,U
Patient's Name	(0010,0010)	S,*,U
Patient's Birth Date	(0010,0030)	U

Referring Physician's Name	(0008,0090)	S,*,U
Study Description	(0008,1030)	S,*,U
Modalities In Study	(0008,0061)	S,U
Study Date	(0008,0020)	S,U,R
Study Time	(0008,0030)	U
Accession Number	(0008,0050)	S,*,U
Number Of Study Related Instances	(0020,1208)	U
Series Level		
Study Instance UID	(0020,000D)	UNIQUE
Series Instance UID	(0020, 000E)	UNIQUE
Modality	(0008, 0060)	U
Image Level		
N/A		
Common to All Query Levels		
Specific Character Set	(0008,0005)	N/A
Retrieve AE Title	(0008,0054)	N/A

Types of Matching:

An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, a "*" indicates wildcard matching, a "U" indicates Universal Matching, an "L" indicates that a UID list is sent, and "UNIQUE" indicates that this is the Unique Key for that query level.

4.2.4.3.1.4.2. Presentation Context Acceptance Criterion

FIND-SCU does not accept associations.

4.2.4.3.1.4.3. Transfer Syntax Selection Policies

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

4.2.4.3.1.4.4. Response Status

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

Table 4.2-24
RESPONSE STATUS FOR FIND-SCU AND QUERY REMOTE AE REQUEST

Service Status	Further Meaning	Status Codes	Behavior
----------------	-----------------	--------------	----------

Failure	N/A	Any	Association closed, message shown to user
Cancel	Matching terminated due to Cancel request	FE00	Association closed, message shown to user
Success	Matching is complete - No final Identifier is supplied	0000	Association closed

4.2.5. MOVE-SCU

4.2.5.1. 4.2.8.1 SOP Classes

MOVE-SCU provides Standard Conformance to the following SOP classes:

Table 4.2-25
SOP CLASSES SUPPORTED BY MOVE-SCU

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

4.2.5.2. Association Policies

4.2.5.2.1. General

MOVE-SCU initiates but never accepts associations.

Table 4.2-26
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR MOVE-SCU

Maximum PDU size received	114kB (approx.)
---------------------------	-----------------

4.2.5.2.2. Number of Associations

Table 4.2-27
NUMBER OF ASSOCIATIONS AS A SCP FOR MOVE-SCU

Maximum number of simultaneous associations	Unlimited
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4.2.5.2.3. Asynchronous Nature

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

4.2.5.2.4. Implementation Identifying Information

Table 4.2-28
DICOM IMPLEMENTATION CLASS AND VERSION FOR MOVE-SCU

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	DICOM 2.0 SP1

4.2.5.3. Association Initiation Policy

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

4.2.5.3.1. Activity – Retrieve from Remote AE

4.2.5.3.1.1. Description and Sequencing of Activities

For the study selected from the user interface to be retrieved, a single attempt will be made to retrieve it from the selected remote AE. If the retrieve fails, for whatever reason, no retry will be performed.

4.2.5.3.1.2. Proposed Presentation Contexts

Table 4.2-29

PROPOSED PRESENTATION CONTEXTS FOR MOVE-SCU AND SEND TO REMOTE AE REQUEST

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
See Table 4.2-25	See Table 4.2-25	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		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 retrievals are not supported.

4.2.5.3.1.3. SOP Specific Conformance

4.2.5.3.1.3.1. SOP Specific Conformance to C-MOVE SOP Classes

MOVE-SCU provides standard conformance to the supported C-MOVE SOP Classes, with one exception: the retrieval is performed from the AE that was queried by FIND-SCU, rather than the AE specified in the Retrieve AE Title attribute of the C-FIND response.

Retrievals will be performed at the STUDY level only.

CANCEL requests may be issued upon user requests.

The instances are retrieved to the OptosAdvance local database by specifying the Move Destination as the AE Title of the STORE-SCP AE of the Nil. This implies that the remote C-MOVE SCP must be preconfigured to determine the presentation address corresponding to the STORE-SCP AE. The Nil STORE-SCP AE will accept storage from all hosts, as long as the called AE Title is matched.

Table 4.2-30

STUDY ROOT REQUEST IDENTIFIER FOR MOVE-SCU

Name	Tag	Unique, Matching or Return Key
Study level		
Study Instance UID	(0020,000D)	UNIQUE

4.2.5.3.1.3.2. Presentation Context Acceptance Criterion

MOVE-SCU does not accept associations.

4.2.5.3.1.3.2.1. Transfer Syntax Selection Policies

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

4.2.5.3.1.3.3. Response Status

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

**Table 4.2-31
RESPONSE STATUS FOR MOVE-SCU AND SEND TO REMOTE AE REQUEST**

Service Status	Further Meaning	Status Codes	Behavior
Failure	N/A	Any	Association closed, message shown in Receive Queue UI
Cancel	Sub-operations terminated due to Cancel Indication	FE00	Association closed, message shown in Receive Queue UI
Warning	N/A	Any	message shown in Receive Queue UI
Success	Sub-operations Complete - No Failures	0000	Association closed

Sub-operation Dependent Behavior

Since the C-MOVE operation is dependent on completion of C-STORE sub-operations that are occurring on another association, the question of failure of operations on the other association(s) must be considered.

With the exception of showing error messages in the Receive Queue UI, MOVE-SCU completely ignores whatever activities are taking place in relation to the STORAGE-SCP AE that is receiving the retrieved instances. Once the C-MOVE has been initiated it runs to completion (or failure) as described in the C-MOVE response command message(s). There is no attempt by MOVE-SCU to confirm that instances have actually been successfully received or locally stored.

Whether or not completely or partially successful retrievals are made available in the local database to the user is purely dependent on the success or failure of the C-STORE sub-operations, not on any explicit action by MOVE-SCU.

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

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

4.2.5.4. Association Acceptance Policy

MOVE-SCU does not accept associations.

4.2.6. Detached Interpretation Management Service Class SCU

4.2.6.1. SOP Classes

Detached Interpretation Management SCU provides standard conformance to the following SOP classes as a SCU role:

Table 4.2-32
SOP CLASSES SUPPORTED BY
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU

SOP Class Name	SOP Class UID
Detached Interpretation Management SOP Class (Retired)	1.2.840.10008.3.1.2.6.1

Note, only N-EVENT-REPORT and N-GET of the Detached Interpretation Management SOP Class are supported.

4.2.6.2. Association Policies

4.2.6.2.1. General

Nil Read sends DIMSE N-GET requests to remote AE for querying detached interpretation (report) status and it accepts association requests for receiving N-EVENT-REPORT notification from a remote AE.

