



ImageGrid PACS™
Conformance Statement
Version 2.0

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Issued in U.S.A.

Rev. 1.1 – 04/13

<http://www.candelis.com>

1. CONFORMANCE STATEMENT OVERVIEW

ImageGrid PACS provides transfer and storage service of DICOM objects. It also supports query and retrieval of DICOM objects across the network with other DICOM 3.0 compliant systems.

All storage *SOP Classes* defined as of DICOM 2011 can be received, stored, and transmitted by the ImageGrid PACS.

**Table 1-1
NETWORK SERVICES**

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
All services of the Transfer Service Class	Yes	Yes
Query/Retrieve		
Patient Root Query/Retrieve Information Model - FIND	Yes	Yes
Patient Root Query/Retrieve Information Model - MOVE	No	Yes
Patient Root Query/Retrieve Information Model - GET	No	Yes
Study Root Query/Retrieve Information Model - FIND	Yes - Relational by Default	Yes
Study Root Query/Retrieve Information Model - MOVE	Yes - Relational by Default	Yes
Study Root Query/Retrieve Information Model - GET	No	Yes
Patient/Study Only Query/Retrieve Information Model - FIND (Retired)	No	Yes
Patient/Study Only Query/Retrieve Information Model - MOVE (Retired)	No	Yes
Patient/Study Only Query/Retrieve Information Model - GET (Retired)	No	Yes
Worklist Management		
Modality Worklist Information Model - FIND	Yes	Yes
Modality Performed Procedure Step SOP Class	No	Yes

Storage Commitment Push Model SOP Class	No	Yes
Candelis Study Status Change SOP Class	Yes	Yes

**Table 1-2
MEIDA SERVICES**

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

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3. INTRODUCTION

3.1 REVISION HISTORY

Document Version	Date of Issue	Author	Description
1.1	April 3, 2013	Jamie Ma	Version of Final Text

3.2 AUDIENCE

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

3.3 REMARKS

The scope of this DICOM Conformance Statement is to facilitate integration between ImageGrid PACS and other DICOM products. The Conformance Statement should be read and understood in conjunction with 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.

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

- The comparison of different Conformance Statement is just the first step towards assessing interconnectivity and interoperability between the product and other DICOM conformant equipment.
- Test procedures should be defined and executed to validate the required level of interoperability with specific compatible DICOM equipment, as established by the healthcare facility.

ImageGrid PACS has participated in an industry-wide testing program sponsored by Integrating the Healthcare Enterprise (IHE). The IHE Integration Statement for ImageGrid PACS, together with the IHE Technical Framework, may facilitate the process of validation testing.

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*, Modality Worklist Information Model Find *SOP Class*, Computed Radiography Image Storage *SOP Class*.

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

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

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

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

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).

Module – a set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient *Module* includes Patient's Name, Patient ID, Patient's Birth Date, and Patient's 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*), Radiology Information System (modality worklist *SCP*).

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

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

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

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

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

3.6 ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title

CD-R	Compact Disk Recordable
DICOM	Digital Imaging and Communications in Medicine
FSC	File-Set Creator
FSU	File-Set Updater
FSR	File-Set Reader
HL7	Health Level 7 Standard
IHE	Integrating the Healthcare Enterprise
IOD	Information Object Definition
ISO	International Organization for Standards
JPEG	Joint Photographic Experts Group
MPPS	Modality Performed Procedure Step
MTU	Maximum Transmission Unit (IP)
MWL	Modality Worklist
O	Optional (Key Attribute)
PACS	Picture Archiving and Communication System
PDU	Protocol Data Unit
R	Required (Key Attribute)
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
U	Unique (Key Attribute)
VR	Value Representation

3.7 REFERENCES

NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at <http://medical.nema.org/>

4. NETWORKING

4.1 IMPLEMENTATION MODEL

The DICOM Service on ImageGrid PACS acts as multiple *Application Entities* that support DICOM *Service Class Provider (SCP)* for Storage, Query/Retrieve, MWL, MPPS, Verification, and Storage Commitment operations. The service waits for external requests for *Association* from peer DICOM compliant *Application Entity*, and establishes the connection for storing, querying and retrieving images, and other workflow management, after the peer's access privilege is successfully verified.

Using ImageGrid PACS's Administration Web Interface, *Application Entity Titles* of its peer *Application Entities* and other DICOM network parameters can be configured.

4.1.1 Application Data Flow

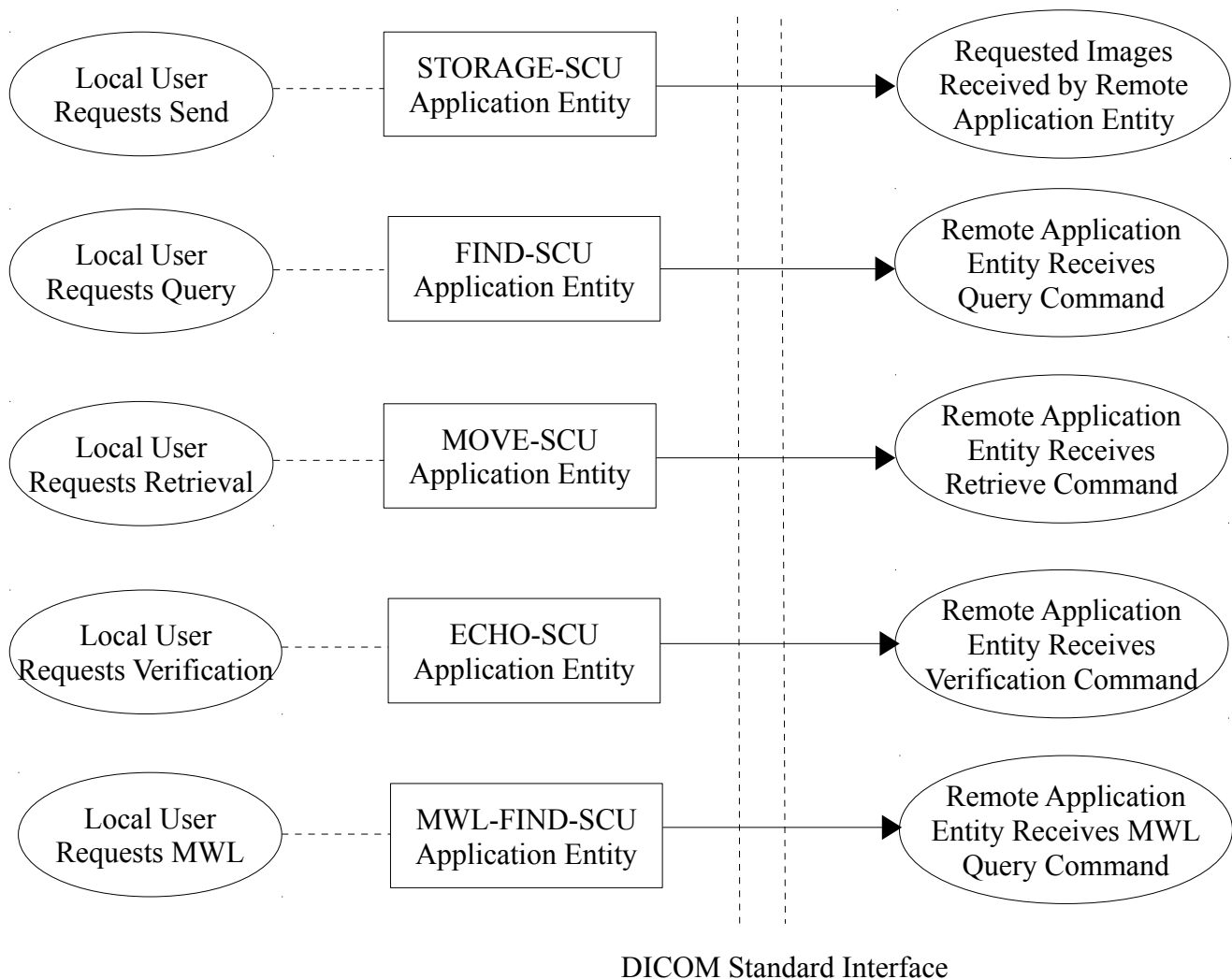
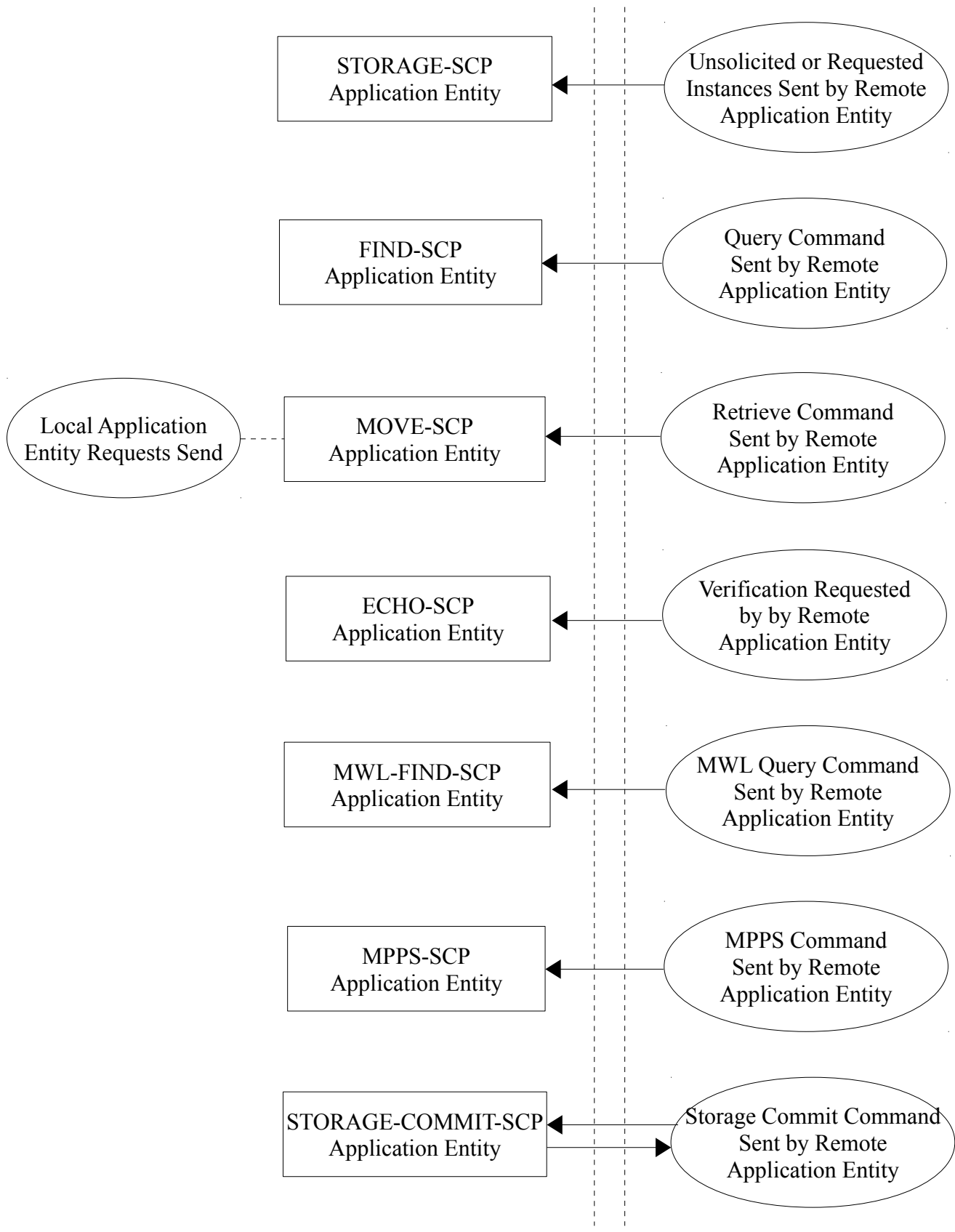


Figure 1: SCU IMPLEMENTATION MODEL



DICOM Standard Interface

Figure 2: SCP IMPLEMENTATION MODEL

4.1.2 Functional Definitions of AE's

The DICOM Service that listens on the network spawns an additional process to handle each incoming connections.

Conceptually the DICOM Service may be modeled to provide functionality on separate AE's, each dedicated for a specific Service Class, though in fact all AE's can share one or multiple common AE Titles. If multiple AE's with different AE Titles are configured, each of them functions independently to provide all the supported Service Classes.

There is a limit on the number of connections DICOM Service can handle concurrently. The maximum number of concurrent connections can be configured from the Administration Web Interface.

4.1.2.1 ECHO-SCP

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

4.1.2.2 STORAGE-SCP

DICOM Service waits in the background for connections, will accept *Associations* with *Presentation Contexts* for *SOP Classes* of the Storage Service Class, and will dispatch a STORAGE-SCP to store the received instances to the local AE, where they may subsequently be listed and viewed through various user interfaces.

4.1.2.3 FIND-SCP

DICOM Service waits in the background for connections, will accept *Associations* with *Presentation Contexts* for supported *SOP Classes* of the Query Service Class, and will dispatch a FIND-SCP to perform patient, study, series, instance query to the database based on the request, and return matching results.

4.1.2.4 MOVE-SCP

DICOM Service waits in the background for connections, will accept *Associations* with *Presentation Contexts* for supported *SOP Classes* of the Retrieve Service Class, and will dispatch a MOVE-SCP to locate the requested objects, and further trigger the SEND-SCU to send the objects to the requested destination.

4.1.2.5 MWL-FIND-SCP

DICOM Service waits in the background for connections, will accept *Associations* with *Presentation Contexts* for the Modality Worklist Information Model FIND, and will dispatch a MWL-FIND-SCP to perform MWL query to the database based on the request, and return matching results.

4.1.2.6 MPPS-SCP

DICOM Service waits in the background for connections, will accept *Associations* with *Presentation Contexts* for the Modality Performed Procedure Step *SOP Class*, and will dispatch a MPPS-SCP to update the matching MPPS status in the database.

4.1.2.7 STORAGE-COMMITMENT-SCP

DICOM Service waits in the background for connections, will accept *Associations* with *Presentation Contexts* for the Storage Commitment Push Model *SOP Class*, and will dispatch a STORAGE-COMMITMENT-SCP to verify the storage status on the requested instances, and further sends the N-EVENT-REPORT response.

4.1.2.8 ECHO-SCU

ECHO-SCU is activated through the remote AE configuration from the Administration Web Interface. The connectivity of the remote AE's can be verified by issuing echo requests.

4.1.2.9 STORAGE-SCU

STORAGE-SCU is activated through routing, either automatically triggered by routing and pre/post-fetching policies, or manually triggered by the user selecting study, series, or instance and requesting transfer to other local or remote AE's.

4.1.2.10 FIND-SCU

FIND-SCU can be activated through pre/post-fetching service when searching for prior studies in a remote AE. It also can be activated through the Administration Web Interface when the user selects a remote AE to query. Series and instance level query can be initiated if a remote study or series object is expanded.

4.1.2.11 MOVE-SCU

MOVE-SCU can be activated through pre/post-fetching service when pulling prior studies from a remote AE. It also can be activated when the user selects remote study, series, or instance from the Administration Web Interface, and requests for transfer to other local or remote AE's. A connection to the remote AE is established to initiate and monitor the retrieval, and the STORAGE-SCP AE on the move destination receives the retrieved instances.

4.1.2.12 MWL-FIND-SCU

MWL-FIND-SCU is activated through pre-fetching service when searching for scheduled exams in a pre-configured modality worklist. The find request is constructed based on the pre-fetching settings and pre-fetching policies.

