MediPACS

MediPACS Server – Conformance Document

GLOSSARY

AE: Application Entity
AET: Application Entity Title
PACS: Picture Archive and Communication System
DICOM: Digital Imaging and Communications in Medicine
FSC: File Set Creator
FSR: File Set Reader
HIPAA: Health Insurance Portability and Accountability Act
HTTP: Hyper Text Transfer Protocol
LUT: Look Up Table
NEMA: National Electrical Manufacturers Association
SCP: Service Class Provider
SCU: Service Class User
SOP: Service-Object Pair
SR: Structured Report
UID: Unique ID
UNC: Universal Naming Convention

Table of Contents

1. Introduction

MediPACS is a DICOM 3.0 compliant PACS (Picture Archive and Communication System) application that combines the following components in one machine or one box:

- A DICOM server.
- A PACS server.
- A Web server.

The benefits of MediPACS over the traditional PACS servers are:

- It makes the life of a PACS administrator a lot easier since there is only ONE instead of multiple servers or boxes to maintain.
- Users can freely choose their favorite server platform or hardware,
- Archiving of the PACS database is just as simple as backing up files on a regular server, which makes MediPACS fit seamlessly into the rest of IT infrastructure of the entire organization. A PACS administrator has the freedom to choose their favorite backup solutions, software and/or archive media.

This implementation of MediPACS server is designed to provide the following features:

- MediPACS accepts images from external sources and stores them for later retrieval.
- MediPACS uses DICOM as the interface to external conforming clients. The DICOM server accepts DICOM association requests for the purpose of storing images and for image query and retrieve. MediPACS server will initiate DICOM association requests for the purpose of sending images to an external server, querying remote application entities, or printing images to remote Dicom printers. MediPACS server does not respond to any other type of network communication.
- MediPACS uses Web server as the interface for viewing and managing the PACS database, and for reviewing images on-line through a web browser.
- MediPACS Server supports **Automatic Image Routing Table**, where users can define routing entries based on the following criteria:

Field	Description
Source Application Entity (AE) Title	Images received from the matching Source AE Title will be routed to the destination AE automatically based on the specified **Schedule** below.
Key Attribute Tag	Currently, only the **Patient ID** (0010,0020) and **Referring Physician's Name** (0008,0090) key tags are supported. Users can define a matching pattern string with wild-card characters including '*' and '?', so that if the received image attribute matches with the specified pattern string, MediPACS Server will automatically route the received image to the destination AE based on the specified **Schedule** below.
Destination AE Title	This is the destination AE where the received images will be routed.
Schedule	Route **Immediately** (as soon as received) or based on a **24-hour clock**.
Auto Purge	Whether or not to purge received images after they have been routed successfully to the destination AE(s).

- MediPACS Server supports querying remote DICOM Modality Worklist (**DMWL**) SCP applications and displaying the query results through the web user interface.
- MediPACS Server supports receiving event notifications sent by remote Detached Study Management SCP applications, as well as querying remote Detached Study Management SCP applications for study related information.
- MediPACS Server supports storage of DICOM V3.0 Structure Reports (**SR**), as well as presentation of the Structure Reports through the web user interface.
- MediPACS Server supports DICOM Media Storage Services and File Format (PS 3.10) as a File Set Creator (**FSC**) and File Set Reader (**FSR**) of the **General Purpose CD-R and DVD Interchange Profiles**. From the MediPACS web user interface, users can export selected patients/studies in the MediPACS database to a local directory using DICOM standard directory formats (**DICOMDIR**), which can later be archived into CD-R/RW or DVD-R/RW/RAM for media interchange. Uses can also import external patients/studies from a DICOM Media Storage Service compliant directory or CD/DVD media into the MediPACS database.
- MediPACS Server Supports the **Automatic Purging Storage Directories** feature by allowing the user to define a set of Low-Water and High-Water Marks in terms of disk usage percentage for MediPACS Server archive directories. If **Enabled** by the user and the disk usage percentage of the archive directories has dropped below the user-defined **Low-Water Mark**, MediPACS Server will start to purge older studies stored in the archive directories, by the order of the date the studies were received, until the disk usage percentage has risen above the user-defined **High-Water Mark**. User can also specify optionally a **Destination Folder** to move aged studies instead of permanently delete the aged studies.

- The MediPACS Server supports printing to Dicom compliant remote printers from the MediPACS Server web user interface.
- MediPACS Server supports synchronizing its local database with remote studies stored on external application entities based on user-specified schedule (s). Users can also select whether to synchronize all remote studies or only those recent studies received in the past N days.