Table 4.2-33
MAXIMUM PDU SIZE SEND AS A
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU

Maximum PDU size received	114KB(approximate)
---------------------------	--------------------

4.2.6.2.2. Number of Associations

Table 4.2-34
NUMBER OF ASSOCIATIONS AS A
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU

Maximum number of simultaneous associations	Unlimited
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4.2.6.2.3. Asynchronous nature

Nil Read will not perform asynchronous operations

4.2.6.2.4. Implementation Identifying Information

Table 4.2-35

**DICOM IMPLEMENTATION CLASS AND VERSION FOR
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU**

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.6.3. Association Initiation Policy

Nil Read initiates associations upon user’s requests to query detached interpretation status on a specified remote AE.

4.2.6.4. Association Acceptance Policy

Nil Read accepts association requests from remote AEs for receiving the interpretation status notification.

4.2.6.4.1. Activity – sends DIMSE N-GET request

4.2.6.4.1.1. Description and Sequencing of Activities

Upon user’s requests, Nil read will send DIMSE N-GET request to remote AE for querying detached interpretation status of a specific study.

4.2.6.4.1.2. Proposed Presentation Context

Table 4.2-36

**PROPOSED PRESENTATION CONTEXTS FOR
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU REQUEST**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
Detached Interpretation Management SOP Class	1.2.840.10008.3.1.2.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.6.4.1.2.1. Extended Negotiation

No extended negotiation is performed.

4.2.6.4.1.3. SOP Specific Conformance

4.2.6.4.1.3.1. SOP Specific Conformance to Detached Interpretation Management Service Class SCU

Nil Read specifies the following Interpretation Management SOP Class Attributes in its N-GET request:

**Table 4.2-23
DIMSE N-GET REQUEST FOR
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU**

NAME	TAG
Specific Character Set	(0008,0005)
Referenced Results Sequence	(0008,1100)
Interpretation Text	(4008,010B)
Interpretation ID	(4008,0200)
Interpretation Type ID	(4008,0210)
Interpretation Status ID	(4008,0212)
Interpretation Diagnosis Description	(4008,0115)

Note, the requested SOP instance UID that specifies the SOP Instance (study) for which Attribute Values are to be retrieved is specified in standard N-GET command parameters.

By default Nil Read loads the report from attribute 'Interpretation Text, however it can be configured to read from 'Interpretation Diagnosis Description' attribute instead.

4.2.6.4.2. Activity - Receive N-EVENT-REPORT notification

4.2.6.4.2.1. Description and Sequencing of Activities

As the notifications are received, they are responded to immediately.

4.2.6.4.2.2. Accepted Presentation Context

**Table 4.2-36
ACCEPTABLE PRESENTATION CONTEXTS FOR
DETACHED INTERPRETATION MANAGEMENT SERVICE CLASS SCU REQUEST**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
Detached Interpretation Management SOP Class	1.2.840.10008.3.1.2.6.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.6.4.2.2.1. Extended Negotiation

No extended negotiation is performed.

4.2.6.4.2.3. SOP Specific Conformance.

4.2.6.4.2.3.1. Transfer Syntax Selection Policies

Detached Interpretation Management SCU will select the first Transfer Syntax that is accepted by the SCP, per Presentation Context.

Nil Read supports the following event types:

- Interpretation Recorded – Interpretation has been dictated and is ready for transcription
- Interpretation Transcribed – Interpretation has been transcribed and is ready for approval
- Interpretation Approved – Interpretation is complete and approved report status in Nil Read database will be marked as available and user will be able to review the report from Nil Read UI.

4.2.7. STORAGE COMMITMENT SCU

4.2.7.1. SOP Classes

STORAGE COMMITMENT SCU provides Standard Conformance to the following SOP classes:

Table 4.2-37
SOP CLASSES SUPPORTED BY STORAGE COMMITMENT SCU

SOP Class Name	SOP Class UID
Storage Commitment Push Model	1.2.840.10008.1.20.1

4.2.7.2. Association Policies

4.2.7.2.1. General

STORAGE COMMITMENT SCU initiates associations for sending storage commitment N-ACTION requests and accepts associations for receiving storage commitment N-EVENT-REPORT.

Table 4.2-38
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE COMMITMENT SCU

Maximum PDU size receives	114kB (approx.)
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4.2.7.2.2. Number of Associations

Table 4.2-39
NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE COMMITMENT SCU

Maximum number of simultaneous associations	Unlimited
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4.2.7.2.3. Asynchronous Nature

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

4.2.7.2.4. Implementation Identifying Information

Table 4.2-40

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE COMMITMENT SCU

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	DICOM 2.0 SP1

4.2.7.3. Association Initiation Policy

STORAGE COMMITMENT SCU attempts to initiate a new association after a study is sent to a remote storage SCP successfully and the remote storage SCP is configured with the storage commitment support enabled.

4.2.7.3.1.1. Activity – Send Storage Commitment N-ACTION-RQ Request

Description and Sequencing of Activities

If configured, for each study that has been successfully sent to a remote storage SCP, Nil Read will initiate a new association and send a commitment N-ACTION request for the study to the configured storage commitment SCP, the request contains all SOP instance UID of the images of the study.

4.2.7.3.1.1.1. Proposed Presentation Contexts

Table 4.2-41

PROPOSED PRESENTATION CONTEXTS FOR STORAGE COMMITMENT SCU TO REMOTE AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.7.3.1.1.1.1. Extended Negotiation

No extended negotiation is performed.

4.2.7.3.1.2. SOP Specific Conformance

4.2.7.3.1.2.1. SOP Specific Conformance to STORAGE COMMITMENT PUSH MODEL SOP Classes

The STORAGE COMMITMENT SCU will initiate an association and send the N-ACTION-RQ message to the configured storage commitment SCP. Nil Read supports the standard DICOM elements for Storage Commitment Push Model SOP Class as an SCU as listed in the table below:

**Table 4.2-42
STORAGE COMMITMENT SCU N-ACTION REQUEST DICOM ATTRIBUTES**

Name	Tag	Remarks
Transaction UID	(0008,1195)	
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	

4.2.7.4. Association Acceptance Policy

If configured, STORAGE COMMITMENT SCU may accept associations initiated from STORAGE COMMITMENT SCP for receiving storage commitment N-EVENT-REPORT notification in response to the storage commitment requests it sent before.