4.1.3 Sequencing of Real World Activities

Real world activities, as depicted in figure 1 and 2, may take place independent of each other and there are no sequencing constraints.

4.2 AE SPECIFICATIONS

4.2.1 Echo

4.2.1.1 SOP Classes

ECHO-SCU and ECHO-SCP provides standard conformance to the following *SOP Class*:

Table 4-1
SOP CLASS SUPPORTED BY ECHO

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	Yes

4.2.1.2 Association Policies

4.2.1.2.1 General

Table 4-2
DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Table 4-3
MAXIMUM PDU SIZE RECEIVED FOR ECHO

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.1.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-4
NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR ECHO

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

Table 4-5
NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR ECHO

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.1.2.3 Asynchronous Nature

Echo will only allow a single outstanding operation on an *Association*. Therefore,

Echo will not perform asynchronous operations window *Negotiation*.

Table 4-6
ASYNCHRONOUS NATURE FOR ECHO

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

4.2.1.2.4 Implementation Identifying Information

Table 4-7
DICOM IMPLEMENTATION CLASS AND VERSION FOR ECHO

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Send Echo Request

4.2.1.3.1.1 Description and Sequencing of Activities

Echo request can be initiated by the user performing a remote AE verification from the Administration Web Interface.

4.2.1.3.1.2 Proposed Presentation Contexts

Table 4-8
PROPOSED PRESENTATION CONTEXTS FOR ECHO-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

ECHO-SCU proposes only one *Presentation Context* for the Verification *SOP Class*, with the above three native *Transfer Syntaxes*.

4.2.1.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.1.3.1.3 SOP Specific Conformance

4.2.1.3.1.3.1 SOP Specific Conformance to Verification SOP Class

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

4.2.1.3.1.3.2 Presentation Context Acceptance Criterion

ECHO-SCU does not accept *Association*.

4.2.1.3.1.3.3 Transfer Syntax Selection Policies

As ECHO-SCU only proposes one *Presentation Context* for the Verification *SOP Class*, it will use any of the *Transfer Syntaxes* accepted by the remote ECHO-SCP.

4.2.1.4 Association Acceptance Policy

4.2.1.4.1 Activity – Receive Echo Request

4.2.1.4.1.1 Description and Sequencing of Activities

When ECHO-SCP is dispatched upon Echo requests, it responds to the ECHO-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted permission to access the Called AE Title, the *Association* will be rejected too.

4.2.1.4.1.2 Accepted Presentation Contexts

Table 4-9

ACCEPTABLE PRESENTATION CONTEXTS FOR ECHO-SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	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 Presentation Context Acceptance Criterion

ECHO-SCP will always accept any *Presentation Context* for the Verification SOP Class with the supported *Transfer Syntax*. 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*.

4.2.1.4.1.3.3 Transfer Syntax Selection Policies

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

Table 4-10

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR ECHO-SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

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

4.2.2 Storage

4.2.2.1 SOP Classes

STORAGE-SCU and STORAGE-SCP provides standard conformance to the following *SOP Class(es)*:

Table 4-11

SOP CLASS(ES) SUPPORTED BY STORAGE

SOP Class Name	SOP Class UID	SCU	SCP
Stored Print Storage (Retired)	1.2.840.10008.5.1.1.27	Yes	Yes
Hardcopy Grayscale Image Storage (Retired)	1.2.840.10008.5.1.1.29	Yes	Yes
Harcopy Color Image Storage (Retired)	1.2.840.10008.5.1.1.30	Yes	Yes
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	Yes	Yes
Digital XRay Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Yes	Yes
Digital XRay Image Storage	1.2.840.10008.5.1.4.1.1.1.1.1	Yes	Yes

For Processing			
Digital Mammography XRay Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital Mammography XRay Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	Yes	Yes
Digital Intra Oral XRay Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Yes	Yes
Digital Intra Oral XRay Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1	Yes	Yes
Ultrasound Multiframe Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	Yes	Yes
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Yes	Yes
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	Yes	Yes
Enhanced MR Color Image Storage	1.2.840.10008.5.1.4.1.1.4.3	Yes	Yes
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	Yes	Yes
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Yes	Yes
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	Yes
Enhanced US Volume Storage	1.2.840.10008.5.1.4.1.1.6.2	Yes	Yes
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	Yes
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	Yes	Yes
Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	Yes	Yes
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	Yes	Yes
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	Yes

Standalone Overlay Storage (Retired)	1.2.840.10008.5.1.4.1.1.8	Yes	Yes
Standalone Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.9	Yes	Yes
Waveform Storage (Draft)	1.2.840.10008.5.1.4.1.1.9.1	Yes	Yes
Twelve Lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	Yes	Yes
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	Yes	Yes
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	Yes	Yes
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	Yes	Yes
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	Yes	Yes
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	Yes	Yes
General Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.2	Yes	Yes
Arterial Pulse Waveform Storage	1.2.840.10008.5.1.4.1.1.9.5.1	Yes	Yes
Respiratory Waveform Storage	1.2.840.10008.5.1.4.1.1.9.6.1	Yes	Yes
Standalone Modality LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.10	Yes	Yes
Standalone VOI LUT Storage (Retired)	1.2.840.10008.5.1.4.1.1.11	Yes	Yes
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Yes	Yes
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2	Yes	Yes
Pseudo Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3	Yes	Yes
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4	Yes	Yes
XAX RF Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.5	Yes	Yes
XRay Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Yes	Yes
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1	Yes	Yes
XRay Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Yes	Yes

Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1	Yes	Yes
XRay Angiographic Bi Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	Yes	Yes
XRay 3D Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.13.1.1	Yes	Yes
XRay 3D Craniofacial Image Storage	1.2.840.10008.5.1.4.1.1.13.1.2	Yes	Yes
Breast Tomosynthesis Image Storage	1.2.840.10008.5.1.4.1.1.13.1.3	Yes	Yes
Intravascular Optical Coherence Tomography Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.14.1	Yes	Yes
Intravascular Optical Coherence Tomography Image Storage For Processing	1.2.840.10008.5.1.4.1.1.14.2	Yes	Yes
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	Yes	Yes
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2	Yes	Yes
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	Yes	Yes
Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.4	Yes	Yes
Surface Segmentation Storage	1.2.840.10008.5.1.4.1.1.66.5	Yes	Yes
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67	Yes	Yes
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	Yes	Yes
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	Yes	Yes
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1	Yes	Yes
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	Yes	Yes
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1	Yes	Yes
VL Slide Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	Yes	Yes
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	Yes	Yes
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1	Yes	Yes

Ophthalmic Photography 8Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1	Yes	Yes
Ophthalmic Photography 16Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2	Yes	Yes
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3	Yes	Yes
Ophthalmic Tomography Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.4	Yes	Yes
VL Whole Slide Microscopy Image Storage	1.2.840.10008.5.1.4.1.1.77.1.6	Yes	Yes
VL Multi Frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	Yes	Yes
Lensometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.1	Yes	Yes
Autorefracton Measurements Storage	1.2.840.10008.5.1.4.1.1.78.2	Yes	Yes
Keratometry Measurements Storage	1.2.840.10008.5.1.4.1.1.78.3	Yes	Yes
Subjective Refraction Measurements Storage	1.2.840.10008.5.1.4.1.1.78.4	Yes	Yes
Visual Acuity Measurements Storage	1.2.840.10008.5.1.4.1.1.78.5	Yes	Yes
Spectacle Prescription Report Storage	1.2.840.10008.5.1.4.1.1.78.6	Yes	Yes
Ophthalmic Axial Measurements Storage	1.2.840.10008.5.1.4.1.1.78.7	Yes	Yes
Intraocular Lens Calculations Storage	1.2.840.10008.5.1.4.1.1.78.8	Yes	Yes
Macular Grid Thickness And Volume Report Storage	1.2.840.10008.5.1.4.1.1.79.1	Yes	Yes
Ophthalmic Visual Field Static Perimetry Measurements Storage	1.2.840.10008.5.1.4.1.1.80.1	Yes	Yes
Ophthalmic Thickness Map Storage	1.2.840.10008.5.1.4.1.1.81.1	Yes	Yes
SR Text Storage (Draft)	1.2.840.10008.5.1.4.1.1.88.1	Yes	Yes
SR Audio Storage (Draft)	1.2.840.10008.5.1.4.1.1.88.2	Yes	Yes
SR Detail Storage (Draft)	1.2.840.10008.5.1.4.1.1.88.3	Yes	Yes
SR Comprehensive Storage (Draft)	1.2.840.10008.5.1.4.1.1.88.4	Yes	Yes
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	Yes	Yes

Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	Yes	Yes
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	Yes	Yes
Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40	Yes	Yes
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50	Yes	Yes
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59	Yes	Yes
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65	Yes	Yes
XRay Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67	Yes	Yes
Colon CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.69	Yes	Yes
Implantation Plan SR Document Storage	1.2.840.10008.5.1.4.1.1.88.70	Yes	Yes
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1	Yes	Yes
Encapsulated CDA Storage	1.2.840.10008.5.1.4.1.1.104.2	Yes	Yes
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Standalone PET Curve Storage (Retired)	1.2.840.10008.5.1.4.1.1.129	Yes	Yes
Enhanced PET Image Storage	1.2.840.10008.5.1.4.1.1.130	Yes	Yes
Basic Structured Display Storage	1.2.840.10008.5.1.4.1.1.131	Yes	Yes
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	Yes	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6	Yes	Yes
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7	Yes	Yes
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8	Yes	Yes
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9	Yes	Yes
DICOS CT Image Storage	1.2.840.10008.5.1.4.1.1.501.1	Yes	Yes
DICOS Digital XRay Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.501.2.1	Yes	Yes

DICOS Digital XRay Image Storage For Processing	1.2.840.10008.5.1.4.1.1.501.2.2	Yes	Yes
DICOS Threat Detection Report Storage	1.2.840.10008.5.1.4.1.1.501.3	Yes	Yes
DICONDE Eddy Current Image Storage	1.2.840.10008.5.1.4.1.1.601.1	Yes	Yes
DICONDE Eddy Current Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.601.2	Yes	Yes
Stored Print Storage (Retired)	1.2.840.10008.5.1.1.27	Yes	Yes
Hardcopy Grayscale Image Storage (Retired)	1.2.840.10008.5.1.1.29	Yes	Yes
Hardcopy Color Image Storage (Retired)	1.2.840.10008.5.1.1.30	Yes	Yes
RT Beams Delivery Instruction Storage (Draft)	1.2.840.10008.5.1.4.34.1	Yes	Yes
RT Beams Delivery Instruction Storage	1.2.840.10008.5.1.4.34.7	Yes	Yes
Generic Implant Template Storage	1.2.840.10008.5.1.4.43.1	Yes	Yes
Implant Assembly Template Storage	1.2.840.10008.5.1.4.44.1	Yes	Yes
Implant Template Group Storage	1.2.840.10008.5.1.4.45.1	Yes	Yes
Varian Private Storage – LT Archive RT Treatment Record	1.2.246.352.70.1.10	Yes	Yes
GE Private Storage - RT Plan	1.2.840.113619.4.5.249	Yes	Yes
GE Private Storage	1.2.840.113619.4.25.1	Yes	Yes
GE Private Storage - DICOM 3D Object	1.2.840.113619.4.26	Yes	Yes
GE Private Storage - NM Genie	1.2.840.113619.4.27	Yes	Yes
GE Private Storage - PET Advance	1.2.840.113619.4.30	Yes	Yes
Siemens Private Storage	1.3.12.2.1107.5.9.1	Yes	Yes
Philips Private Storage	1.3.46.670589.11.0.0.12.1	Yes	Yes
Philips Private Storage	1.3.46.670589.11.0.0.12.2	Yes	Yes

4.2.2.2 Association Policies

4.2.2.2.1 General

Table 4-12

DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Table 4-13

MAXIMUM PDU SIZE RECEIVED FOR STORAGE

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.2.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-14

NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR STORAGE

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

Table 4-15

NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR STORAGE

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.2.2.3 Asynchronous Nature

Storage will only allow a single outstanding operation on an *Association*. Therefore, Storage will not perform asynchronous operations window *Negotiation*.

Table 4-16

ASYNCHRONOUS NATURE FOR STORAGE

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

4.2.2.2.4 Implementation Identifying Information

Table 4-17

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.2.3 Association Initiation Policy

STORAGE-SCU attempts to initiate a new *Association* for each study it attempts to

transfer. If only a series, or an instance is to be transferred, STORAGE-SCU will initiate a new *Association* for each series or instance.

4.2.2.3.1 Activity – Send Storage Request

4.2.2.3.1.1 Description and Sequencing of Activities

DICOM send of study, series, and instance can be initiated from the Administration Web Interface. It also can be initiated from the routing and pre/post-fetching services. If the first attempt of the send fails, multiple retries will be performed. The maximum number of retries is configurable.

4.2.2.3.1.2 Proposed Presentation Contexts

Table 4-18

PROPOSED PRESENTATION CONTEXTS FOR STORAGE-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4-11	See Table 4-11	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Transfer Syntax of the SOP Received		SCU	None
		Preferred Transfer Syntax of the Transfer		SCU	None

STORAGE-SCU proposes *Presentation Contexts* only for the *SOP Classes* of the instances that are to be transferred.

For each *SOP Class*, STORAGE-SCU proposes multiple *Presentation Contexts*, in order to determine which *Transfer Syntaxes* the remote STORAGE-SCP supports: one *Presentation Context* for the three native *Transfer Syntaxes*, one *Presentation Context* for the *Transfer Syntax* in which the *SOP* is received, and one separate *Presentation Context* for each encapsulated *Transfer Syntax* from the preferred *Transfer Syntaxes*.

STORAGE-SCU will not propose the three native *Transfer Syntaxes*, if decompression of the *Transfer Syntax* in which the *SOP* is received is not supported.

STORAGE-SCU will not propose any encapsulated *Transfer Syntax*, if the AE of the remote STORAGE-SCP is configured to disable encapsulated *Transfer Syntax*.

4.2.2.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.2.3.1.3 SOP Specific Conformance

4.2.2.3.1.3.1 SOP Specific Conformance to Storage SOP Class

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

4.2.2.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCU does not accept *Association*.

4.2.2.3.1.3.3 Transfer Syntax Selection Policies

If both native *Transfer Syntax* and encapsulated *Transfer Syntax* are accepted by the remote STORAGE-SCP, STORAGE-SCU will attempt to use the encapsulated *Transfer Syntax* over the native *Transfer Syntax*. Among the encapsulated *Transfer Syntaxes* that are accepted, STORAGE-SCU will attempt to use the most preferred *Transfer Syntax* configured.

The preferred *Transfer Syntaxes* can be configured from the routing service settings, routing policies, and pre/post-fetching policies. The preferred *Transfer Syntaxes* in the policies have higher priority than the one from the routing service settings.

4.2.2.4 Association Acceptance Policy

4.2.2.4.1 Activity – Receive Storage Request

4.2.2.4.1.1 Description and Sequencing of Activities

When the STORAGE-SCP is dispatched upon store requests, it processes and stores the DICOM instances, and responds to the STORAGE-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted write permission to access the Called AE Title, the *Association* will be rejected too.

As instances are received, they are copied to the local file system and corresponding records are inserted into the local database. If the received instance is a duplicate of a previously received instance, the duplicate policy for DICOM Service will apply.