2. Implementation Model

MediPACS Server provides for storage, query/retrieval and management of Dicom formatted images and reports. It runs on the following platforms:

- Windows 2000
- Windows 2003 Server
- Windows 2008 Server

as a background process (service) that accepts association requests from external applications. MediPACS server employs a configurable thread pool to service requesting applications. MediPACS server will initiate a DICOM C-STORE association in response to either a C-MOVE request from an external application, user forwarding requests entered from the web user interface, or matches with automatic image routing table entries. MediPACS server is started automatically when Windows starts up, users which have Windows Administrator's privilege can stop and re-start MediPACS server process manually from the "Services" tablet of the Windows Control Panel.

The following parameters of the MediPACS server are configurable:

Registry Value Name	Description	Value Type	Default
ApplicationEntityTitle	Application Entity (AE) title of MediPACS Server	String	MyAeTitle
ServerPortNumber	TCP port number MediPACS Server listens to	DWORD	1234
DefaultArchiveDirectory	Default archive directory for images received from an AE where the '***archivedir***' field is not defined in the '***applentity***' table	String	C:\
StorageFormat	Storage format for received images. Either '***DicomPart10***' format or '***Native***' format without the DICOM header.	String	DicomPart10

TABLE 1. Configurable Parameters For MediPACS Server

2.1 Application Data Flow Diagram

As noted above, MediPACS server does not initiate any action except in response to requests which are received either via DICOM associations or from the web user interface.

2.2 Functional Definition of Application Entities

MediPACS server waits for another application to connect to the TCP/IP port number specified when the application is initiated. When a DICOM association request is received, MediPACS server uses a database table and the following logic to verify the incoming request:

- MediPACS server is permissive when verifying the Called Application Entity Title of the incoming association request. It does not reject an incoming association request based on the specified Called Application Entity Title.
- MediPACS server queries the '***applentity***' table to verify if there is a row whose '***title***' field matches (case insensitive) with the Calling Application Entity Title of the incoming request.
- If there is a match, MediPACS server then verifies that the matching application entity has access to the database, by querying the '***allowaccess***' field of the '***applentity***' table.
- If '***allowaccess***' field is Enabled (non-zero), MediPACS server then proceeds to service the incoming association request.
- If '***allowaccess***' field is Disabled ('***0***') or no matching application entity is found for the Calling Application Entity Title, MediPACS server will reject the incoming association request from this application entity.

2.3 Sequencing of Real-World Activities

See the Association Initiation and Acceptance Policy sections below on real-world activities for all SOP classes supported by MediPACS Server.

3. AE Specifications

MediPACS server is started automatically when Windows starts up. MediPACS server uses a configurable thread pool to service all DICOM 3.0 protocol I/O processing. The number of threads in the thread pool has a default value of 2, and can be configured.

NOTE: Setting a large value for the number of threads in the thread pool does not necessarily increase the overall performance of MediPACS server. It is recommended to set the size of thread pool to be twice the number of available processors or CPU's in the system. MediPACS server needs to be re-started if the size of thread pool is modified.

3.1 AE MediPACS Server - Specification

MediPACS server provides Standard Conformance to the following DICOM 3.0 SOP Classes as a SCU:

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Standalone Overlay Image Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radio fluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Angiographic Bi-plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography (PET) Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2

VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.22
Patient Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Modality Worklist Info Model – FIND	1.2.840.10008.5.1.4.31
Detached Study Management	1.2.840.10008.3.1.2.3.1
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9

TABLE 2. SOP Classes Supported by MediPACS Server as a SCU

MediPACS server provides Standard Conformance to the following DICOM 3.0 SOP Classes as a SCP:

SOP Class Name	**SOP Class UID**
Verification SOP Class	1.2.840.10008.1.1
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Standalone Overlay Image Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10

Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Angiographic Bi-plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography (PET) Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Basic Text Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.11
Enhanced Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.22
Patient Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Patient Root Query/Retrieve Info Model - GET	1.2.840.10008.5.1.4.1.2.1.3
Study Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Study Root Query/Retrieve Info Model - GET	1.2.840.10008.5.1.4.1.2.2.3
Patient/Study Only Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2
Patient/Study Only Query/Retrieve Info Model - GET	1.2.840.10008.5.1.4.1.2.3.3

TABLE 3. SOP Classes Supported by MediPACS Server as a SCP

3.2 Association Establishment Policies

3.2.1 General

The DICOM Application Context Name (ACN) proposed by MediPACS Server is fixed: "*1.2.840.10008.3.1.1*". The maximum PDU size which can be transmitted by MediPACS server is fixed at 32 Kbytes. The maximum PDU size which can be received by MediPACS server is up to 32 Kbytes.