4.2.7.4.1. Activity – Receive Storage Commitment N-EVENT-REPORT Notification

Description and Sequencing of Activities

If configured, Nil Read will accept associations initiated from storage commitment SCP for receiving Storage Commitment N-EVENT-REPORT notifications, if a notification with failure status is received, the requested study will be put in an internal retry queue and a new storage attempt will be made for the study up to N times (N is configurable), if after N times the study is still not stored successfully, the send operation will be marked as ‘Failed’ in Nil database.

4.2.7.4.1.1. Accepted Presentation Contexts

Table 4.2-43

ACCEPTED PRESENTATION CONTEXTS FOR STORAGE COMMITMENT SCU TO REMOTE AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.7.4.1.1.1. Extended Negotiation

No extended negotiation is performed.

4.2.7.4.1.2. SOP Specific Conformance

4.2.7.4.1.2.1. SOP Specific Conformance to STORAGE COMMITMENT PUSH MODEL SOP Classes

Nil Read supports the standard DICOM elements for Storage Commitment Push Model SOP Class as an SCU as listed in the table below:

Table 4.2-44

STORAGE COMMITMENT SCU N-EVENT-REPORT NOTIFICATION DICOM ATTRIBUTES - Success

Name	Tag	Remarks
Transaction UID	(0008,1195)	
Retrieve AE Title	(0008,0054)	
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	

Table 4.2-45

STORAGE COMMITMENT SCU N-EVENT-REPORT NOTIFICATION DICOM ATTRIBUTES - Failure

Name	Tag	Remarks
Transaction UID	(0008,1195)	
Retrieve AE Title	(0008,0054)	
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
Failed SOP Sequence	(0008,1198)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	

4.2.7.4.1.2.2. Presentation Context Acceptance Criterion

STORAGE COMMITMENT SCU always accepts associations for receiving storage commitment N-EVENT-REPORT, but only the notifications with known transaction UIDs (0008, 1195) will be processed.

4.2.7.4.1.2.3. Transfer Syntax Selection Policies

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

4.2.7.4.1.2.4. Response Status

No Service Class specific status values are defined for the STORAGE COMMITMENT N-ACTION Service. See DICOM Standard PS 3.7 for general response status codes.

4.2.8. STORAGE COMMITMENT SCP

4.2.8.1. SOP Classes

STORAGE COMMITMENT SCP provides Standard Conformance to the following SOP classes:

Table 4.2-46

SOP CLASSES SUPPORTED BY STORAGE COMMITMENT SCP

SOP Class Name	SOP Class UID
Storage Commitment Push Model	1.2.840.10008.1.20.1

4.2.8.2. Association Policies

4.2.8.2.1. General

STORAGE COMMITMENT SCP accepts associations for receiving storage commitment N-ACTION requests and initiates associations for sending storage commitment N-EVENT-REPORT notifications.

Table 4.2-47

MAXIMUM PDU SIZE RECEIVED AS A SCP FOR STORAGE COMMITMENT SCP

Maximum PDU size receives	114kB (approx.)
---------------------------	-----------------

4.2.8.2.2. Number of Associations

Table 4.2-48

NUMBER OF ASSOCIATIONS AS A SCP FOR STORAGE COMMITMENT SCP

Maximum number of simultaneous associations	Unlimited
---	-----------

4.2.8.2.3. Asynchronous Nature

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

4.2.8.2.4. Implementation Identifying Information

Table 4.2-49

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE COMMITMENT SCP

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	DICOM 2.0 SP1

4.2.8.3. Association Initiation Policy

If STORAGE COMMITMENT SCU is configured to receive N-EVENT-REPORT notification on a separate association, STORAGE COMMITMENT SCP will attempt to initiate a new association to send storage commitment N-EVENT-REPORT notification to the SCU.

4.2.8.3.1. Activity – Send Storage Commitment N-EVENT-REPORT Notification

1.1.3.1.1.1 Description and Sequencing of Activities

When STORAGE COMMITMENT SCP receives a storage commitment request from SCU, it will check storage status for the requested DICOM instances in database, and send the status back to SCU in a storage commitment N-EVENT-REPORT notification.

4.2.8.3.1.1. Proposed Presentation Contexts

Table 4.2-50

PROPOSED PRESENTATION CONTEXTS FOR STORAGE COMMITMENT SCP TO REMOTE AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

4.2.8.3.1.1.1. Extended Negotiation

No extended negotiation is performed.

4.2.8.3.1.2. SOP Specific Conformance

4.2.8.3.1.2.1. SOP Specific Conformance to STORAGE COMMITMENT PUSH MODEL SOP Classes

The STORAGE COMMITMENT SCP will initiate an association and send the N-EVENT-REPORT notification to the requesting SCU. OptosAdvance supports the standard DICOM elements for Storage Commitment Push Model SOP Class as an SCP as listed in the table below:

Table 4.2-51

STORAGE COMMITMENT SCP N-EVENT-REPORT NOTIFICATION DICOM ATTRIBUTES - Success

Name	Tag	Remarks
Transaction UID	(0008,1195)	
Retrieve AE Title	(0008,0054)	
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	

>Referenced SOP Instance UID	(0008,1155)	
------------------------------	-------------	--

Table 4.2-52

STORAGE COMMITMENT SCP N-EVENT-REPORT NOTIFICATION DICOM ATTRIBUTES - Failure

Name	Tag	Remarks
Transaction UID	(0008,1195)	
Retrieve AE Title	(0008,0054)	
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	
Failed SOP Sequence	(0008,1198)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	

4.2.8.4. Association Acceptance Policy

STORAGE COMMITMENT SCP accepts associations initiated from STORAGE COMMITMENT SCU for receiving storage commitment N-ACTION-RQ message.

4.2.8.4.1. Activity – Response to Storage Commitment N-ACTION-RQ request

4.2.8.4.1.1. Description and Sequencing of Activities

Upon receiving of Storage Commitment N-ACTION-RQ request, STOREAGE COMMITMENT SCP will check storage status of the requested DICOM instances in database and send a storage commitment N-EVENT-REPORT response in the same or a new association depends on server configuration.

4.2.8.4.1.2. Accepted Presentation Contexts

Table 4.2-53

ACCEPTED PRESENTATION CONTEXTS FOR STORAGE COMMIEMENT SCP FROM REMOTE AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		None
Storage Commitment Push Model	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.8.4.1.2.1. Extended Negotiation

No extended negotiation is performed.