4.2.2.4.1.2 Accepted Presentation Contexts

Table 4-19

ACCEPTABLE PRESENTATION CONTEXTS FOR STORAGE-SCP

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4-11	See Table 4-11	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		RLE Lossless	1.2.840.10008.1.2.5	SCP	None
		Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99	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 Extended (Process 3 & 5)	1.2.840.10008.1.2.4.52	SCP	None
		JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8)	1.2.840.10008.1.2.4.53	SCP	None
		JPEG Spectral Selection, Non-Hierarchical (Process 7 & 9)	1.2.840.10008.1.2.4.54	SCP	None
		JPEG Full Progression, Non-Hierarchical (Process 10 & 12)	1.2.840.10008.1.2.4.55	SCP	None
JPEG Full Progression,	1.2.840.10008.1.2.4.56	SCP	None		

		Non-Hierarchical (Process 11 & 13)			
		JPEG Lossless, Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57	SCP	None
		JPEG Lossless, Non-Hierarchical (Process 15)	1.2.840.10008.1.2.4.58	SCP	None
		JPEG Extended, Hierarchical (Process 16 & 18)	1.2.840.10008.1.2.4.59	SCP	None
		JPEG Extended, Hierarchical (Process 17 & 19)	1.2.840.10008.1.2.4.60	SCP	None
		JPEG Spectral Selection, Hierarchical (Process 20 & 22)	1.2.840.10008.1.2.4.61	SCP	None
		JPEG Spectral Selection, Hierarchical (Process 21 & 23)	1.2.840.10008.1.2.4.62	SCP	None
		JPEG Full Progression, Hierarchical (Process 24 & 26)	1.2.840.10008.1.2.4.63	SCP	None
		JPEG Full Progression, Hierarchical (Process 25 & 27)	1.2.840.10008.1.2.4.64	SCP	None

		JPEG Lossless, Hierarchical (Process 28)	1.2.840.10008.1.2.4.65	SCP	None
		JPEG Lossless, Hierarchical (Process 29)	1.2.840.10008.1.2.4.66	SCP	None
		JPEG Lossless, Non-Hierarchical, (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70	SCP	None
		JPEG-LS Lossless	1.2.840.10008.1.2.4.80	SCP	None
		JPEG-LS Lossy (Near-Lossless)	1.2.840.10008.1.2.4.81	SCP	None
		JPEG 2000 (Lossless Only)	1.2.840.10008.1.2.4.90	SCP	None
		JPEG 2000 (Lossless or Lossy)	1.2.840.10008.1.2.4.91	SCP	None
		JPEG 2000 Part 2 Multi-component (Lossless Only) *	1.2.840.10008.1.2.4.92	SCP	None
		JPEG 2000 Part 2 Multi-component (Lossless or Lossy) *	1.2.840.10008.1.2.4.93	SCP	None
		JPIP Referenced *	1.2.840.10008.1.2.4.94	SCP	None
		JPIP Referenced Deflate *	1.2.840.10008.1.2.4.95	SCP	None
		MPEG2 Main Profile @ Main Level *	1.2.840.10008.1.2.4.100	SCP	None
		MPEG2 Main	1.2.840.10008.1.2.4.	SCP	None

		Profile @ High Level *	101		
		MPEG-4 AVC/H.264 High Profile / Level 4.1 *	1.2.840.10008.1.2.4. 102	SCP	None
		MPEG-4 AVC/H.264 BD- compatible High Profile / Level 4.1 *	1.2.840.10008.1.2.4. 103	SCP	None

* *Transfer syntax* will be accepted, if the unprocessable *Transfer Syntaxes* are enabled for DICOM Service. However, no compression/decompression, or *Transfer Syntax* conversion is supported.

4.2.2.4.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

STORAGE-SCP is a Level 2 Storage *SCP* (Full – does not discard any data elements).

STORAGE-SCP does not support digital signatures.

STORAGE-SCP 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.

The following DICOM *Attributes* can be manually modified from the Administration Web Interface.

Table 4-20

MODIFIABLE DICOM ATTRIBUTES FOR STORAGE SOP CLASSES

Level	Attributes	Description
PATIENT	(0010,0020)	Patient ID
PATIENT	(0010,0010)	Patient's Name
PATIENT	(0010,0021)	Issuer of Patient ID
PATIENT	(0010,0030)	Patient's Birth Date
PATIENT	(0010,0032)	Patient's Birth Time
PATIENT	(0010,0040)	Patient's Sex
PATIENT	(0010,1000)	Other Patient IDs
PATIENT	(0010,1001)	Other Patient Names

PATIENT	(0010,2000)	Medical Alerts
PATIENT	(0010,2110)	Allergies
PATIENT	(0010,2154)	Patient Telephone Numbers
PATIENT	(0010,2160)	Ethnic Group
STUDY	(0010,1010)	Patient's Age
STUDY	(0010,1020)	Patient's Size
STUDY	(0010,1030)	Patient's Weight
STUDY	(0010,2180)	Patient's Occupation
STUDY	(0008,0020)	Study Date
STUDY	(0008,0030)	Study Time
STUDY	(0008,0050)	Accession Number
STUDY	(0008,0080)	Institution Name
STUDY	(0008,0090)	Referring Physician's Name
STUDY	(0008,1030)	Study Description
STUDY	(0008,1060)	Name of Physicians Reading Study
STUDY	(0008,1080)	Admitting Diagnoses Description
STUDY	(0020,0010)	Study ID
STUDY	(0032,1060)	Requested Procedure Description
SERIES	(0008,0021)	Series Date
SERIES	(0008,0031)	Series Time
SERIES	(0008,0060)	Modality
SERIES	(0008,103E)	Series Description
SERIES	(0008,1050)	Performing Physician's Name
SERIES	(0008,1070)	Operator's Name
SERIES	(0018,0015)	Body Part Examined
SERIES	(0018,1030)	Protocol Name
SERIES	(0020, 0011)	Series Number
SERIES	(0040,0253)	Performed Procedure Step ID
SERIES	(0040,0254)	Performed Procedure Step Description
IMAGE	(0008,0023)	Content Date
IMAGE	(0008,0033)	Content Time
IMAGE	(0020,0013)	Instance Number
IMAGE	(0020,4000)	Image Comments
IMAGE	(0070,0080)	Content Label
IMAGE	(0070,0081)	Content Description

IMAGE	(0070,0082)	Presentation Creation Date
IMAGE	(0070,0083)	Presentation Creation Time
IMAGE	(0070,0084)	Content Creator's Name

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 Syntax*. 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

If offered a choice of *Transfer Syntaxes* in a *Presentation Context*, STORAGE-SCP will apply the following priority to the choice of *Transfer Syntax*:

Table 4-21

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR STORAGE-SCP

Priority	Transfer Syntax Name
1	JPEG 2000 (Lossless Only)
2	JPEG-LS Lossless
3	JPEG Lossless, Non-Hierarchical, (Process 14 [Selection Value 1])
4	JPEG Lossless, Non-Hierarchical (Process 14)
5	RLE Lossless
6	Deflated Explicit VR Little Endian
7	Explicit VR Little Endian
8	Explicit VR Big Endian
9	Implicit VR Little Endian
10	JPEG 2000 (Lossless or Lossy)
11	JPEG-LS Lossy (Near-Lossless)
12	JPEG Lossless, Hierarchical (Process 29)
13	JPEG Lossless, Hierarchical (Process 28)
14	JPEG Full Progression, Hierarchical (Process 25 & 27)
15	JPEG Full Progression, Hierarchical (Process 24 & 26)
16	JPEG Spectral Selection, Hierarchical (Process 21 & 23)
17	JPEG Spectral Selection, Hierarchical (Process 20 & 22)
18	JPEG Extended, Hierarchical (Process 17 & 19)

19	JPEG Extended, Hierarchical (Process 16 & 18)
20	JPEG Lossless, Non-Hierarchical (Process 15)
21	JPEG Lossless, Non-Hierarchical (Process 14)
22	JPEG Full Progression, Non-Hierarchical (Process 11 & 13)
23	JPEG Full Progression, Non-Hierarchical (Process 10 & 12)
24	JPEG Spectral Selection, Non-Hierarchical (Process 7 & 9)
25	JPEG Spectral Selection, Non-Hierarchical (Process 6 & 8)
26	JPEG Extended (Process 3 & 5)
27	JPEG Extended (Process 2 & 4)
28	JPEG Baseline (Process 1)
29	MPEG-4 AVC/H.264 High Profile / Level 4.1 *
30	MPEG-4 AVC/H.264 BD-compatible High Profile / Level 4.1 *
31	MPEG2 Main Profile @ Main Level *
32	MPEG2 Main Profile @ High Level *
33	JPEG 2000 Part 2 Multi-component (Lossless Only) *
34	JPEG 2000 Part 2 Multi-component (Lossless or Lossy) *
35	JPIP Referenced *
36	JPIP Referenced Deflate *

* *Transfer Syntax* will be accepted, if the unprocessable *Transfer Syntaxes* are enabled for DICOM Service.

4.2.2.4.1.3.4 Response Status

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

Table 4-22

RESPONSE STATUS FOR STORAGE-SCP AND RECEIVE STORAGE REQUEST

Service Status	Further Meaning	Status Codes	Reason
Failure	Out of Resources	A7xx	Error message is output to the log file
		A701	Unable to store the DICOM file as it is
		A702	Database error
		A703	Failure before the importing the DICOM file
		A704	Failure after importing the DICOM

			file
		A705	Reject duplicate image
		A706	Failure to acquire study lock
	SOP Class is not Supported	A8xx	SOP Class is not supported
	Data Set does not match SOP Class	A900	Request and data set do not match on SOP Class
	Data Set does not match SOP Instance UID	A901	Request and data set do not match on SOP Instance UID
	Cannot understand	C0xx	Cannot understand data set
		C001	File cannot be read in DICOM format
		C002	DICOM file is missing required field
Warning	Coercion of Data Elements	B000	Duplicate image is overwritten with warning
	Elements Discarded	B006	Duplicate image is ignored with warning
Success	Store is complete	0000	Current store is terminated; remaining stores continue

4.2.3 Find

4.2.3.1 SOP Classes

FIND-SCU and FIND-SCP provides standard conformance to the following *SOP Class(es)*:

**Table 4-23
SOP CLASS(ES) SUPPORTED BY FIND**

SOP Class Name	SOP Class UID	SCU	SCP
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Yes	Yes
Study Root	1.2.840.10008.5.1.4.1.2.2.1	Yes	Yes

Query/Retrieve Information Model - FIND			
Patient/Study Only Query/Retrieve Information Model - FIND (Retired)	1.2.840.10008.5.1.4.1.2.3.1	No	Yes

4.2.3.2 Association Policies

4.2.3.2.1 General

**Table 4-24
DICOM APPLICATION CONTEXT**

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

**Table 4-25
MAXIMUM PDU SIZE RECEIVED FOR FIND**

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.3.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

**Table 4-26
NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR FIND**

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

**Table 4-27
NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR FIND**

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.3.2.3 Asynchronous Nature

FIND will only allow a single outstanding operation on an *Association*. Therefore, FIND will not perform asynchronous operations window *Negotiation*.

**Table 4-28
ASYNCHRONOUS NATURE FOR FIND**

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

4.2.3.2.4 Implementation Identifying Information

Table 4-29

DICOM IMPLEMENTATION CLASS AND VERSION FOR FIND

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.3.3 Association Initiation Policy

FIND-SCU attempts to initiate a new *Association* for each query. If the query fails, no retry will be performed.

4.2.3.3.1 Activity – Send Find Request

4.2.3.3.1.1 Description and Sequencing of Activities

FIND-SCU can be initiated by the user performing a remote query from the Administration Web Interface. The query can be performed on different levels in the hierarchy, depending on what object the user chooses to query. FIND-SCU also can be automatically initiated by the pre/post-fetching service, in order to find prior studies or series for particular patients.

Patient Root Query/Retrieve Information Model is used by DICOM Import Reconciliation, to get a list of patients from a remote AE. Study Root Query/Retrieve Information Model is used by all other general queries on study, series, and image level.

4.2.3.3.1.2 Proposed Presentation Contexts

Table 4-30

PROPOSED PRESENTATION CONTEXTS FOR FIND-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	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
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
		Explicit VR Little	1.2.840.10008.1.2.1	SCU	None

		Endian			
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

FIND-SCU proposes only one *Presentation Context* in each *Association* with one supported *SOP Class* and the *Transfer Syntaxes* listed above.

4.2.3.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

Relational queries are supported.

4.2.3.3.1.3 SOP Specific Conformance

4.2.3.3.1.3.1 SOP Specific Conformance to FIND SOP Class

FIND-SCU provides standard conformance to the supported FIND Service Class.

No CANCEL requests are ever issued.

A query can be initiated from any level given the appropriate criteria.

Requested return *Attributes* not returned by the FIND-SCP are ignored. Non-matching responses returned by the FIND-SCP due to unsupported matching keys are not filtered locally by the FIND-SCU and thus will still be presented in the query results. No attempt is made to filter out duplicate responses.

Specific Character Set will always be included in each query request. If present in the response, Specific Character Set will be used to identify character sets other than the default character set for application processing and display purpose. The character set to be used by FIND-SCU can be configured from the Administration Web Interface.

Table 4-31

PATIENT ROOT REQUEST IDENTIFIER FOR FIND-SCU

Name	Tag	Types of Matching
Patient Level		
Patient ID	(0010,0020)	S,W,U
Patient's Name	(0010,0010)	S,W,U
Patient's Birth Date	(0010,0030)	NONE
Patient's Sex	(0010,0040)	S,U
Specific Character Set	(0008,0005)	S,U

Table 4-32

STUDY ROOT REQUEST IDENTIFIER FOR FIND-SCU

Name	Tag	Types of Matching
Study Level		

Patient ID	(0010,0020)	S,W,U
Patient's Name	(0010,0010)	S,W,U
Patient's Birth Date	(0010,0030)	NONE
Patient's Sex	(0010,0040)	NONE
Study Instance UID	(0020,000D)	UNIQUE
Accession Number	(0008,0050)	S,W,U
Study Date	(0008,0020)	S,R,U
Study Time	(0008,0030)	NONE
Modalities In Study	(0008,0061)	S,U
Institution Name	(0008,0080)	S,W,U
Study ID	(0020,0010)	NONE
Study Description	(0008,1030)	S,W,U
Requested Procedure Description	(0032,1060)	NONE
Admitting Diagnoses Description	(0008,1080)	NONE
Referring Physician's Name	(0008,0090)	S,W,U
Name of Physicians Reading Study	(0008,1060)	S,W,U
Number of Study Related Series	(0020,1206)	NONE
Name of Study Related Instances	(0020,1208)	NONE
Retrieve AE Title	(0008,0054)	NONE
Instance Availability	(0008,0056)	NONE
Series Level		
Patient ID	(0010,0020)	S,W,U
Patient's Name	(0010,0010)	S,W,U
Study Description	(0008,1030)	S,W,U
Study Date	(0008,0020)	S,R,U
Accession Number	(0008,0050)	S,W,U
Referring Physician's Name	(0008,0090)	S,W,U
Name of Physicians Reading Study	(0008,1060)	S,W,U
Institution Name	(0008,0080)	S,W,U
Study Instance UID	(0020,000D)	S,U
Series Instance UID	(0020,000E)	UNIQUE
Series Date	(0008,0021)	NONE
Series Time	(0008,0031)	NONE
Modality	(0008,0060)	S,U

Series Number	(0020,0011)	NONE
Series Description	(0008,103E)	S,W,U
Protocol Name	(0018,1030)	NONE
Body Part Examined	(0018,0015)	S,W,U
Operator's Name	(0008,1070)	NONE
Performing Physician's Name	(0008,1050)	NONE
Performed Procedure Step Description	(0040,0254)	NONE
Performed Procedure Step ID	(0040,0253)	NONE
Performed Procedure Step Start Date	(0040,0244)	NONE
Performed Procedure Step Start Time	(0040,0245)	NONE
Number of Series Related Instances	(0020,1209)	NONE
Image Level		
Series Instance UID	(0020,000E)	S,U
SOP Instance UID	(0008,0018)	UNIQUE
SOP Class UID	(0008,0016)	NONE
Acquisition Date Time	(0008,002A)	NONE
Instance Number	(0020,0013)	NONE
Image Comments	(0020,4000)	NONE
Rows	(0028,0010)	NONE
Columns	(0028,0011)	NONE
Bits Allocated	(0028,0100)	NONE
Number of Frames	(0028,0008)	NONE
Content Date	(0008,0023)	NONE
Content Time	(0008,0033)	NONE
Content Label	(0070,0080)	NONE
Content Description	(0070,0081)	NONE
Content Creator's Name	(0070,0084)	NONE
Presentation Creation Date	(0070,0082)	NONE
Presentation Creation Time	(0070,0083)	NONE
Observation Date Time	(0040,A032)	NONE
Completion Flag	(0040,A491)	NONE
Verification Flag	(0040,A493)	NONE
Common to all query levels		

Specific Character Set	(0008,0005)	S,U
------------------------	-------------	-----

The types of matching supported by the FIND-SCU. An "S" indicates the identifier *Attribute* uses Single Value Matching, an "R" indicates Range Matching, a "W" indicates Wildcard Matching, a "U" indicates Universal Matching. "NONE" indicates that no matching is supported, but that values for this element are requested to be returned (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.