4.2.8.4.1.3. SOP Specific Conformance

4.2.8.4.1.3.1. SOP Specific Conformance to STORAGE COMMITMENT PUSH MODEL SOP Classes

Nil Read supports the standard DICOM elements for Storage Commitment Push Model SOP Class as an SCU as listed in the table below:

**Table 4.2-54
STORAGE COMMITMENT SCU N-ACTION REQUEST DICOM ATTRIBUTES**

Name	Tag	Remarks
Transaction UID	(0008,1195)	
Referenced SOP Sequence	(0008,1199)	
>Referenced SOP Class UID	(0008,1150)	
>Referenced SOP Instance UID	(0008,1155)	

4.2.8.4.1.3.2. Presentation Context Acceptance Criterion

STORAGE COMMITMENT SCP always accepts associations that with correct called AE title.

4.2.8.4.1.3.3. Transfer Syntax Selection Policies

STORAGE COMMITMENT SCP prefers Explicit VR Little Endian Transfer Syntax, which is always first in the proposed Presentation Context.

4.2.8.4.1.3.4. Response Status

No Service Class specific status values are defined for the STORAGE COMMITMENT N-ACTION Service. See DICOM Standard PS 3.7 for general response status codes.

4.2.9. FIND-SCP

4.2.9.1. SOP Classes

FIND-SCP provides Standard Conformance to the following SOP classes:

**Table 4.2-55
SOP CLASSES SUPPORTED BY FIND-SCP**

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model-FIND	1.2.840.10008.5.1.4.1.1.12.1
Patient Root Query/Retrieve Information Model-FIND	1.2.840.10008.5.1.4.1.1.12.2

4.2.9.2. Association Policies

4.2.9.2.1. General

FIND-SCP accepts but never initiates associations.

**Table 4.2-56
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR FIND-SCP**

Maximum PDU size received	114KB(approximate)
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4.2.9.2.2. Number of Associations

Table 4.2-57

NUMBER OF ASSOCIATIONS AS A SCP FOR FIND-SCP

Maximum number of simultaneous associations	Unlimited
---	-----------

4.2.9.2.3. Asynchronous nature

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

4.2.9.2.4. Implementation Identifying Information

Table 4.2-58

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE SCP

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.9.3. Association Initiation Policy

FIND-SCP does not initiate associations.

4.2.9.4. Association Acceptance Policy

When FIND-SCP accepts an association, it will respond to query requests. The association will be rejected if:

- The Called AE Title does not match the AE Title shared by all the SCPs of the application.
- The Calling AE Title is not in the application’s pre-configured list.

4.2.9.4.1. Activity – Receive Query Request

4.2.9.4.1.1. Description and Sequencing of Activities

When a query is received, the local database is queried for the result set.

4.2.9.4.1.2. Accepted Presentation Context

Table 4.2-59

ACCEPTABLE PRESENTATION CONTEXTS FOR FIND-SCP AND RECEIVED QUERY REQUEST

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See	See	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

Table 4.2-55	Table 4.2-55	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
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4.2.9.4.1.2.1. Extended Negotiation

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

4.2.9.4.1.3. SOP Specific Conformance

4.2.9.4.1.3.1. SOP Specific Conformance to C-FIND SOP Class

FIND-SCP provides standard conformance to the supported C-FIND SOP Classes with one exception: all matching is case-insensitive, which is not in strict compliance with DICOM PS 3.4. This was a conscious decision, as case-sensitive matching is not intuitive and most users would be completely unaware of the fact that it even matters, causing many expected query matches to not be returned.

Only those attributes that are requested are returned in a C-FIND response. Some optional requested attributes will be returned as per Table 4.2-60 and Table 4.2-61

**Table 4.2-60
STUDY ROOT RESPONSE IDENTIFIER FOR FIND-SCP**

NAME	TAG	TYPE OF MATCHING
Patient/Study Level		
Study Instance UID	(0020,000D)	UNIQUE,L
Patient's Name	(0010,0010)	S,*,U
Patient's ID	(0010,0020)	S,*,U
Patient's Birth Date	(0010,0030)	S,U,R
Patient's Sex	(0010,0040)	S,U
Study ID	(0020,0010)	S,*,U
Referring Physician's Name	(0008,0090)	S,*,U
Study Description	(0008,1030)	S,*,U
Modalities In Study	(0008,0061)	S,U
Study Date	(0008,0020)	S,U,R
Study Time	(0008,0030)	S,U,R
Accession Number	(0008,0050)	S,*,U
Number Of Study Related Instances	(0020,1208)	U
Series Level		

Series Instance UID	(0020, 000E)	UNIQUE,L
Modality	(0008, 0060)	U
Number Of Series Related Instances	(0020,1209)	U
Image Level		
Instance Number	(0020,0013)	S,*,U
SOP Instance UID	(0008,0018)	S,U,L
SOP Class UID	(0008,0016)	S,U,L
Common to All Query Levels		
Specific Character Set	(0008,0005)	N/A
Retrieve AE Title	(0008,0054)	U

Table 4.2-61
PATIENT ROOT RESPONSE IDENTIFIER FOR FIND-SCP

NAME	TAG	TYPE OF MATCHING
Patient Level		
Patient's Name	(0010,0010)	S,*,U
Patient's ID	(0010,0020)	UNIQUE
Patient's Birth Date	(0010,0030)	S,U,R
Patient's Sex	(0010,0040)	S,U
Study Level		
Study Instance UID	(0020,000D)	UNIQUE,L
Study ID	(0020,0010)	S,*,U
Referring Physician's Name	(0008,0090)	S,*,U
Study Description	(0008,1030)	S,*,U
Modalities In Study	(0008,0061)	S,U
Study Date	(0008,0020)	S,U,R
Study Time	(0008,0030)	S,U,R
Accession Number	(0008,0050)	S,*,U
Number Of Study Related Instances	(0020,1208)	U
Series Level		

Series Instance UID	(0020, 000E)	UNIQUE,L
Modality	(0008, 0060)	U
Number Of Series Related Instances	(0020,1209)	U
Image Level		
Instance Number	(0020,0013)	S,*,U
SOP Instance UID	(0008,0018)	S,U,L
SOP Class UID	(0008,0016)	S,U,L
Common to All Query Levels		
Specific Character Set	(0008,0005)	N/A
Retrieve AE Title	(0008,0054)	NONE

Types of Matching:

An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, a "*" indicates wildcard matching, a „U" indicates Universal Matching, and an „L" indicates that a UID list is sent. "NONE" indicates that no matching is supported, but that values for this Element are returned when requested (i.e. universal matching), and "UNIQUE" indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

4.2.9.4.1.3.2. Presentation Context Acceptance Criterion

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

4.2.9.4.1.3.3. Transfer Syntax Selection Policies

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

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

4.2.9.4.1.3.4. Response Status

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

Table 4.2-62
RESPONSE STATUS FOR FIND-SCP AND RECEIVE QUERY REQUEST

Service Status	Further Meaning	Status Codes	Reason
----------------	-----------------	--------------	--------

Failure	Identifier does not match SOP Class	A900	Sent when the Query/Retrieve Level in the C-FIND request is not present or valid
	Unable to process	Cxxx	Sent if internal query is unsuccessful
Pending	Matches are continuing	FF00	
Success	All sub-operations complete	0000	

4.2.10. MOVE-SCP

4.2.10.1. SOP Classes

MOVE-SCP provides Standard Conformance to the following SOP classes:

Table 4.2-63
SOP CLASSES SUPPORTED BY MOVE-SCP

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model-MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient Root Query/Retrieve Information Model-MOVE	1.2.840.10008.5.1.4.1.2.1.2

4.2.10.2. Association Policies

4.2.10.2.1. General

MOVE-SCP accepts but never initiates associations.