The identifiers listed for each level are not necessarily all included for all the Study Root Query/Retrieve Information Model C-FIND requests. Different applications may use different subsets to issue the C-FIND requests, depending on what *Attributes* that they are interested in.

4.2.3.3.1.3.2 Presentation Context Acceptance Criterion

FIND-SCU does not accept *Association*.

4.2.3.3.1.3.3 Transfer Syntax Selection Policies

As FIND-SCU only proposes one *Presentation Context* for a supported *SOP Class*, it will use any of the *Transfer Syntaxes* accepted by the remote FIND-SCP.

4.2.3.4 Association Acceptance Policy

4.2.3.4.1 Activity – Receive FIND Request

4.2.3.4.1.1 Description and Sequencing of Activities

When FIND-SCP is dispatched upon FIND requests, it responds to the FIND-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted read permission to access the Called AE Title, the *Association* will be rejected too.

4.2.3.4.1.2 Accepted Presentation Contexts

Table 4-33

ACCEPTABLE PRESENTATION CONTEXTS FOR FIND-SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4-23	See Table 4-23	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little	1.2.840.10008.1.2.1		

		Endian			
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

4.2.3.4.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.3.4.1.3 SOP Specific Conformance

4.2.3.4.1.3.1 SOP Specific Conformance to FIND SOP Class

FIND-SCP provides standard conformance to the supported FIND Service Class.

Unsupported matching keys are ignored by FIND-SCP, and a warning status will be returned in the response. Unsupported return keys are returned as empty by FIND-SCP.

Character set conversion may be performed by FIND-SCP to provide responses as specified by the Specific Character Set in the C-FIND request. If the character set conversion is not possible on certain results, these results will be filtered from the C-FIND responses, while other results will still be returned normally in the requested character set. If the results returned by FIND-SCP is incomplete, a failure status will be returned in the response at the end.

There is no limitation on the number of FIND responses that the FIND-SCP can return.

Table 4-34

PATIENT ROOT RESPONSE IDENTIFIER FOR FIND-SCP

Name	Tag	Types of Matching
Patient ID	(0010,0020)	S,W
Issuer of Patient ID	(0010,0021)	S,W
Patient's Name	(0010,0010)	S,W
Patient's Birth Date	(0010,0030)	S,R
Patient's Birth Time	(0010,0032)	S,R
Patient's Sex	(0010,0040)	S,W
Other Patient IDs	(0010,1000)	S,W
Other Patient Names	(0010,1001)	S,W
Medical Alerts	(0010,2000)	S,W
Allergies	(0010,2110)	S,W
Patient Telephone Numbers	(0010,2154)	S,W
Ethnic Group	(0010,2160)	S,W
Patient Species Description	(0010,2201)	S,W
Patient Breed Description	(0010,2292)	S,W

Responsible Person	(0010,2297)	S,W
Number of Patient Related Studies	(0020,1200)	NONE
Number of Patient Related Series	(0020,1202)	NONE
Number of Patient Related Instances	(0020,1204)	NONE
Specific Character Set	(0008,0005)	S

Table 4-35
STUDY ROOT RESPONSE IDENTIFIER FOR FIND-SCP

Name	Tag	Types of Matching
Patient Level		
Patient ID	(0010,0020)	S,W
Issuer of Patient ID	(0010,0021)	S,W
Patient's Name	(0010,0010)	S,W
Patient's Birth Date	(0010,0030)	S,R
Patient's Birth Time	(0010,0032)	S,R
Patient's Sex	(0010,0040)	S,W
Other Patient IDs	(0010,1000)	S,W
Other Patient Names	(0010,1001)	S,W
Medical Alerts	(0010,2000)	S,W
Allergies	(0010,2110)	S,W
Patient Telephone Numbers	(0010,2154)	S,W
Ethnic Group	(0010,2160)	S,W
Patient Species Description	(0010,2201)	S,W
Patient Breed Description	(0010,2292)	S,W
Responsible Person	(0010,2297)	S,W
Number of Patient Related Studies	(0020,1200)	NONE
Number of Patient Related Series	(0020,1202)	NONE
Number of Patient Related Instances	(0020,1204)	NONE
Study Level		
Study Instance UID	(0020,000D)	S,L
Accession Number	(0008,0050)	S,W
Study Date	(0008,0020)	S,R

Study Time	(0008,0030)	S,R
Modalities In Study	(0008,0061)	NONE
Institution Name	(0008,0080)	S,W
Study ID	(0020,0010)	S
Study Description	(0008,1030)	S,W
Requested Procedure Description	(0032,1060)	S,W
Admitting Diagnoses Description	(0008,1080)	S,W
Referring Physician's Name	(0008,0090)	S,W
Name of Physicians Reading Study	(0008,1060)	S,W
Number of Study Related Series	(0020,1206)	NONE
Name of Study Related Instances	(0020,1208)	NONE
Procedure Code Sequence > (All)	(0008,1032)	Q
Patient Age	(0010,1010)	S
Patient Size	(0010,1020)	S
Patient Weight	(0010,1030)	S
Occupation	(0010,2180)	S,W
Instance Availability	(0008,0056)	NONE
Series Level		
Series Instance UID	(0020,000E)	S,L
Series Date	(0008,0021)	S,R
Series Time	(0008,0031)	S,R
Modality	(0008,0060)	S
Series Number	(0020,0011)	S
Series Description	(0008,103E)	S,W
Protocol Name	(0018,1030)	S,W
Body Part Examined	(0018,0015)	S,W
Operator's Name	(0008,1070)	S,W
Performing Physician's Name	(0008,1050)	S,W
Performed Procedure Step Description	(0040,0254)	S,W
Performed Procedure Step ID	(0040,0253)	S
Performed Procedure Step Start Date	(0040,0244)	S,R
Performed Procedure Step Start Time	(0040,0245)	S,R

Number of Series Related Instances	(0020,1209)	NONE
Request Attributes Sequence > (All)	(0040,0275)	Q
Image Level		
SOP Instance UID	(0008,0018)	S,L
SOP Class UID	(0008,0016)	S,L
Image Type	(0008,0008)	S,W
Acquisition Date Time	(0008,002A)	S,R
Instance Number	(0020,0013)	S
Image Comments	(0020,4000)	S,W
Rows	(0028,0010)	S
Columns	(0028,0011)	S
Bits Allocated	(0028,0100)	S
Number of Frames	(0028,0008)	S
Content Date	(0008,0023)	S,R
Content Time	(0008,0033)	S,R
Content Label	(0070,0080)	S,W
Content Description	(0070,0081)	S,W
Content Creator's Name	(0070,0084)	S,W
Presentation Creation Date	(0070,0082)	S,R
Presentation Creation Time	(0070,0083)	S,R
Observation Date Time	(0040,A032)	S,R
Completion Flag	(0040,A491)	S
Verification Flag	(0040,A493)	S
Referenced Series Sequence > (All)	(0008,1115)	Q
Referenced Image Sequence > (All)	(0008,1140)	Q
Concept Name Code Sequence > (All)	(0040,A043)	Q
Verifying Observer Sequence > (All)	(0040,A073)	Q
Referenced Request Sequence > (All)	(0040,A370)	Q
Content Template Sequence > (All)	(0040,A504)	Q
Common to all query levels		

Specific Character Set	(0008,0005)	S
------------------------	-------------	---

The types of matching supported by the FIND-SCP. An "S" indicates the identifier *Attribute* uses Single Value Matching, an "R" indicates Range Matching, a "W" indicates Wildcard Matching, an "L" indicates List of UID Matching. "NONE" indicates that no matching is supported, but that values for this element are to be returned (i.e. Universal Matching).

4.2.3.4.1.3.2 Presentation Context Acceptance Criterion

FIND-SCP will always accept any *Presentation Context* for the FIND *SOP Class* with the supported *Transfer Syntax*. 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*.

4.2.3.4.1.3.3 Transfer Syntax Selection Policies

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

Table 4-36

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR FIND-SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

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 priority for selecting a *Transfer Syntax* for each.

4.2.3.4.1.3.4 Response Status

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

Table 4-37

RESPONSE STATUS FOR FIND-SCP AND RECEIVE FIND REQUEST

Service Status	Further Meaning	Status Codes	Reason
Failure	Out of Resources	A700	Error message is output to the log file
	SOP Class is not Supported	A800	SOP Class is not supported
	Identifier does not	A900	SOP Class and

	match SOP Class		Query/Retrieve level do not match
	Unable to Process	Cxxx	Unable to process request
		C001	Unable to read request data set
		C002	Database error
		C003	Failure before executing the query
		C004	Failure after executing the query
		C005	Missing required field in the request
		C006	Unable to send one or more responses
Warning		Unsupported Optional Keys	FF01
Pending	Matches are continuing - Current Match is supplied	FF00	Any Optional Keys were supported in the same manner as Required Keys
Cancel	Cancel	FE00	Matching terminated due to cancel request
Success	Matching is complete - No final identifier is supplied	0000	Current query is terminated; remaining queries continue

4.2.4 Move

4.2.4.1 SOP Classes

MOVE-SCU and MOVE-SCP provides standard conformance to the following *SOP Class(es)*:

**Table 4-38
SOP CLASS(ES) SUPPORTED BY MOVE**

SOP Class Name	SOP Class UID	SCU	SCP
Patient Root Query/Retrieve Information Model -	1.2.840.10008.5.1.4.1.2.1.2	No	Yes

MOVE			
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Yes	Yes
Patient/Study Only Query/Retrieve Information Model - MOVE (Retired)	1.2.840.10008.5.1.4.1.2.3.2	No	Yes

4.2.4.2 Association Policies

4.2.4.2.1 General

Table 4-39

DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Table 4-40

MAXIMUM PDU SIZE RECEIVED FOR MOVE

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.4.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-41

NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR MOVE

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

Table 4-42

NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR MOVE

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.4.2.3 Asynchronous Nature

MOVE will only allow a single outstanding operation on an *Association*. Therefore, MOVE will not perform asynchronous operations window *Negotiation*.

Table 4-43

ASYNCHRONOUS NATURE FOR MOVE

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

4.2.4.2.4 Implementation Identifying Information

Table 4-44

DICOM IMPLEMENTATION CLASS AND VERSION FOR MOVE

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.4.3 Association Initiation Policy

MOVE-SCU attempts to initiate a new *Association* for each retrieve request.

4.2.4.3.1 Activity – Send Move Request

4.2.4.3.1.1 Description and Sequencing of Activities

MOVE-SCU can be initiated by the user performing a retrieve from the Administration Web Interface. The retrieval can be executed on different levels in the hierarchy, depending on what object the user chooses to retrieve. MOVE-SCU also can be automatically initiated by the pre/post-fetching service, in order to forward prior studies or series for particular patients.

4.2.4.3.1.2 Proposed Presentation Contexts

Table 4-45

PROPOSED PRESENTATION CONTEXTS FOR MOVE-SCU

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

4.2.4.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

Relational retrievals are supported.

4.2.4.3.1.3 SOP Specific Conformance

4.2.4.3.1.3.1 SOP Specific Conformance to MOVE SOP Class

MOVE-SCU provides standard conformance to the supported MOVE Service Class. Only Study Root Query/Retrieve Information Model is supported by MOVE-SCU. A retrieval will be performed at the STUDY, SERIES or IMAGE level depending on what level of entity has been selected if the retrieval is initiated by the user, or what pre/post-fetching policies has been configured if the retrieval is initiated by these policies.

No CANCEL requests are ever issued.

The instances are retrieved to a local or remote move destination by specifying the destination as the AE Title of the STORAGE-SCP AE. This implies that the remote MOVE-SCP must be pre-configured to determine the presentation address corresponding to the STORAGE-SCP AE, and the STORAGE-SCP AE must accept storage requests addressed to it from the MOVE-SCP.

Table 4-46
STUDY ROOT REQUEST IDENTIFIER FOR MOVE-SCU

Name	Tag	Unique, Matching or Return Key
Study Level		
Study Instance UID	(0020,000D)	U
Series Level		
Series Instance UID	(0020,000E)	U
Image Level		
SOP Instance UID	(0008,0018)	U

4.2.4.3.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCU does not accept *Association*.

4.2.4.3.1.3.3 Transfer Syntax Selection Policies

As MOVE-SCU only proposes one *Presentation Context* for the supported *SOP Class*, it will use any of the *Transfer Syntaxes* accepted by the remote MOVE-SCP.

4.2.4.3.1.3.4 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* must be considered.

MOVE-SCU is completely independent of whatever activities are taking place in relation to the STORAGE-SCP AE that is receiving the retrieved instances. The only status update of the move operation is from the response status returned by MOVE-SCP. There is no attempt by MOVE-SCU to confirm that instances have actually been successfully received or stored.

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.

4.2.4.4 Association Acceptance Policy

4.2.4.4.1 Activity – Receive MOVE Request

4.2.4.4.1.1 Description and Sequencing of Activities

When MOVE-SCP is dispatched upon MOVE requests, it responds to the MOVE-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted read permission to access the Called AE Title, the *Association* will be rejected too.

4.2.4.4.1.2 Accepted Presentation Contexts

Table 4-47

ACCEPTABLE PRESENTATION CONTEXTS FOR MOVE-SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4-38	See Table 4-38	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

4.2.4.4.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.4.4.1.3 SOP Specific Conformance

4.2.4.4.1.3.1 SOP Specific Conformance to MOVE SOP Class

MOVE-SCP provides standard conformance to the supported MOVE Service Class.

A find will be performed to locate the requested entity on the MOVE-SCP AE. If such entity cannot be found, the move operation will fail.

The move destination must be pre-configured as a local or remote AE, so that its presentation address can be determined by the MOVE-SCP to issue the C-STORE requests.

Table 4-48

PATIENT ROOT RESPONSE IDENTIFIER FOR MOVE-SCP

Name	Tag	Unique, Matching or Return Key
Patient Level		
Patient ID	(0010,0020)	U

Table 4-49

STUDY, PATIENT/STUDY ROOT RESPONSE IDENTIFIER FOR MOVE-SCP

Name	Tag	Unique, Matching or Return Key
Study Level		
Study Instance UID	(0020,000D)	U
Series Level		
Series Instance UID	(0020,000E)	U
Image Level		
SOP Instance UID	(0008,0018)	U

4.2.4.4.1.3.2 Presentation Context Acceptance Criterion

MOVE-SCP will always accept any *Presentation Context* for the MOVE SOP Class with the supported *Transfer Syntax*. 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

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

Table 4-50

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR MOVE-SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

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 priority for selecting a *Transfer Syntax* for each.