Table 4.2-64
MAXIMUM PDU SIZE RECEIVED AS A SCP FOR MOVE-SCP

Maximum PDU size received	114KB(approximate)
---------------------------	--------------------

4.2.10.2.2. Number of Associations

Table 4.2-65
NUMBER OF ASSOCIATIONS AS A SCP FOR MOVE-SCP

Maximum number of simultaneous associations	Unlimited
---	-----------

4.2.10.2.3. Asynchronous nature

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

4.2.10.2.4. Implementation Identifying Information

Table 4.2-66
DICOM IMPLEMENTATION CLASS AND VERSION FOR MOVE-SCP

Implementation Class UID	1.2.826.0.1.3680043.214.1
Implementation Version Name	WIF 2.0

4.2.10.3. Association Initiation Policy

MOVE-SCP initiates an association with the AE specified as the Move Destination in the MOVE request, in order to store the requested instances. The remote AE must be in OptosAdvance’s pre-configured AE list.

4.2.10.4. Association Acceptance Policy

When MOVE-SCP accepts an association, it will respond to query requests. The association will be rejected if:

- The Called AE Title does not match the AE Title shared by all the SCPs of the application.
- The move destination AE Title is not in the application’s pre-configured list.

4.2.10.4.1. Activity – Receive MOVE Request

4.2.10.4.1.1. Description and Sequencing of Activities

As requests are received, a STORAGE-SCU operation is initiated to send the requested instances to the specified remote AE.

4.2.10.4.1.2. Accepted Presentation Context

Table 4.2-67

ACCEPTABLE PRESENTATION CONTEXTS FOR MOVE-SCP AND RECEIVED MOVE REQUEST

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4.2-63	See Table 4.2-63	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4.2.10.4.1.2.1. Extended Negotiation

No extended negotiation is performed and in particular, relational retrivals are not supported.

4.2.10.4.1.3. SOP Specific Conformance

4.2.10.4.1.3.1. SOP Specific Conformance to C-MOVE SOP Class

MOVE-SCP provides standard conformance to the supported C-MOVE SOP Classes.

The move is performed to the destination AE Title specified in the original request. If the destination AE does not exist in OptosAdvance’s pre-configured list, the store operations are not performed.

Table 4.2-68

STUDY ROOT REQUEST IDENTIFIER FOR MOVE-SCP

NAME	TAG	TYPE OF MATCHING
------	-----	------------------

Study Level		
Study Instance UID	(0020,000D)	UNIQUE, L
Series Level		
Study Instance UID	(0020,000D)	UNIQUE
Series Instance UID	(0020, 000E)	UNIQUE,L
Image Level		
Study Instance UID	(0020,000D)	UNIQUE
Series Instance UID	(0020, 000E)	UNIQUE
SOP Instance UID	(0008,0018)	UNIQUE,L

Table 4.2-69
 PATIENT ROOT REQUEST IDENTIFIER FOR MOVE-SCP

NAME	TAG	TYPE OF MATCHING
Patient Level		
Patient's ID	(0010,0020)	UNIQUE
Study Level		
Patient's ID	(0010,0020)	UNIQUE
Patient's ID	(0010,0020)	UNIQUE
Study Instance UID	(0020,000D)	UNIQUE,L
Series Level		
Patient's ID	(0010,0020)	UNIQUE
Study Instance UID	(0020,000D)	UNIQUE
Series Instance UID	(0020, 000E)	UNIQUE,L
Image Level		
Patient's ID	(0010,0020)	UNIQUE
Study Instance UID	(0020,000D)	UNIQUE
Series Instance UID	(0020, 000E)	UNIQUE
SOP Instance UID	(0008,0018)	UNIQUE,L

4.2.10.4.1.3.2. Presentation Context Acceptance Criterion

MOVE-SCP only accepts a Presentation Context compatible with the one listed in Table 4.2-67.

4.2.10.4.1.3.3. Transfer Syntax Selection Policies

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

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

4.2.10.4.1.3.4. Response Status

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

**Table 4.2-62
RESPONSE STATUS FOR MOVE-SCP AND RECEIVE MOVE REQUEST**

Service Status	Further Meaning	Status Codes	Reason
Failure	Refused: Move Destination unknown	A801	Destination AE title is not configured in OptosAdvance
	Identifier does not match SOP Class	A900	Sent when the Query/Retrieve Level in the request is not present or valid
	Unable to process	Cxxx	Sent if internal query is unsuccessful
Warning	Sub-operations complete with one or more failures	B000	At least one storage sub-operation has failed
Pending	Sub-operations are continuing	FF00	Storage sub-operations are in progress
Success	All sub-operations complete with no warnings or failures	0000	

4.2.10.5. Sub-operation Dependent Behavior

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

MOVE-SCP initiates a C-STORE sub-operation for each SOP instance that matches the information supplied in the C-MOVE request (for example, all SOP instances in a study). The responses from the MOVE-SCP are purely dependent on the success or failure of the C-STORE sub-operations, not on any explicit action by MOVE-SCP.

Whether or not the remote AE accepts the C-STORE sub-operations is beyond the control of MOVE-SCP.

If the association on which the C-MOVE was issued is aborted for any reason, the C-STORE sub-operations will continue.

If the C-MOVE operation is canceled by the remote AE, MOVE-SCP will attempt to cancel the remaining C-STORE sub-operation(s) and close the association.

4.2.11. WADO-RS SCP

This AE complies with Chapter 6 in PS3.18, specifications for WS, RS and URI access.

4.2.11.1. Retrieve Study/Series/Instances/Bulk Data/Frames

4.2.11.1.1. Data Type Supported

- Image/dicom+jpeg
- Image/dicom+rle
- Image/dicom+jp2

4.2.11.1.2. Transfer Syntaxes Supported

Transfer Syntax Name	Transfer Syntax UID
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
JPEG 2000 Lossy	1.2.840.10008.1.2.4.90
JPEG 2000 Lossless	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

4.2.11.1.3. SOP Class Restrictions

Restricted to the SOP classes supported by OptosAdvance, see full list in table Table 4.2-6.

4.2.11.1.4. Size Restriction

Restricted to size supported by OptosAdvance hosting environment.

4.2.11.2. Retrieve Metadata

4.2.11.2.1. Data Type Supported

Restricted to application/dicom+xml

4.2.11.2.2. Accept-Encoding

Restricted to gzip, deflate, or identity (the use of no transformation whatsoever). See W3C RFC 2616 Protocol Parameters Section 3.5 for more information (<http://www.w3.org/Protocols/rfc2616/rfc2616-sec3.html>).

4.2.11.2.3. SOP Class Restrictions

Restricted to the SOP classes supported by OptosAdvance, see full list in Table 4.2-6.

4.2.11.2.4. Size Restriction

Restricted to size supported by OptosAdvance hosting environment.

4.2.11.3. Connection Policies

4.2.11.3.1. General

All standard RS connection policies apply. There are no extensions for RS options.

4.2.11.3.2. Number of Connections

OptosAdvance does not limit the number of simultaneous RS requests.

4.2.11.3.3. Asynchronous Nature

OptosAdvance does not support RS asynchronous response.

4.2.12. STOW-RS SCP

This AE complies with Section 6.6 “STOW-RS Request/Response” in PS3.18, specification for STOW-RS storage.

4.2.12.1. Store Instance

4.2.12.1.1. Data Type Supported

- multipart/related; type=application/dicom;

4.2.12.1.2. Transfer Syntaxes Supported

Transfer Syntax Name	Transfer Syntax UID
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
JPEG 2000 Lossy	1.2.840.10008.1.2.4.90
JPEG 2000 Lossless	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

4.2.12.1.3. SOP Class Restrictions

Restricted to the SOP classes supported by OptosAdvance, see full list in table Table 4.2-6.

4.2.12.1.4. Size Restriction

Restricted to size supported by OptosAdvance hosting environment.

4.2.12.2. Connection Policies

4.2.12.2.1. General

All standard RS connection policies apply. There are no extensions for RS options.

4.2.12.2.2. Number of Connections

OptosAdvance does not limit the number of simultaneous RS requests.

4.2.12.2.3. Asynchronous Nature

OptosAdvance does not support RS asynchronous response.

4.2.13. QIDO-RS SCP

This AE complies with Section 6.7 in PS3.18, specification for QIDO-RS.

4.2.13.1. Search for Studies

4.2.13.1.1. Data Type Supported

- multipart/related; type=application/dicom+xml
- application/json;

4.2.13.1.2. Matching Attributes

- Accession Number
- Modalities in Study
- Referring Physician's Name
- Patient's Name
- Patient Id
- Study Id
- Study Instance UID
- Study Date
- Patients Birth Date

4.2.13.1.3. Return Attributes

- Specific Character Set
- Study Date
- Study Time
- Accession Number
- Referring Physicians Name
- Time zone Offset From UTC
- Patients Name
- Patient Id
- Patients Birth Date
- Patients Sex
- Study Id
- Study Instance UID
- Instance Availability
- Modalities In Study
- Number Of Study Related Series
- Number Of Study Related Instances
- Retrieve URL

4.2.13.1.4. Limit and Offset Support

Not Supported

4.2.13.1.5. Person Name Matching.

Support literal and case insensitive matching

4.2.13.2. Search for Series

4.2.13.2.1. Data Type Supported

- multipart/related; type=application/dicom+xml
- application/json;

4.2.13.2.2. Matching Attributes

- Study Instance UID
- Modality
- Series Number
- Series Instance UID

4.2.13.2.3. Return Attributes

- Specific Character Set
- Modality
- Time zone Offset From UTC
- Series Description
- Series Number
- Series Instance UID
- Performed Procedure Step Start Date
- Performed Procedure Step Start Time
- Request Attributes Sequence
- Instance Availability
- Number Of Series Related Instances
- Retrieve URL

4.2.13.2.4. Limit and Offset Support

Not Supported

4.2.13.2.5. Relational Query Supported

Not Supported

4.2.13.3. Search for Instances

4.2.13.3.1. Data Type Supported

- multipart/related; type=application/dicom+xml
- application/json;

4.2.13.3.2. Matching Attributes

- Study Instance UID
- Modality
- Series Number

- Series Instance UID

4.2.13.3.3. Return Attributes

- Specific Character Set
- SOP Class UID
- SOP Instance UID
- Time zone Offset From UTC
- Instance Number
- Rows
- Columns
- Bits Allocated
- Bits Stored
- Number of Frames
- Instance Availability
- Retrieve URL

4.2.13.3.4. Limit and Offset Support

Not Supported

4.2.13.3.5. Relational Query Supported

Not Supported

4.2.13.4. Connection Policies

4.2.13.4.1. General

All standard RS connection policies apply. There are no extensions for RS options.

4.2.13.4.2. Number of Connections

OptosAdvance does not limit the number of simultaneous RS requests.

4.2.13.4.3. Asynchronous Nature

OptosAdvance does not support RS asynchronous response.

4.2.14. WADO-RS SCU

This AE complies with Chapter 6 in PS3.18, specifications for WADO-RS access.

4.2.14.1. Retrieve Study/Series/Instances/Bulk Data/Frames

4.2.14.1.1. Data Type Supported

- Image/dicom+jpeg
- Image/dicom+rle
- Image/dicom+jp2

4.2.14.1.2. Transfer Syntaxes Supported

Transfer Syntax Name	Transfer Syntax UID
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50

JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
JPEG 2000 Lossy	1.2.840.10008.1.2.4.90
JPEG 2000 Lossless	1.2.840.10008.1.2.4.91
RLE Lossless	1.2.840.10008.1.2.5

4.2.14.1.3. SOP Class Restrictions

Restricted to the SOP classes supported by OptosAdvance, see full list in table Table 4.2-6.

4.2.14.1.4. Size Restriction

Restricted to size supported by OptosAdvance hosting environment.

4.2.14.2. Retrieve Metadata

4.2.14.2.1. Data Type Supported

Restricted to application/dicom+xml

4.2.14.2.2. Accept-Encoding

Restricted to gzip, deflate, or identity (the use of no transformation whatsoever). See W3C RFC 2616 Protocol Parameters Section 3.5 for more information (<http://www.w3.org/Protocols/rfc2616/rfc2616-sec3.html>).