4.2.4.4.1.3.4 Sub-operation dependent behavior

Once the sub-association is successfully established from the MOVE-SCP to the STORAGE-SCP AE as specified by the move destination in C-MOVE request, the MOVE-SCP will play the role of STORAGE-SCU to send the storage request, based on the standard conformance to the supported STORAGE Service Class.

After receiving each C-STORE response from the STORAGE-SCP, a C-MOVE response is sent the MOVE-SCP to the MOVE-SCU, to update the status of the move, as well as the sub operations, including the Number of Remaining Sub Operations, Completed Sub Operations, and Failed Sub Operations. These numbers represent the real time progress of C-STORE, and can be trusted by the MOVE-SCU.

4.2.4.4.1.3.5 Response Status

MOVE-SCP will behave as described in the table below when generating the MOVE response command message.

Table 4-51

RESPONSE STATUS FOR MOVE-SCP AND RECEIVE MOVE REQUEST

Service Status	Further Meaning	Status Codes	Reason	
Error	Out of Resources	A701	Unable to locate requested entity	
	Out of Resources Sub Operations	A702	Failure in C-STORE sub-association	
	SOP Class is not Supported	A800	SOP Class is not supported	
	Move Destination Unknown	A801	Destination AE is not configured	
	Identifier does not match SOP Class	A900	SOP Class and Query/Retrieve level do not match	
	Unable to Process		Cxxx	Unable to process request
			C001	Unable to read request data set
			C002	Failure before the retrieval
			C003	Failure after the retrieval

		C004	Missing required field in the request
Warning	Sub Operations Complete One or More Failures	B000	One or more failures in C-STORE sub operations.
Pending	Pending	FF00	Results to be continued
Cancel	Cancel	FE00	Sub Operations Terminated Due to Cancel Indication
Success		0000	

4.2.5 Modality Worklist Find

4.2.5.1 SOP Classes

MWL-FIND-SCU and MWL-FIND-SCP provides standard conformance to the following *SOP Class*:

**Table 4-52
SOP CLASS SUPPORTED BY MWL FIND**

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	Yes

4.2.5.2 Association Policies

4.2.5.2.1 General

**Table 4-53
DICOM APPLICATION CONTEXT**

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

**Table 4-54
MAXIMUM PDU SIZE RECEIVED FOR MWL FIND**

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.5.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-55

NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR MWL FIND

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

Table 4-56

NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR MWL FIND

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.5.2.3 Asynchronous Nature

MWL FIND will only allow a single outstanding operation on an *Association*. Therefore, MWL FIND will not perform asynchronous operations window *Negotiation*.

Table 4-57

ASYNCHRONOUS NATURE FOR MWL FIND

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

4.2.5.2.4 Implementation Identifying Information

Table 4-58

DICOM IMPLEMENTATION CLASS AND VERSION FOR MWL FIND

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.5.3 Association Initiation Policy

MWL-FIND-SCU attempts to initiate a new *Association* for each query.

4.2.5.3.1 Activity – Send MWL Find Request

4.2.5.3.1.1 Description and Sequencing of Activities

MWL-FIND-SCU is initiated by the pre/post-fetching service, to track scheduled exams in a certain time frame using criteria specified by the pre/post-fetching policies.

4.2.5.3.1.2 Proposed Presentation Contexts

Table 4-59

PROPOSED PRESENTATION CONTEXTS FOR MWL-FIND-SCU

Presentation Context Table			
Abstract Syntax	Transfer Syntax	Role	Extended

Name	UID	Name	UID		Negotiation
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	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

MWL-FIND-SCU proposes only one *Presentation Context* in each *Association* with one supported *SOP Class* and two native *Transfer Syntaxes*.

4.2.5.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.5.3.1.3 SOP Specific Conformance

4.2.5.3.1.3.1 SOP Specific Conformance to MWL FIND SOP Class

MWL-FIND-SCU provides standard conformance to the supported MWL FIND Service Class.

No CANCEL requests are ever issued.

Requested *Attributes* not returned by the MWL-FIND-SCP are ignored. Non-matching responses returned by the MWL-FIND-SCP due to unsupported matching keys are filtered locally by the MWL-FIND-SCU. No attempt is made to filter out duplicate responses.

Specific Character Set will always be included in each query request. If present in the response, Specific Character Set will be used to identify character sets other than the default character set for application processing. The character set to be used by MWL-FIND-SCU can be configured from the Administration Web Interface.

Table 4-60

REQUEST IDENTIFIER FOR MWL-FIND-SCU

Name	Tag	Types of Matching
Patient ID	(0010,0020)	NONE
Patient's Name	(0010,0010)	NONE
Accession Number	(0008,0050)	NONE
Institution Name	(0008,0080)	NONE
Referring Physician's Name	(0008,0090)	NONE
Referenced Study Sequence	(0008,1110)	NONE
Referenced Patient Sequence	(0008,1120)	NONE
Study Instance UID	(0020,000D)	NONE
Requested Procedure Description	(0032,1060)	NONE

Requested Procedure Code Sequence	(0032,1064)	NONE
Admission ID	(0038,0010)	NONE
Scheduled Procedure Step Sequence	(0040,0100)	Q
> Modality	(0008,0060)	S,U
> Scheduled Station AE Title	(0040,0001)	S,U
> Scheduled Procedure Step Start Date	(0040,0002)	R,U
> Scheduled Procedure Step Start Time	(0040,0003)	R,U
> Scheduled Procedure Step Description	(0040,0007)	NONE
Requested Procedure ID	(0040,1001)	NONE
Reason For The Requested Procedure	(0040,1002)	NONE
Requested Procedure Priority	(0040,1003)	NONE
Specific Character Set	(0008,0005)	S,U

The types of matching supported by the MWL-FIND-SCU. An "S" indicates the identifier *Attribute* uses Single Value Matching, an "R" indicates Range Matching, a "U" indicates Universal Matching, a "Q" indicates Sequence Matching. "NONE" indicates that no matching is supported, but that values for this element are requested to be returned (i.e. Universal Matching).

4.2.5.3.1.3.2 Presentation Context Acceptance Criterion

MWL-FIND-SCU does not accept *Association*.

4.2.5.3.1.3.3 Transfer Syntax Selection Policies

As MWL-FIND-SCU only proposes one *Presentation Context* for the supported *SOP Class*, it will use any of the *Transfer Syntaxes* accepted by the remote MWL-FIND-SCP.

4.2.5.4 Association Acceptance Policy

4.2.5.4.1 Activity – Receive MWL FIND Request

4.2.5.4.1.1 Description and Sequencing of Activities

When MWL-FIND-SCP is dispatched upon MWL FIND requests, it responds to the MWL-FIND-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in

promiscuous mode, or the Calling AE Title is not granted read permission to access the Called AE Title, the *Association* will be rejected too.

4.2.5.4.1.2 Accepted Presentation Contexts

Table 4-61

ACCEPTABLE PRESENTATION CONTEXTS FOR MWL-FIND-SCP

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

4.2.5.4.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.5.4.1.3 SOP Specific Conformance

4.2.5.4.1.3.1 SOP Specific Conformance to MWL FIND SOP Class

MWL-FIND-SCP provides standard conformance to the supported MWL FIND Service Class.

Unsupported matching keys are ignored by MWL-FIND-SCP. Unsupported return keys are not returned by MWL-FIND-SCP.

Character set conversion may be performed by MWL-FIND-SCP to provide responses as specified by the Specific Character Set in the MWL FIND request. If the character set conversion is not possible on certain results, these results will be filtered from the MWL FIND responses, while other results will still be returned normally in the requested character set.

There is no limitation on the number of responses that the MWL-FIND-SCP can return.

Table 4-62

RESPONSE IDENTIFIER FOR MWL-FIND-SCP

Name	Tag	Types of Matching
Patient ID	(0010,0020)	S
Patient's Name	(0010,0010)	S,W

Patient's Birth Date	(0010,0030)	NONE
Patient's Sex	(0010,0040)	NONE
Other Patient IDs	(0010,1000)	NONE
Confidentiality Constraint On Patient Data Description	(0040,3001)	NONE
Patient State	(0038,0500)	NONE
Pregnancy Status	(0010,21C0)	NONE
Medical Alerts	(0010,2000)	NONE
Allergies	(0010,2110)	NONE
Patient's Weight	(0010,1030)	NONE
Special Needs	(0038,0050)	NONE
Accession Number	(0008,0050)	S
Admission ID	(0038,0010)	NONE
Referring Physician's Name	(0008,0090)	S,W
Requesting Physician	(0032,1032)	NONE
Current Patient Location	(0038,0300)	NONE
Institution Name	(0008,0080)	NONE
Requested Procedure ID	(0040,1001)	S
Reason For The Requested Procedure	(0040,1002)	NONE
Requested Procedure Description	(0032,1060)	NONE
Requested Procedure Priority	(0040,1003)	NONE
Requested Procedure Code Sequence	(0032,1064)	NONE
> Code Value	(0008,0100)	NONE
> Coding Scheme Designator	(0008,0102)	NONE
> Coding Scheme Version	(0008,0103)	NONE
> Code Meaning	(0008,0104)	NONE
Study Instance UID	(0020,000D)	NONE
Referenced Study Sequence	(0008,1110)	NONE
> Referenced SOP Class UID	(0008,1150)	NONE
> Referenced SOP Instance UID	(0008,1155)	NONE
Referenced Patient Sequence	(0008,1120)	NONE
> Referenced SOP Class UID	(0008,1150)	NONE
> Referenced SOP Instance UID	(0008,1155)	NONE
Scheduled Procedure Step Sequence	(0040,0100)	Q

> Scheduled Station AE Title	(0040,0001)	S
> Scheduled Station Name	(0040,0010)	NONE
> Modality	(0008,0060)	S
> Scheduled Performing Physician's Name	(0040,0006)	NONE
> Scheduled Procedure Step Start Date	(0040,0002)	S,R
> Scheduled Procedure Step Start Time	(0040,0003)	S,R
> Scheduled Procedure Step ID	(0040,0009)	NONE
> Scheduled Procedure Step Description	(0040,0007)	NONE
> Scheduled Procedure Step Location	(0040,0011)	NONE
> Scheduled Protocol Code Sequence	(0040,0008)	NONE
>> Code Value	(0008,0100)	NONE
>> Coding Scheme Designator	(0008,0102)	NONE
>> Coding Scheme Version	(0008,0103)	NONE
>> Code Meaning	(0008,0104)	NONE
Specific Character Set	(0008,0005)	S

The types of matching supported by the MWL-FIND-SCP. An "S" indicates the identifier *Attribute* uses Single Value Matching, an "R" indicates Range Matching, a "W" indicates Wildcard Matching, a "Q" indicates Sequence Matching. "NONE" indicates that no matching is supported, but that values for this element are to be returned (i.e. Universal Matching).

4.2.5.4.1.3.2 Presentation Context Acceptance Criterion

MWL-FIND-SCP will always accept any *Presentation Context* for the MWL FIND *SOP Class* with the supported *Transfer Syntax*. 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*.

4.2.5.4.1.3.3 Transfer Syntax Selection Policies

MWL-FIND-SCP prefers explicit *Transfer Syntax*. If offered a choice of *Transfer Syntaxes* in a *Presentation Context*, it will apply the following priority to the choice of *Transfer Syntax*:

Table 4-63

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR MWL-FIND-

SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

MWL-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 priority for selecting a *Transfer Syntax* for each.

4.2.5.4.1.3.4 Response Status

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

Table 4-64

RESPONSE STATUS FOR MWL-FIND-SCP AND RECEIVE MWL FIND REQUEST

Service Status	Further Meaning	Status Codes	Reason	
Failure	Out of Resources	A700	Error message is output to the log file	
	SOP Class is not Supported	A800	SOP Class is not supported	
	Identifier does not match SOP Class	A900	SOP Class and Query/Retrieve level do not match	
	Unable to Process		Cxxx	Unable to process request
			C001	Unable to read request data set
			C002	Database error
			C003	Failure before executing the query
			C004	Failure after executing the query
C005			Missing required field in the request	
C006	Unable to send one or more responses			
Warning	Unsupported Optional Keys	FF01	Unsupported optional keys in the request	

			data set
Pending	Matches are continuing - Current Match is supplied	FF00	Any Optional Keys were supported in the same manner as Required Keys
Cancel	Cancel	FE00	Matching terminated due to cancel request
Success	Matching is complete - No final identifier is supplied	0000	Current query is terminated; remaining queries continue

4.2.6 Modality Performed Procedure Step

4.2.6.1 SOP Classes

MPPS-SCP provides standard conformance to the following *SOP Class*:

Table 4-65

SOP CLASS SUPPORTED BY MPPS

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	No	Yes

4.2.6.2 Association Policies

4.2.6.2.1 General

Table 4-66

DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Table 4-67

MAXIMUM PDU SIZE RECEIVED FOR MPPS

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.6.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-68**NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR MPPS**

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.6.2.3 Asynchronous Nature

MPPS will only allow a single outstanding operation on an *Association*. Therefore, MPPS will not perform asynchronous operations window *Negotiation*.

Table 4-69**ASYNCHRONOUS NATURE FOR MPPS**

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

4.2.6.2.4 Implementation Identifying Information**Table 4-70****DICOM IMPLEMENTATION CLASS AND VERSION FOR MPPS**

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.6.3 Association Acceptance Policy**4.2.6.3.1 Activity – Receive MPPS Request****4.2.6.3.1.1 Description and Sequencing of Activities**

When MPPS-SCP is dispatched upon MPPS requests, it responds to the MPPS-SCU. If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted permission to access the Called AE Title, the *Association* will be rejected too.

4.2.6.3.1.2 Accepted Presentation Contexts**Table 4-71****ACCEPTABLE PRESENTATION CONTEXTS FOR MPPS**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

SOP Class	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

4.2.6.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.6.3.1.3 SOP Specific Conformance

4.2.6.3.1.3.1 SOP Specific Conformance to MPPS SOP Class

MPPS-SCP provides standard conformance to the supported MPPS Service Class.

MPPS-SCP uses N-CREATE and N-SET to get the Performed Procedure Step notifications. The Performed Procedure Step contains information about its state. MPPS-SCP uses this state to update the corresponding procedure status for the workflow management application.

The following tables contain the identifiers processed by the MPPS-SCP for N-CREATE and N-SET Services.