4.2.14.2.3. SOP Class Restrictions

Restricted to the SOP classes supported by OptosAdvance, see full list in Table 4.2-6.

4.2.14.2.4. Size Restriction

Restricted to size supported by OptosAdvance hosting environment.

4.2.14.3. Connection Policies

4.2.14.3.1. General

All standard RS connection policies apply. There are no extensions for RS options.

4.2.14.3.2. Number of Connections

OptosAdvance does not limit the number of simultaneous RS requests.

4.2.14.3.3. Asynchronous Nature

OptosAdvance does not support RS asynchronous response.

4.2.15. WADO-WS SCU

This AE complies with Chapter 6 in PS3.18, specifications for WADO-WS access.

4.2.15.1. Retrieve Imaging Document Set

DICOM instances are encapsulated in a Web Services response.

4.2.15.1.1. Request

OptosAdvance uses the Web Services parameters and WSAL definition as defined in DICOM Standard PS3.18 section 6.4.4.1 WS – RetrieveImagingDocumentSet Request.

4.2.15.1.2. List of Character Sets Supported

The "Accept-charset" field of the GET method is not present.

4.2.15.2. Connection Policies

4.2.15.2.1. General

All standard WADO-WS connection policies apply. There are no extensions for WADO-WS options.

4.2.15.2.2. Number of Connections

OptosAdvance does not limit the number of simultaneous WADO-WS requests.

4.2.16. WADO-URI SCU

4.2.16.1. Retrieve Objects

4.2.16.1.1. Data Type Supported

- application/dicom

4.2.16.1.2. Parameters of the HTTP Request

The parameters of the query component of the Request-URI to be sent to the web Server through the HTTP GET method request are encoded as defined in IETF RFC3986.

4.2.16.1.3. List of Character Sets Supported

The "Accept-charset" field of the GET method is not present.

4.2.16.2. Connection Policies

4.2.16.2.1. General

All standard URI connection policies apply. There are no extensions for URI options.

4.2.16.2.2. Number of Connections

OptosAdvance does not limit the number of simultaneous WADO-URI requests.

4.2.17. STWO-RS SCU

This AE complies with Chapter 6 in PS3.18, specifications for STOW-RS access.

4.2.17.1. Store Instances

4.2.17.1.1. Data Type Supported

- multipart/related; type=application/dicom;

4.2.17.1.2. SOP Class Restrictions

Restricted to the SOP classes supported by OptosAdvance, see full list in table Table 4.2-6.

4.2.17.1.3. Size Restriction

Restricted to size supported by OptosAdvance hosting environment.

4.2.17.2. Connection Policies

4.2.17.2.1. General

All standard RS connection policies apply. There are no extensions for RS options.

4.2.17.2.2. Number of Connections

OptosAdvance does not limit the number of simultaneous RS requests.

4.2.17.2.3. Asynchronous Nature

OptosAdvance does not support RS asynchronous response.

4.2.18. QIDO-RS SCU

This AE complies with Section 6.7 in PS3.18, specification for QIDO-RS.

4.2.18.1. Search for Studies

4.2.18.1.1. Data Type Supported

- multipart/related; type=application/dicom+xml
- application/json;

4.2.18.1.2. Matching Attributes

- Patient Id
- Patient Name
- Patient Sex
- Patient Birth Date
- Accession Number
- Referring Physician
- Study UID
- Study ID
- Study Description
- Study Date
- Modalities In Study

4.2.18.1.3. Limit and Offset Support

Not Supported

4.2.18.1.4. Person Name Matching.

Support literal and case insensitive matching

4.2.18.2. Search for Series

4.2.18.2.1. Data Type Supported

- multipart/related; type=application/dicom+xml
- application/json;

4.2.18.2.2. Matching Attributes

- Study Instance UID
- Modality
- Series Number
- Series Instance UID
- Performed Procedure Step Start Date
- Performed Procedure Step Start Time
- Scheduled Procedure Step Id
- Requested Procedure Id

4.2.18.2.3. Limit and Offset Support

Not Supported

4.2.18.2.4. Relational Query Supported

Not Supported

4.2.18.3. Search for Instances

4.2.18.3.1. Data Type Supported

- multipart/related; type=application/dicom+xml
- application/json;

4.2.18.3.2. Matching Attributes

- SOP Class UID
- SOP Instance UID
- Instance Number

4.2.18.3.3. Limit and Offset Support

Not Supported

4.2.18.3.4. Relational Query Supported

Not Supported

4.2.18.4. Connection Policies

4.2.18.4.1. General

All standard RS connection policies apply. There are no extensions for RS options.

4.2.18.4.2. Number of Connections

OptosAdvance does not limit the number of simultaneous RS requests.

4.2.18.4.3. Asynchronous Nature

OptosAdvance does not support RS asynchronous response.

4.3.NETWORK INTERFACES

4.3.1.Physical Network Interface

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

4.3.2.Additional Protocols

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

4.3.3.IPv4 and IPv6 Support

By default, this product supports IPv4. When configured, it will also support IPv6. It does not utilize any of the optional configuration identification or security features of IPv6.

4.4.CONFIGURATION

All configuration of the application is performed through the use of Nil Read application DICOM Configuration View or Nil Dicom Service configuration file stored in the same directory with the Nil application executable.

4.4.1.AE Title/Presentation Address Mapping

The Calling AE Title of the local application is configurable in the Nil Read DICOM Configuration View. The mapping of the logical name by which remote AEs are described in the user interface to Called AE Titles as well as presentation address (hostname or IP address and port number) are configurable in the Nil Read DICOM Configuration View and stored in the internal databases/configuration files.

4.4.1.1. Parameters

Table 4.4-1
CONFIGURATION PARAMETERS TABLE

Parameter	Configurable	Default Value
General Parameters		
PDU size	No	N/A
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	Yes	1 hour
General DIMSE level time-out values	No	30 seconds
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	Yes	10 seconds
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	Yes	30 seconds

Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	Yes	30 seconds
Send Buffer Size (TCP/IP socket)	Yes	118341 bytes
Receive Buffer Size (TCP/IP socket)	Yes	118341 bytes
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	None
AE Specific Parameters (all AEs)		
Size constraint in maximum object size	No	None
Maximum PDU size the AE can receive	Yes	116794 bytes
Maximum PDU size the AE can send	Yes	116794 bytes
AE specific DIMSE level time-out values	No	30 seconds
Number of simultaneous Associations by Service and/or SOP Class	No	10

4.4.2.RS Interface

The OptosAdvance can be configured to respond on two ports, one for unprotected HTTP traffic and one for TLS protected traffic. The TLS port will refuse any connection from a system that is not recognized as authenticated by a known authority.

4.4.2.1. WADO-RS SCP

Access point: {NIL server base URL}/dicom-rs/wado

4.4.2.2. STOW-RS SCP

Access point: {NIL server base URL}/dicom-rs/stow

4.4.2.3. QIDO-RS SCP

Access Point: {NIL server base URL}/dicom-rs/qido

5. Media Interchange

Not Applicable.

6. Support of Character Sets

6.1.Overview

The system supports all extended character sets defined in the DICOM 2008 standard, including single-byte and multi-byte character sets as well as code extension techniques using ISO 2022 escapes.

Support extends to correctly decoding and displaying the correct symbol for all names and strings found in storage instances from media and received over the network, and in the local database.

6.2.Character Sets

In addition to the default character repertoire, the Defined Terms for Specific Character Set in Table 5.2-1 are supported:

Table 5.2-1
SUPPORTED SPECIFIC CHARACTER SET DEFINED TERMS

Character Set Description	Defined Term
Latin alphabet No. 1	ISO_IR 100
Latin alphabet No. 2	ISO_IR 101
Latin alphabet No. 3	ISO_IR 109
Latin alphabet No. 4	ISO_IR 110
Cyrillic	ISO_IR 144
Arabic	ISO_IR 127
Greek	ISO_IR 126
Hebrew	ISO_IR 138
Latin alphabet No. 5	ISO_IR 148
Japanese	ISO_IR 13
Thai	ISO_IR 166
Unicode in UTF-8	ISO_IR 192
Default repertoire	ISO 2022 IR 6
Latin alphabet No. 1	ISO 2022 IR 100
Latin alphabet No. 2	ISO 2022 IR 101
Latin alphabet No. 3	ISO 2022 IR 109
Latin alphabet No. 4	ISO 2022 IR 110
Cyrillic	ISO 2022 IR 144
Arabic	ISO 2022 IR 127
Greek	ISO 2022 IR 126
Hebrew	ISO 2022 IR 138
Latin alphabet No. 5	ISO 2022 IR 148
Thai	ISO 2022 IR 166

Japanese	ISO 2022 IR 87
Japanese	ISO 2022 IR 159
Japanese	ISO 2022 IR 149
Chinese (Simplified) Extended	GB18030
Japanese	ISO 2022 IR 13

7. Security

7.1. Security Profiles

Not supported

7.2. Association Level Security

The STORAGE-SCP checks the following DICOM values when determining whether to accept Association Open Requests:

Called AE Title, Application Context

The MOVE-SCP checks the following DICOM values when determining whether to accept Association Open Requests:

Called AE Title, Calling AE Title, Application Context

Each SCP AE checks that the Association requestor specifies the correct Called AE Title for the SCP.

7.3. Transport Level Security

OptosAdvance supports transport level security measures for RS access.

OptosAdvance supports the following transport level security measures:

- None
- HTTP BASIC Authentication over SSL
- SSL Client Certificates
- HTTP Forms Authentication over SSL

8. Annexes

8.1. IOD Contents

8.1.1. Created SOP Instances

The following tables use a number of abbreviations.

- ALWAYS: Attribute is always present with a non-zero-length value
- ANAP: Attribute is not always present
- NEVER: Attribute is never included
- VNAP: Value not always present (attribute sent zero-length if no value)

The abbreviations indicating the “Source” of the values are:

- AUTO: The attribute value is generated automatically or indirectly from previous user input
- COPY: The attribute value is copied verbatim from the referenced SOP instances
- USER: The attribute value is taken directly from user input

The ‘reference’ column refers to sections in DICOM standard P.S 3.3 -2009

8.1.1.1. Key Object Selection Document IOD

Table 6.1-1

IOD OF CREATED GRAYSCALE SOFTCOPY PRESENTATION STATE SOP INSTANCES

IE	Module	Reference	Presence of Module	Source
Patient	Patient	C.7.1.1	VNAP	COPY
	Clinical Trial Subject	C.7.1.3	ANAP	COPY
Study	General Study	C.7.2.1	ALWAYS	COPY
	Patient Study	C.7.2.2	ANAP	COPY
	Clinical Trial Study	C.7.2.3	ANAP	COPY
Series	General Series	C.7.3.1	ALWAYS	AUTO
	Clinical Trial Series	C.7.3.2	NEVER	N/A
	Key Object Document Series	C.17.6.1	ALWAYS	AUTO
Equipment	General Equipment	C.7.5.1	ALWAYS	AUTO
Document	Key Object Document	C.17.6.2	ALWAYS	AUTO
	SR Document Content	C.17.3	ALWAYS	AUTO
	SOP Common	C.12.1	ALWAYS	AUTO

8.1.1.2. Secondary Capture Image IOD

Table 6.1-2

IOD OF CREATED SECONDARY CAPTURE IMAGE SOP INSTANCES

IE	Module	Reference	Presence of Module	Source
Patient	Patient	C.7.1.1	VNAP	COPY
	Clinical Trial Subject	C.7.1.3	ANAP	COPY
Study	General Study	C.7.2.1	ALWAYS	COPY
	Patient Study	C.7.2.2	ANAP	COPY
	Clinical Trial Study	C.7.2.3	ANAP	COPY
Series	General Series	C.7.3.1	ALWAYS	COPY
	Clinical Trial Series	C.7.3.2	NEVER	N/A
Equipment	General Equipment	C.7.5.1	ALWAYS	AUTO
	SC Equipment	C.8.6.1	ALWAYS	AUTO
Image	General Image	C.7.6.1	ALWAYS	AUTO
	Image Pixel	C.7.6.3	ALWAYS	AUTO
	Device	C.7.6.12	NEVER	N/A
	SC Image	C.8.6.2	ALWAYS	AUTO
	Overlay Plane	C.9.2	NEVER	N/A
	Modality LUT	C.11.1	NEVER	N/A
	VOI LUT	C.11.2	NEVER	N/A
	SOP Common	Table 8.1-27	ALWAYS	AUTO

8.2.Data Dictionary of Private Attributes

Not Applicable

8.3.Coded Terminology and Templates

Not Applicable

8.4.Greyscale Image Consistency

No specific support to ensure grayscale image consistency.

8.5.Standard Extended or Specialized Private SOP Classes

No standard extended, specialized or private SOP classes are used.

8.6.Private Transfer Syntaxes

No private transfer syntaxes are used