**Table 4-72
IDENTIFIER FOR MPPS N-CREATE**

Name	Tag	Usage
SOP Instance UID	(0008,0018)	M
Performed Procedure Step Status	(0040,0252)	M
Patient ID	(0010,0020)	M
Patient's Name	(0010,0010)	U
Patient's Birth Date	(0010,0030)	U
Patient's Sex	(0010,0040)	U
Performed Procedure Step ID	(0040,0253)	U
Performed Procedure Step Start Date	(0040,0244)	U
Performed Procedure Step Start Time	(0040,0245)	U
Performed Station AE Title	(0040,0241)	U
Modality	(0008,0060)	U
Performed Procedure Step Description	(0040,0254)	U
Performed Procedure Type Description	(0040,0255)	U
Procedure Code Sequence	(0008,1032)	U
> Code Value	(0008,0100)	U
> Coding Scheme Designator	(0008,0102)	U

> Coding Scheme Version	(0008,0103)	U
> Code Meaning	(0008,0104)	U
Scheduled Step Attributes Sequence	(0040,0270)	U
> Study Instance UID	(0020,000D)	U
> Accession Number	(0008,0050)	U
> Requested Procedure ID	(0040,1001)	U
> Scheduled Procedure Step ID	(0040,0009)	U
> Requested Procedure Description	(0032,1060)	U
> Scheduled Procedure Step Description	(0040,0007)	U
> Scheduled Protocol Code Sequence	(0040,0008)	U
>> Code Value	(0008,0100)	U
>> Coding Scheme Designator	(0008,0102)	U
>> Coding Scheme Version	(0008,0103)	U
>> Code Meaning	(0008,0104)	U

Table 4-73
IDENTIFIER FOR MPPS N-SET

Name	Tag	Usage
SOP Instance UID	(0008,0018)	M
Performed Procedure Step Status	(0040,0252)	M
Performed Procedure Step ID	(0040,0253)	U
Performed Procedure Step End Date	(0040,0250)	U
Performed Procedure Step End Time	(0040,0251)	U
Performed Procedure Step Description	(0040,0254)	U
Performed Procedure Type Description	(0040,0255)	U
Scheduled Step Attributes Sequence	(0040,0270)	U
> Scheduled Procedure Step ID	(0040,0009)	U
> Accession Number	(0008,0050)	U

An “M” indicates the identifier *Attribute* is mandatory for the MPPS data set. A “U” indicates the identifier *Attribute* is optional for the MPPS data set.

The allowed values for Performed Procedure Step Status are “IN PROGRESS” for N-CREATE request, “DISCONTINUED” and “COMPLETED” for N-SET request.

If any mandatory identifier is missing, or the Performed Procedure Step Status *Attribute* contains invalid value, the MPPS-SCP will reject the request.

4.2.6.3.1.3.2 Presentation Context Acceptance Criterion

MPPS-SCP will always accept any *Presentation Context* for the MPPS *SOP Class* with the supported *Transfer Syntax*. 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*.

4.2.6.3.1.3.3 Transfer Syntax Selection Policies

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

Table 4-74

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR MPPS-SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

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

4.2.6.3.1.3.4 Response Status

MPPS-SCP will behave as described in the table below when generating the MPPS response command message.

Table 4-75

RESPONSE STATUS FOR MPPS-SCP AND RECEIVE MPPS REQUEST

Service Status	Further Meaning	Status Codes	Reason
Failure	Processing Failure	0110H	Error message is output to the log file
Success		0000	

4.2.7 Storage Commitment

4.2.7.1 SOP Classes

STORAGE-COMMITMENT-SCP provides standard conformance to the following *SOP Class*:

Table 4-76

SOP CLASS SUPPORTED BY STORAGE COMMITMENT

SOP Class Name	SOP Class UID	SCU	SCP
----------------	---------------	-----	-----

Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	No	Yes
---	----------------------	----	-----

4.2.7.2 Association Policies

4.2.7.2.1 General

Table 4-77

DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Table 4-78

MAXIMUM PDU SIZE RECEIVED FOR STORAGE COMMITMENT

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.7.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-79

NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR STORAGE COMMITMENT

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.7.2.3 Asynchronous Nature

Storage Commitment will only allow a single outstanding operation on an *Association*. Therefore, Storage Commitment will not perform asynchronous operations window *Negotiation*.

Table 4-80

ASYNCHRONOUS NATURE FOR STORAGE COMMITMENT

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

4.2.7.2.4 Implementation Identifying Information

Table 4-81

DICOM IMPLEMENTATION CLASS AND VERSION FOR STORAGE COMMITMENT

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.7.3 Association Acceptance Policy

4.2.7.3.1 Activity – Receive Storage Commitment Request

4.2.7.3.1.1 Description and Sequencing of Activities

When STORAGE-COMMITMENT-SCP is dispatched upon Storage Commitment requests, it responds to the STORAGE-COMMITMENT-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted permission to access the Called AE Title, the *Association* will be rejected too.

4.2.7.3.1.2 Accepted Presentation Contexts

Table 4-82

ACCEPTABLE PRESENTATION CONTEXTS FOR STORAGE COMMITMENT

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

4.2.7.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.7.3.1.3 SOP Specific Conformance

4.2.7.3.1.3.1 SOP Specific Conformance to Storage Commitment SOP Class

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

STORAGE-COMMITMENT-SCP accepts N-ACTION from STORAGE-COMMITMENT-SCU to get the list of instances to be verified. It initiates N-EVENT-REPORT-SCU and creates a separate *Association* to send commitment notifications of the requested instances to the corresponding N-EVENT-REPORT-SCP. The N-EVENT-

REPORT-SCP AE is determined from the Responding AE Title in the N-ACTION *Association*, or from the Calling AE Title if the Responding AE Title is not available. This N-EVENT-REPORT-SCP AE must be pre-configured as a remote AE, so that its presentation address can be determined by the N-EVENT-REPORT-SCU to issue the N-EVENT-REPORT requests.

The following tables contain the identifiers processed by the Storage Commitment for N-ACTION and N-EVENT-REPORT.

Table 4-83

IDENTIFIER FOR STORAGE COMMITMENT N-ACTION

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

Table 4-84

IDENTIFIER FOR STORAGE COMMITMENT N-EVENT-REPORT

Name	Tag
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)
> Failure Reason	(0008,1197)
Retrieve AE Title	(0008,0054)
Transaction UID	(0008,1195)

The Transaction ID in N-EVENT-REPORT must match the one in N-ACTION for the same Storage Commitment transaction.

4.2.7.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE-COMMITMENT-SCP will always accept any *Presentation Context* for the Storage Commitment *SOP Class* with the supported *Transfer Syntax*. 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*.

4.2.7.3.1.3.3 Transfer Syntax Selection Policies

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

Table 4-85

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR STORAGE-COMMITMENT-SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

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

4.2.7.3.1.3.4 Response Status

STORAGE-COMMITMENT-SCP will behave as described in the table below when generating the Storage Commitment response command message.

Table 4-86

RESPONSE STATUS FOR STORAGE-COMMITMENT-SCP AND RECEIVE STORAGE COMMITMENT REQUEST

Service Status	Further Meaning	Status Codes	Reason
Failure	Processing Failure	0110H	Error message is output to the log file
Success		0000	

4.2.8 Candelis Study Status Change

4.2.8.1 SOP Classes

CANDELIS-STUDY-STATUS-CHANGE-SCU and CANDELIS-STUDY-STATUS-CHANGE-SCP provides standard conformance to the following *SOP Class*:

Table 4-87

SOP CLASS SUPPORTED BY CANDELIS STUDY STATUS CHANGE

SOP Class Name	SOP Class UID	SCU	SCP
Candelis Study Status Change SOP Class	1.3.6.1.4.1.2820.228466.1	Yes	Yes

4.2.8.2 Association Policies

4.2.8.2.1 General

Table 4-88

DICOM APPLICATION CONTEXT

Application Context Name	1.2.840.10008.3.1.1.1
--------------------------	-----------------------

Table 4-89

MAXIMUM PDU SIZE RECEIVED FOR CANDELIS STUDY STATUS CHANGE

Maximum PDU size received	16384 Bytes (Configurable)
---------------------------	----------------------------

4.2.8.2.2 Number of Associations

The number of *Associations* are shared among all AE's equally on a first come first serve basis. There is a limitation on the overall number of *Associations* across all the AE's. But there is no constrain on any particular AE.

Table 4-90

NUMBER OF ASSOCIATIONS AS AN INITIATOR FOR CANDELIS STUDY STATUS CHANGE

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

Table 4-91

NUMBER OF ASSOCIATIONS AS AN ACCEPTOR FOR CANDELIS STUDY STATUS CHANGE

Maximum number of simultaneous associations	Default 16 (Configurable)
---	---------------------------

4.2.8.2.3 Asynchronous Nature

Candelis Study Status Change will only allow a single outstanding operation on an *Association*. Therefore, Candelis Study Status Change will not perform asynchronous operations window *Negotiation*.

Table 4-92

ASYNCHRONOUS NATURE FOR CANDELIS STUDY STATUS CHANGE

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

4.2.8.2.4 Implementation Identifying Information

Table 4-93

DICOM IMPLEMENTATION CLASS AND VERSION FOR CANDELIS STUDY STATUS CHANGE

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

4.2.8.3 Association Initiation Policy

CANDELIS-STUDY-STATUS-CHANGE-SCU attempts to initiate a new *Association* for each change update.

4.2.8.3.1 Activity – Send Candelis Study Status Change Request

4.2.8.3.1.1 Description and Sequencing of Activities

The study status is not a standard DICOM *Attribute*. It is maintained internally by the ImageGrid PACS for workflow management purpose. Between ImageGrid PACS systems, this state information can be exchanged with each other using the private Candelis Study Status Change *SOP Class* through the N-ACTION DIMSE transaction.

When a study is transferred by the routing service, this private *SOP Class* is always proposed along with other Storage *SOP Classes* in the *Presentation Context Negotiation*. If accepted, the study status data set will be sent on the same *Association* after all the C-STORE requests are finished.

If a replication routing policy is configured, the study status change transaction can also be initiated from any user triggered study status change event. Such study status change transaction does not involve any C-STORE operations of the study.

4.2.8.3.1.2 Proposed Presentation Contexts

Table 4-94

PROPOSED PRESENTATION CONTEXTS FOR CANDELIS-STUDY-STATUS-CHANGE-SCU

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Candelis Study Status Change SOP Class	1.3.6.1.4.1.2820.228466.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

CANDELIS-STUDY-STATUS-CHANGE-SCU proposes only one *Presentation Context* in each *Association* with one supported *SOP Class* and the listed *Transfer Syntaxes*.

4.2.8.3.1.2.1 Extended Negotiation

No extended *Negotiation* is performed.

4.2.8.3.1.3 SOP Specific Conformance

4.2.8.3.1.3.1 SOP Specific Conformance to Candelis Study Status Change SOP Class

CANDELIS-STUDY-STATUS-CHANGE-SCU provides conformance to the Candelis Study Status Change Service Class.

Table 4-95

REQUEST IDENTIFIER FOR CANDELIS-STUDY-STATUS-CHANGE-SCU

Name	Tag
Study Instance UID	(0020,000D)
Study Status ID (Retired)	(0032,000A)

The following table contains the allowed coded values in the Study Status ID *Attribute* and its meaning.

Table 4-96

CODED STUDY STATUS ID VALUES

Study Status ID Value	Meaning
0x00	Pending
0x01	Read
0x02	Dictated
0x04	Transcribed
0x08	Signed
0x10	Reported

4.2.8.3.1.3.2 Presentation Context Acceptance Criterion

CANDELIS-STUDY-STATUS-CHANGE-SCU does not accept *Association*.

4.2.8.3.1.3.3 Transfer Syntax Selection Policies

As CANDELIS-STUDY-STATUS-CHANGE-SCU only proposes one *Presentation Context* for the supported *SOP Class*, it will use any of the *Transfer Syntaxes* accepted by the remote CANDELIS-STUDY-STATUS-CHANGE-SCP.

4.2.8.4 Association Acceptance Policy

4.2.8.4.1 Activity – Receive Candelis Study Status Change Request

4.2.8.4.1.1 Description and Sequencing of Activities

When CANDELIS-STUDY-STATUS-CHANGE-SCP is dispatched upon Candelis Study Status Change requests, it updates the status of the requested study, and responds to the CANDELIS-STUDY-STATUS-CHANGE-SCU.

If the Called AE Title does not match any of the configured local AE Title, the *Association* will be rejected. If the Called AE Title is configured but not in promiscuous mode, or the Calling AE Title is not granted write permission to access the Called AE Title, the *Association* will be rejected too.

4.2.8.4.1.2 Accepted Presentation Contexts

Table 4-97

ACCEPTABLE PRESENTATION CONTEXTS FOR CANDELIS STUDY STATUS CHANGE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Candelis Study Status Change SOP Class	1.3.6.1.4.1.282 0.228466.1	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
		Explicit VR Big Endian	1.2.840.10008.1.2.2	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 Candelis Study Status Change SOP Class

CANDELIS-STUDY-STATUS-CHANGE-SCP provides conformance to the Candelis Study Status Change Service Class.

CANDELIS-STUDY-STATUS-CHANGE-SCP uses N-ACTION to get the status of the study from CANDELIS-STUDY-STATUS-CHANGE-SCU.

See Table 4-96 for allowed values of the study status and its meaning.

4.2.8.4.1.3.2 Presentation Context Acceptance Criterion

CANDELIS-STUDY-STATUS-CHANGE-SCP will always accept any *Presentation Context* for the Candelis Study Status Change *SOP Class* with the supported

Transfer Syntax. More than one proposed *Presentation Context* will be accepted for the same *Abstract Syntax* if the *Transfer Syntax* is supported, whether or not it is the same as another *Presentation Context*.

4.2.8.4.1.3.3 Transfer Syntax Selection Policies

CANDELIS-STUDY-STATUS-CHANGE-SCP prefers explicit *Transfer Syntax*. If offered a choice of *Transfer Syntaxes* in a *Presentation Context*, it will apply the following priority to the choice of *Transfer Syntax*:

Table 4-98

DEFAULT PRIORITY OF TRANSFER SYNTAX SELECTION FOR CANDELIS-STUDY-STATUS-CHANGE-SCP

Priority	Transfer Syntax Name
1	Explicit VR Little Endian
2	Explicit VR Big Endian
3	Implicit VR Little Endian

4.2.8.4.1.3.4 Response Status

CANDELIS-STUDY-STATUS-CHANGE-SCP will behave as described in the table below when generating the Candelis Study Status Change response command message.

Table 4-99

RESPONSE STATUS FOR CANDELIS-STUDY-STATUS-CHANGE-SCP AND RECEIVE CANDELIS STUDY STATUS CHANGE REQUEST

Service Status	Further Meaning	Status Codes	Reason
Failure	Processing Failure	0110H	Error message is output to the log file
Success		0000	

4.3 NETWORK INTERFACES

4.3.1 Physician Network Interface

ImageGrid PACS supports 10/100/1000 Mbit Ethernet.

4.3.2 Additional Protocols

ImageGrid PACS conforms to the System Management Profiles listed in the table below. All requested transactions for the listed profiles and actors are supported. Support for optional transactions are listed.

Table 4-100

SUPPORTED SYSTEM MANAGEMENT PROFILES

Profile Name	Actor	Protocol Used	Optional Transactions	Security Support
Network Address Management	DHCP Client	DHCP	N/A	
	DNS Client	DNS	N/A	
Time Synchronization	NTP Client	NTP	N/A	

4.3.2.1 DHCP

DHCP can be used to obtain TCP/IP network configuration information. The network parameters obtainable via DHCP are shown in the table below. The Default Value column of the table shows the default used if the DHCP server does not provide a value. If DHCP is not in use, TCP/IP network configuration information can be manually configured via the Administration Console or Web Interface.

Table 4-101

SUPPORTED DHCP PARAMETERS

DHCP Parameter	Default Value
IP Address	None
Hostname	Requested machine name
List of NTP servers	Empty list
List of DNS servers	Empty list
Routers	Empty list
Static routes	None
Domain name	None
Subnet mask	Derived from IP Address
Broadcast address	Derived from IP Address

Default router	None
Time offset	Timezone configuration
MTU	Network Hardware Dependent
Auto-IP permission	No permission

4.3.2.2 DNS

DNS can be used for address resolution. If DHCP is not in use or the DHCP server does not return any DNS server addresses, the identity of a DNS server can be configured via the Administration Console or Web Interface. If a DNS server is not in use, mapping between hostname and IP address cannot be resolved.

4.3.2.3 NTP

The NTP client is used for time synchronization. The NTP server can be configured via the Administration Web Interface. One or more NTP servers can be configured as time references.

4.3.3 IPv4 and IPv6 Support

This product only supports IPv4 connections.

4.4 CONFIGURATION

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

Local AE Titles and its corresponding TCP/IP Ports can be configured via the Administration Web Interface. No Default AE Titles are provided. At least one local AE Title must be configured before the DICOM Application can fully function. One AE Title is capable of serving all the local AE applications.

Table 4-102

AE TITLE CONFIGURATION TABLE

Application Entity	Default AE Title	Default TCP/IP Port
Storage	No Default	104 (Non-Secure) / 2762 (Secure)
Workflow	No Default	104 (Non-Secure) / 2762 (Secure)

4.4.1.2 Remote AE Titles

The AE Title, host name and port number of remote applications can be configured using the Administration Web Interface. A default Calling AE Title should be identified for each remote AE Title during the configuration. This Calling AE Title might be used by the remote application for permission checking. Whether or not the remote AE Title supports encapsulated *Transfer Syntax* can be configured. If not supported, no encapsulated *Transfer Syntax* will be proposed or accepted during the *Presentation Context Negotiation* between any Local AE Title and this remote AE Title.

The remote AE Titles to be used for different DICOM Applications can be specified at each application's configuration, or can be determined at run time. There is no limitation on what applications the remote AE Titles have to server.

4.4.2 Parameters

A number of parameters related to DICOM communication can be configured using the Administration Web Interface. See ImageGrid PACS User Manual for details on general configuration capabilities.

Table 4-103

CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
Listening Port	Yes	104
Secure Listening Port	Yes	2762
Maximum PDU Size	Yes	16384 Bytes

Maximum Inbound Associations	Yes	16
Idle Association Timeout	Yes	600 s
Default Character Encoding	Yes	ISO_IR 100 (LATIN1)
Accept Unprocessable Transfer	Yes	No
Storage Parameters		
Duplicate Image Handling Policy	Yes	Overwrite, Success
Send study status	Yes	Yes
Number of times retrying failed send jobs	Yes	8
Minimal delay between retrying failed send jobs	Yes	60 s
Default Transfer Syntax (Global for all the AEs)	Yes	Original Transfer Syntax

5. MEDIA INTERCHANGE

5.1 IMPLEMENTATION MODEL

5.1.1 Application Data Flow

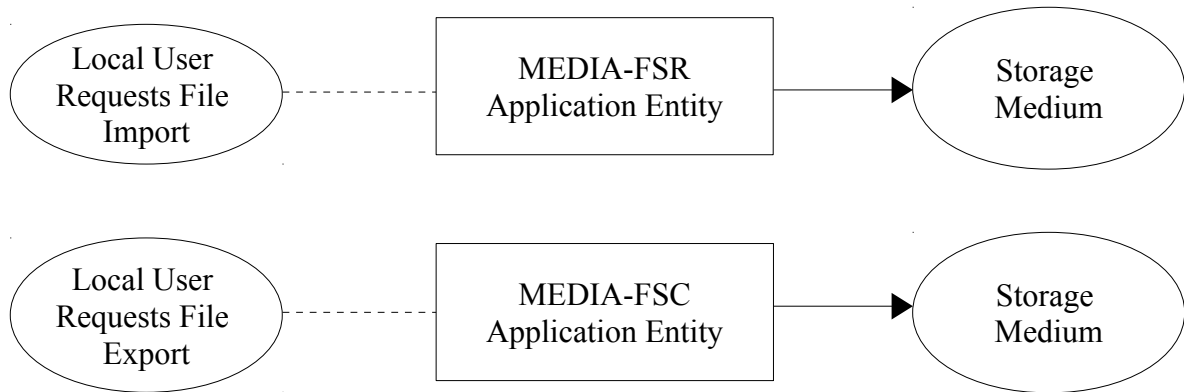


Figure 3: IMPLEMENTATION MODEL

ImageGrid PACS provides media support as a File Set Reader and File Set Creator.

Conceptually it may be modeled as the following single AE:

- MEDIA-FSR, which loads a PS 3.10 compliant DICOMDIR file from PS 3.12 compliant media according to one of the General Purpose *Media Application Profiles* of PS 3.11 (CD-R or DVD-RAM).
- MEDIA-FSC, which creates a PS 3.10 compliant DICOMDIR file from PS 3.12 compliant media according to one of the General Purpose *Media Application Profiles* of PS 3.11 (CD-R or DVD-RAM).

5.1.2 Functional Definitions of AE's

5.1.2.1 MEDIA-FSR

MEDIA-FSR is activated through the user action of loading a supported media into the system's media reader. The studies on the media are listed in the Import Worklist. The user may select one or multiple studies to import.

5.1.2.2 MEDIA-FSC

MEDIA-FSC is activated through the user action of adding local studies to the Export Worklist. Only studies that belong to one single patient can be exported at a time. Each study is listed as one separate export job in the Export Worklist. A supported blank or rewritable media has to be placed in the system's media writer to further initiate the export action. The SOP instances associated with the export jobs will be written to the media.

5.1.3 Sequencing of Real-World Activities

All FSR and FSC activities are sequentially initiated by the user loading media into the system and operating from the Administration Web Interface. One activity may not be initiated until the prior activity is completed.

5.1.4 File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is as follows.

Table 5-1

DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE

Implementation Class UID	1.3.6.1.4.1.2820.0.3.0.0
Implementation Version Name	IGPACS_v2.0

5.2 AE SPECIFICATIONS

5.2.1 MEDIA-FSR

MEDIA-FSR provides standard conformance to the Media Storage Service Class. The Application Profiles and roles are listed below.

Table 5-2

APPLICATION PROFILES, ACTIVITIES, AND ROLES FOR MEDIA-FSR

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Import from CD media	FSR
STD-GEN-DVD-RAM	Import from DVD media	FSR

5.2.1.1 File Meta Information for the Application Entity

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

5.2.1.2 Real World Activities

5.2.1.2.1 Activity – Import from CD/DVD media

MEDIA-FSR is activated through the Administration Web Interface. After the user loads a supported media into the system's media reader, if the media contains a valid DICOMDIR, the content of the media will be displayed in the Import Worklist, from where studies can be selected to be imported into the system.

5.2.1.2.1.1 Media Storage Application Profile

The MEDIA-FSR *Application Entity* supports the *SOP Classes* and *Transfer Syntaxes* listed in the tables below.

Table 5-3

SOP CLASSES FOR MEDIA-FSR

SOP Class Name	SOP Class UID
See Table 4-11	See Table 4-11
Media Storage Directory Storage	1.2.840.10008.1.3.10

Table 5-4
TRANSFER SYNTAXES FOR MEDIA-FSR

Transfer Syntax	Transfer Syntax UID
See Table 4-19	See Table 4-19

5.2.2 MEDIA-FSC

MEDIA-FSC provides standard conformance to the Media Storage Service Class. The Application Profiles and roles are listed below.

Table 5-5
APPLICATION PROFILES, ACTIVITIES, AND ROLES FOR MEDIA-FSC

Application Profiles Supported	Real World Activity	Role
STD-GEN-CD	Export to CD media	FSC
STD-GEN-DVD-RAM	Export to DVD media	FSC

5.2.2.1 File Meta Information for the Application Entity

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

5.2.2.2 Real World Activities

5.2.2.2.1 Activity – Export to CD/DVD media

MEDIA-FSC is activated through the Administration Web Interface. The user can select studies from local AE Titles and add them to the Export Worklist, from where the export to media operation can be started.

5.2.2.2.1.1 Media Storage Application Profile

The MEDIA-FSC *Application Entity* supports the *SOP Classes* and *Transfer Syntaxes* listed in the tables below.

Table 5-6
SOP CLASSES FOR MEDIA-FSC

SOP Class Name	SOP Class UID
See Table 4-11	See Table 4-11
Media Storage Directory Storage	1.2.840.10008.1.3.10

Table 5-7
TRANSFER SYNTAXES FOR MEDIA-FSC

Transfer Syntax	Transfer Syntax UID
See Table 4-19	See Table 4-19

5.3 AUGMENTED AND PRIVATE PROFILES

5.3.1 Augmented Application Profiles

None.

5.3.2 Private Application Profiles

None.

5.4 MEDIA CONFIGURATION

None.

6. SUPPORT OF CHARACTER SETS

6.1 OVERVIEW

The application supports all extended character sets defined in the DICOM 2011 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 the DICOMDIR, in storage instances from media and received over the network, and in the local database.

No specific support for sorting of strings other than in the default character set is provided.

6.2 CHARACTER SETS

Table 6-1

SUPPORTED SPECIFIC CHARACTER SET DEFINED TERMS

Character Set Description	Defined Term
ASCII Graphic	ISO_IR 6
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 (Default Repertoire)	ISO_IR 192
Chinese GB18030	GB18030
ASCII Graphic (with Code Extension)	ISO 2022 IR 6
Latin Alphabet No.1 (with Code Extensions)	ISO 2022 IR 100
Latin Alphabet No.2 (with Code Extensions)	ISO 2022 IR 101
Latin Alphabet No.3 (with Code Extensions)	ISO 2022 IR 109
Latin Alphabet No.4 (with Code Extensions)	ISO 2022 IR 110
Cyrillic (with Code Extensions)	ISO 2022 IR 144

Arabic (with Code Extension)	ISO 2022 IR 127
Greek (with Code Extension)	ISO 2022 IR 126
Hebrew (with Code Extension)	ISO 2022 IR 138
Latin Alphabet No.5 (with Code Extension)	ISO 2022 IR 148
Japanese (with Code Extension)	ISO 2022 IR 13
Thai (with Code Extension)	ISO 2022 IR 166
Japanese (KANJI with Code Extension)	ISO 2022 IR 87
Japanese (SUPP KANJI with Code Extension)	ISO 2022 IR 159
Korean (with Code Extension)	ISO 2022 IR 149

6.3 CHARACTER SET CONFIGURATION

The default character set to be used for DICOM Service can be configured from the Administration Web Interface.

7. SECURITY

7.1 SECURITY PROFILES

None supported.

7.2 ASSOCIATION LEVEL SECURITY

The DICOM Service on ImageGrid PACS can be configured to check the following DICOM values when determining whether to accept *Association* Open Requests:

Calling AE Title

Called AE Title

Each local AE Title (Called AE Title) can be configured to accept *Association* Requests from only a limited list of Calling AE Titles.

The AE Title and Presentation Address mapping of the requestor is not validated.

The system can be configured to block certain IP Addresses or Ranges. This blacklist is global, and it applies to all the DICOM Services and AEs. *Association* requests coming from the blacklist are not able to reach the DICOM Service.

7.3 APPLICATION LEVEL SECURITY

None supported.

8. ANNEXES

8.1 IOD CONTENTS

8.1.1 Created SOP Instance(s)

ImageGrid PACS system is capable of creating instances of Encapsulated PDF Storage and Basic Text SR Storage.

Table 8-1 specifies the *Attributes* of an Encapsulated PDF instance created and transmitted by the storage application of ImageGrid PACS.

Table 8-2 specifies the *Attributes* of a Basic Text SR instance created and transmitted by the storage application of ImageGrid PACS.

The following tables use a number of abbreviations. The abbreviations used in the "Presence of Value" column are:

VNAP	Value not always present (<i>Attribute</i> sent zero length if no value is present)
ANAP	<i>Attribute</i> not always presentation
ALWAYS	Always present
EMPTY	<i>Attribute</i> is created without a value

The abbreviations used in the "Source" column:

USER	the <i>Attribute</i> value source is from user input
AUTO	the <i>Attribute</i> value is generated automatically
EIXSTING	the <i>Attribute</i> value source is from existing information

NOTE: All dates and times are encoded in the local configured calendar and time. Date, Time and Time zone are configured using the Administration Web Interface.

8.1.1.1 Encapsulated PDF Information Object Definition

Table 8-1

IOD OF CREATED ENCAPSULATED PDF INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8-3	ALWAYS
Study	General Study	Table 8-4	ALWAYS
	Patient Study	Table 8-5	ALWAYS
	Requested Procedure	Table 8-6	ALWAYS
Series	Encapsulated Document Series	Table 8-7	ALWAYS
Equipment	General Equipment	Table 8-8	ALWAYS

	SC Equipment	Table 8-9	ALWAYS
Encapsulated Document	Encapsulated Document	Table 8-10	ALWAYS
	SOP Common	Table 8-11	ALWAYS
	Private Application	Table 8-12	ALWAYS

8.1.1.2 Basic Text SR Information Object Definition

Table 8-2

IOD OF CREATED BASIC TEXT SR INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8-3	ALWAYS
Study	General Study	Table 8-4	ALWAYS
	Patient Study	Table 8-5	ALWAYS
	Requested Procedure	Table 8-6	ALWAYS
Visit	Visit Status	Table 8-13	ALWAYS
Series	General Series	Table 8-14	ALWAYS
	SR Document Series	Table 8-15	ALWAYS
Equipment	General Equipment	Table 8-16	ALWAYS
Document	SR Document General	Table 8-17	ALWAYS
	SR Document Content	Table 8-18	ALWAYS
	SOP Common	Table 8-19	ALWAYS
	Private Application	Table 8-20	ALWAYS

8.1.1.3 Common Modules

Table 8-3

PATIENT MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN	Copied from an existing instance of the study	ALWAYS	EXISTING
Patient ID	(0010,0020)	LO	Copied from an existing instance of the study	ALWAYS	EXISTING
Issuer of Patient	(0010,0021)	LO	Copied from an	ANAP	EXISTING

ID			existing instance of the study		
Other Patient IDs	(0010,1000)	LO	Copied from an existing instance of the study	ANAP	EXISTING
Other Patient Names	(0010,1001)	PN	Copied from an existing instance of the study	ANAP	EXISTING
Patient's Birth Date	(0010,0030)	DA	Copied from an existing instance of the study	VNAP	EXISTING
Patient's Birth Time	(0010,0032)	TM	Copied from an existing instance of the study	ANAP	EXISTING
Patient's Sex	(0010,0040)	CS	Copied from an existing instance of the study	VNAP	EXISTING
Patient's Telephone Numbers	(0010,2154)	SH	Copied from an existing instance of the study	ANAP	EXISTING
Ethnic Group	(0010,2160)	SH	Copied from an existing instance of the study	ANAP	EXISTING
Medical Alerts	(0010,2000)	LO	Copied from an existing instance of the study	ANAP	EXISTING
Allergies	(0010,2110)	LO	Copied from an existing instance of the study	ANAP	EXISTING
Patient Species Description	(0010,2201)	LO	Copied from an existing instance of the study	ANAP	EXISTING
Patient Breed Description	(0010,2292)	LO	Copied from an existing instance of the study	ANAP	EXISTING
Responsible Person	(0010,2297)	PN	Copied from an existing instance of the study	ANAP	EXISTING

Table 8-4

GENERAL STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
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Study Instance UID	(0020,000D)	UI	Copied from an existing instance of the study	ALWAYS	EXISTING
Study Date	(0008,0020)	DA	Copied from an existing instance of the study	VNAP	EXISTING
Study Time	(0008,0030)	TM	Copied from an existing instance of the study	VNAP	EXISTING
Referring Physician's Name	(0008,0090)	PN	Copied from an existing instance of the study	VNAP	EXISTING
Referring Physician Identification Sequence	(0008,0096)	SQ	Copied from an existing instance of the study	ANAP	EXISTING
Study ID	(0020,0010)	SH	Copied from an existing instance of the study	VNAP	EXISTING
Accession Number	(0008,0050)	SH	Copied from an existing instance of the study	VNAP	EXISTING
Study Description	(0008,1030)	LO	Copied from an existing instance of the study	ANAP	EXISTING
Name of Physician(s) Reading Study	(0008,1060)	PN	Copied from an existing instance of the study	ANAP	EXISTING
Procedure Code Sequence	(0008,1032)	SQ	Copied from an existing instance of the study	ANAP	EXISTING

Table 8-5

PATIENT STUDY MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of	Source
-----------------------	------------	-----------	--------------	--------------------	---------------

				Value	
Patient's Age	(0010,1010)	AS	Copied from an existing instance of the study	ANAP	EXISTING
Patient's Size	(0010,1020)	DS	Copied from an existing instance of the study	ANAP	EXISTING
Patient's Weight	(0010,1030)	DS	Copied from an existing instance of the study	ANAP	EXISTING
Occupation	(0010,2180)	SH	Copied from an existing instance of the study	ANAP	EXISTING
Admitting Diagnoses Description	(0008,1080)	LO	Copied from an existing instance of the study	ANAP	EXISTING

Table 8-6

REQUESTED PROCEDURE MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Requested Procedure Description	(0032,1060)	LO	Copied from an existing instance of the study	ANAP	EXISTING

8.1.1.4 Encapsulated PDF Modules

Table 8-7

ENCAPSULATED DOCUMENT SERIES MODULE OF CREATED ENCAPSULATED PDF SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	"OT"	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Auto generated UID	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Increment the	ALWAYS	AUTO

			largest existing series number		
Series Description	(0008,103E)	LO	"Attachment"	ALWAYS	AUTO
Request Attributes Sequence	(0040,0275)	SQ	Copied from an existing instance of the study	ANAP	EXISTING

Table 8-8

GENERAL EQUIPMENT MODULE OF CREATED ENCAPSULATED PDF SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Institution Name	(0008,0080)	LO	Copied from an existing instance of the study	VNAP	EXISTING
Manufacturer	(0008,0070)	LO	Empty	EMPTY	AUTO

Table 8-9

SC EQUIPMENT MODULE OF CREATED ENCAPSULATED PDF SOP INSTANCES

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

Table 8-10

ENCAPSULATED DOCUMENT MODULE OF CREATED ENCAPSULATED PDF SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	"1"	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Date when the instance is created	ALWAYS	AUTO
Content Time	(0008,0033)	TM	Time when the instance is created	ALWAYS	AUTO
Acquisition Date Time	(0008,002A)	DT	Date and time when the instance is	ALWAYS	AUTO

			created		
Burned In Annotation	(0028,0301)	CS	"YES"	ALWAYS	AUTO
Document Title	(0042,0010)	ST	User input when adding an attachment	ALWAYS	USER
Concept Name Code Sequence	(0040,A043)	SQ	Empty	ALWAYS	AUTO
MIME Type of Encapsulated Document	(0042,0012)	LO	Automatically detected from the attachment file	ALWAYS	AUTO
Encapsulated Document	(0042,0011)	OB	User uploaded attachment file	ALWAYS	USER

Table 8-11

SOP COMMON MODULE OF CREATED ENCAPSULATED PDF SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	"1.2.840.10008.5.1.4.1.1.104.1"	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Auto generated UID	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	Copied from an existing instance of the study	ALWAYS	EXISTING
Instance Creation Date	(0008,0012)	DA	Date when the instance is created	ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM	Time when the instance is created	ALWAYS	AUTO

Table 8-12

PRIVATE APPLICATION MODULE OF CREATED ENCAPSULATED PDF SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Original File Name	(0009,0005)	LO	The original file name of user uploaded attachment	ALWAYS	USER

8.1.1.5 Basic Text SR Modules

**Table 8-13
VISIT STATUS MODULE OF CREATED SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Current Patient Location	(0038,0300)	LO	Copied from the triggering HL7 message	VNAP	EXISTING

**Table 8-14
GENERAL SERIES MODULE OF CREATED SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Request Attributes Sequence	(0040,0275)	SQ	Copied from an existing instance of the study	ANAP	EXISTING

**Table 8-15
SR DOCUMENT SERIES MODULE OF CREATED SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	"SR"	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI	Auto generated UID	ALWAYS	AUTO
Series Number	(0020,0011)	IS	Empty	EMPTY	AUTO

**Table 8-16
GENERAL EQUIPMENT MODULE OF CREATED SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Institution Name	(0008,0080)	LO	Copied from an existing instance of the study	ANAP	EXISTING

**Table 8-17
SR DOCUMENT GENERAL MODULE OF CREATED SR SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS	Empty	EMPTY	AUTO

Completion Flag	(0040,A491)	CS	"COMPLETE" or "PARTIAL"	ALWAYS	AUTO
Verification Flag	(0040,A493)	CS	"VERIFIED" or "UNVERIFIED"	ALWAYS	AUTO
Content Date	(0008,0023)	DA	Copied from the triggering HL7 message	VNAP	EXISTING
Content Time	(0008,0033)	TM	Copied from the triggering HL7 message	VNAP	EXISTING
Verifying Observer Sequence	(0040,A073)	SQ		ALWAYS	AUTO
> Verifying Observer Name	(0040,A075)	PN	Copied from the triggering HL7 message	VNAP	EXISTING

Table 8-18
SR DOCUMENT CONTENT MODULE OF CREATED SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Value Type	(0040,A040)	CS	"CONTAINER"	ALWAYS	AUTO
Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
> Code Value	(0008,0100)	SH	"11528-7"	ALWAYS	AUTO
> Coding Scheme Designator	(0008,0102)	SH	"LN"	ALWAYS	AUTO
> Code Meaning	(0008,0104)	LO	Description, status, date and time of the report	ALWAYS	AUTO
Content Sequence	(0040,A730)	SQ		ALWAYS	AUTO
> Relationship Type	(0040,A010)	CS	"CONTAINS"	ALWAYS	AUTO
> Value Type	(0040,A040)	CS	"TEXT"	ALWAYS	AUTO
> Text Value	(0040,A160)	UT	Copied from the triggering HL7 message	VNAP	EXISTING
> Concept Name Code Sequence	(0040,A043)	SQ		ALWAYS	AUTO
>> Code Value	(0008,0100)	SH	"121111"	ALWAYS	AUTO
>> Coding Scheme	(0008,0102)	SH	"DCM"	ALWAYS	AUTO

Designator					
>> Code Meaning	(0008,0104)	LO	"Summary"	ALWAYS	AUTO
Continuity of Content	(0040,A050)	CS	"SEPARATE"	ALWAYS	AUTO

Table 8-19

SOP COMMON MODULE OF CREATED SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
SOP Class UID	(0008,0016)	UI	"1.2.840.10008.5.1.4.1.1.88.11"	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI	Auto generated UID	ALWAYS	AUTO
Specific Character Set	(0008,0005)	CS	Copied from an existing instance of the study	ALWAYS	EXISTING

Table 8-20

PRIVATE APPLICATION MODULE OF CREATED SR SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Account Number	(0009,0025)	LO	Copied from the triggering HL7 message	VNAP	EXISTING
Transcriptionist	(0009,0026)	PN	Copied from the triggering HL7 message	VNAP	EXISTING
Transcribed Date	(0009,0027)	DA	Copied from the triggering HL7 message	VNAP	EXISTING
Transcribed Time	(0009,0028)	TM	Copied from the triggering HL7 message	VNAP	EXISTING
Printed Date	(0009,0029)	DA	Copied from the triggering HL7 message	VNAP	EXISTING
Printed Time	(0009,0030)	TM	Copied from the triggering HL7 message	VNAP	EXISTING
Registration Status	(0009,0031)	LO	Copied from the	VNAP	EXISTING

			triggering HL7 message		
Technologist	(0009,0032)	PN	Copied from the triggering HL7 message	VNAP	EXISTING
Result Copied To	(0009,0033)	PN	Copied from the triggering HL7 message	VNAP	EXISTING
Report Header	(0009,0034)	LO	Copied from the triggering HL7 message	VNAP	EXISTING

8.1.2 Usage of Attributes from Received IOD's

ImageGrid PACS makes use of the conventional identification *Attributes* to distinguish patients, studies, series and instances. No *SOP Class* specific fields for images are required.

**Table 8-21
SIGNIFICANT ELEMENTS IN RECEIVED COMPOSITE SOP INSTANCES**

Module	Attribute Name	Tag	Type	Significance
Patient	Patient ID	(0010,0020)	M	Verification on incoming Patient ID is performed. If the Patient ID <i>Attribute</i> is missing or has an empty value, then the Patient's Name will be copied and used as the Patient ID as well. If both the Patient ID and Patient's Name are not available, then a default value " <u>__MISSING_PATIENT_ID__</u> " will be assigned. Patients with the same Patient ID but different name, birth date, or sex will be stored as different patients in the database.
	Patient's Name	(0010,0010)	O	Incoming instances without Patient's Name will be accepted. But this is a key <i>Attribute</i> for identifying a patient.
	Patient's Birth Date	(0010,0030)	O	Incoming instances without Patient's Birth Date will be accepted. But this is a key <i>Attribute</i> for identifying a

				patient.
	Patient's Sex	(0010,0040)	O	Incoming instances without Patient's Sex will be accepted. But this is a key <i>Attribute</i> for identifying a patient.
General Study	Study Instance UID	(0020,000D)	M	Must be provided.
	Study Date	(0008,0020)	O	This is a key <i>Attribute</i> for performing workflow and data management functions.
	Accession Number	(0008,0050)	O	This is a key <i>Attribute</i> for matching <i>SOP Instance</i> with workflow information provided by HIS/RIS.
General Series	Series Instance UID	(0020,000E)	M	Must be provided.
	Modality	(0008,0060)	O	This is a key <i>Attribute</i> for identifying the type of series, and it is utilized by viewing, workflow and data management applications.
SOP Common	SOP Class UID	(0008,0016)	O	Must be provided.
	SOP Instance UID	(0008,0018)	O	Must be provided. If a duplicate <i>SOP Instance UID</i> is received, the duplicate handling policy in DICOM Service settings will apply.

"M" indicates the *Attribute* is mandatory, "O" indicates the *Attribute* is optional. See Table 4-72 and Table 4-73 for *Attributes* in MPPS IOD used by MPPS-SCP.

8.1.3 Attribute Mapping

The mapping between *Attributes* received via HL7 from the RIS or HIS and those supplied in the Modality Worklist is configurable. The default mapping is contained in the table below. Empty cells indicate that there is no mapping for the specific *Attribute*.

**Table 8-22
HL7/MODALITY WORKLIST ATTRIBUTE MAPPING**

DICOM Attribute	DICOM Tag	HL7 Attribute Name	HL7 Segment	Notes
Scheduled Procedure Step				
Scheduled Procedure Step Sequence	(0040,0100)			
> Scheduled Station AET	(0040,0002)			Generated from HL7 Station

				configuration that matches OBR-24 on Station Name
> Scheduled Procedure Step Start Date	(0040,0003)	Quantity/Timing	ORC-7.4	
> Scheduled Procedure Step Start Time	(0040,0006)	Quantity/Timing	ORC-7.4	
> Modality	(0008,0060)			Generated from HL7 Station configuration that matches OBR-24 on Station Name
> Scheduled Performing Physician's Name	(0040,0006)	Technician		
> Scheduled Procedure Step Description	(0040,0007)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
> Scheduled Station Name	(0040,0010)		OBR-24	
> Scheduled Procedure Step ID	(0040,0009)			Auto generated
> Scheduled Procedure Step Location	(0040,0011)			
> Scheduled Protocol Code Sequence	(0040,0008)			
>> Code Value	(0008,0100)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
>> Coding Scheme Designator	(0008,0102)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
>> Coding	(0008,0103)			Generated from

Scheme Version				Procedure configuration that matches OBR-4.1 on Procedure Code
>> Code Meaning	(0008,0104)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
Requested Procedure				
Requested Procedure ID	(0040,1001)		OBR-4	
Requested Procedure Description	(0032,1060)		OBR-4.2	
Requested Procedure Code Sequence	(0032,1064)			
> Code Value	(0008,0100)	Universal Service ID	OBR-4.1	
> Coding Scheme Designator	(0008,0102)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
> Coding Scheme Version	(0008,0103)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
> Code Meaning	(0008,0104)			Generated from Procedure configuration that matches OBR-4.1 on Procedure Code
Study Instance UID	(0020,000D)			Auto generated
Requested Procedure Priority	(0040,1003)		ORC-7.6	
Reason for the Requested Procedure	(0040,1002)			
Imaging Service Request				

Accession Number	(0008,0050)		ORC-3	
Requesting Physician	(0032,1032)		ORC-12	
Referring Physician's Name	(0008,0090)		PV1-8	
Visit Identification				
Admission ID	(0038,0010)			
Institution Name	(0008,0080)			
Visit Status				
Current Patient Location	(0038,0300)			
Patient Identification				
Patient's Name	(0010,0010)		PID-5	
Patient ID	(0010,0020)		PID-3	
Other Patient IDs	(0010,1000)		PID-4	
Patient Demographics				
Patient's Birth Date	(0010,0030)		PID-7	
Patient's Sex	(0010,0040)		PID-8	
Patient's Weight	(0010,1030)			
Confidentiality Constraint on Patient Data Description	(0040,3001)			
Patient Medical				
Patient State	(0038,0500)	Danger Code		
Pregnancy Status	(0010,21C0)	Filler Field 1		
Medical Alerts	(0010,2000)	Relevant Clinical Information		
Allergies	(0010,2110)			
Special Needs	(0038,0050)			

8.1.4 Coerced/Modified Fields

When the Patient ID *Attribute* is missing from the incoming instances, STORAGE-SCP will automatically assign the Patient's Name *Attribute* value to the Patient ID

Attribute, and store it in the database. In case that the Patient's Name *Attribute* is missing as well, a default value “__MISSING_PATIENT_ID__” will be assigned to the Patient ID *Attribute*, while the Patient's Name *Attribute* is left empty. When these instances with the coerced Patient ID are transferred by STORAGE-SCU, the original incoming data set without the coerced value will be used, unless a modification of the Patient ID has been performed by the user.

No other coercion by the *SCP* or *SCU* is performed.

8.2 DATA DICTIONARY OF PRIVATE ATTRIBUTES

The private *Attributes* added to created *SOP Instances* are listed in the table below. ImageGrid PACS reserves blocks of private *Attributes* in group 0009. Further details on usage of these private *Attributes* are contained in Section 8.1.

**Table 8-23
DATA DICTIONARY OF PRIVATE ATTRIBUTES**

Tag	Attribute Name	VR	VM
(0009,0005)	Original File Name	LO	1
(0009,0025)	Account Number	LO	1
(0009,0026)	Transcriptionist	PN	1
(0009,0027)	Transcribed Date	DA	1
(0009,0028)	Transcribed Time	TM	1
(0009,0029)	Printed Date	DA	1
(0009,0030)	Printed Time	TM	1
(0009,0031)	Registration Status	LO	1
(0009,0032)	Technologist	PN	1
(0009,0033)	Result Copied To	PN	1
(0009,0034)	Report Header	LO	1

8.3 CODED TERMINOLOGY AND TEMPLATES

Not applicable.

8.4 GRAYSCALE IMAGE CONSISTENCY

ImageGrid PACS does not support the Greyscale Standard Display Function.

8.5 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

ImageGrid PACS does not claim conformance to any Extended, Specialized or Private *SOP Classes*.

8.6 PRIVATE TRANSFER SYNTAXES

ImageGrid PACS does not employ any Private *Transfer Syntaxes*.