3.2.2 Number of Associations

The number of simultaneous associations which can be accepted by MediPACS server are limited only by the kernel parameters of underlying TCP/IP implementation and resource utilization of the computer where MediPACS server is installed. MediPACS server utilizes a thread pool to service each association request that it receives. Therefore, MediPACS server can have multiple simultaneous connections, and there is no inherent limitation on the total number of simultaneous associations which a MediPACS server can maintain.

3.2.3 Asynchronous Nature

MediPACS server does not support asynchronous operations and will not perform asynchronous window negotiation.

3.2.4 Implementation Identifying Information

MediPACS server provides the following implementation class UID:

1.2.826.0.1.3680043.2.737

MediPACS server provides the following implementation version name:

MEDIPACS01AUG05

3.3 Association Initiation Policy

MediPACS server will attempt to initiate associations in response to user requests from the web user interface to verify DICOM connection status (C-ECHO) to remote Application Entity (AE).

MediPACS server will attempt to initiate associations in response to user requests from the web user interface to query and retrieve (C-FIND) remote Query/Retrieve SCP applications.

MediPACS server will attempt to initiate associations in response to C-MOVE requests from other Application Entities. MediPACS server will only initiate associations in response to valid C-MOVE requests for images that are stored in the database.

MediPACS server will attempt to initiate associations in response to user selected forwarding requests from the web user interface, where users can select one or more patient(s), study(s) or series to forward (C-STORE) to a remote destination application entity (AE).

MediPACS server can also initiate associations to remote destination AE(s) automatically based on the automatic routing table. Users can define entries in

the automatic routing table which consist of a source AE title, destination AE title and a schedule, so that the images received from the specified source AE will be automatically forwarded (C-STORE) to one of more destination AE(s) based on the specified schedule, either as soon as received (Immediately) or on a particular 24-hour clock interval., e.g., 7:00 p.m.

MediPACS Server can initiate Modality Worklist - FIND requests to remote Modality Worklist SCP applications, either in response to unsolicited Study Scheduled N-EVENT-REPORT notifications, or by querying the Worklist SCP regularly based on a configurable polling interval. Users can also initiate Modality Worklist - FIND request by clicking on the ***Get Worklist*** link from the web user interface.

3.3.1 Real-World Activity - Verification

3.3.1.1 Associated Real-World Activity - Verification

From the MediPACS Server web user interface, users can select the '***Application Entity***' Page to display a list of defined application entities (AE). If the TCP port number for an AE is defined, a ***Ping*** link will be displayed in the '***Verify Connection***' column. Clicking on the ***Ping*** link will initiate a C-ECHO request to the TCP port number of the corresponding AE. A confirmation message will be displayed if the C-ECHO request is successfully acknowledged by the remote AE, otherwise a timeout error or any error response from the remote AE will be displayed.

3.3.1.2 Proposed Presentation Contexts - Verification

Table 4 below shows the presentation contexts that are proposed by MediPACS server for verification operations:

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

TABLE 4. Presentation Context For Initiating Verification Requests

3.3.1.3 SOP Specific Conformance Statement - Verification

MediPACS Server provides standard conformance for DICOM SOP Verification class.

3.3.2 Real-World Activity - Query/Retrieve

3.3.2.1 Associated Real-World Activity - Query/Retrieve

From the MediPACS Server web user interface, users can select the '***Application Entity***' Page to display a list of defined application entities (AE). If the TCP port number for an AE is defined, a ***Query/Retrieve*** link will be displayed in the '***Remote Exams***' column. Clicking on the ***Query/Retrieve*** link will initiate a C-FIND request to the TCP port number of the corresponding AE. Any matching patients and/or studies returned by the remote AE will be displayed, otherwise a timeout error or any error response from the remote AE will be displayed.

3.3.2.2 Proposed Presentation Contexts - Query/Retrieve

Table 5 shows the presentation contexts used by MediPACS server when initiating C-FIND requests to remote Query/Retrieve SCP applications.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR	1.2.840.10008.1.2	SCU	None

Model - MOVE		Little Endian			

TABLE 5. Presentation Contexts When Initiating Query/Retrieve Requests

3.3.2.3 SOP Specific Conformance Statement - Query/Retrieve

Table 6 below contains the key matching methods supported by MediPACS Server when initiating C-FIND requests to remote Query/Retrieve SCP applications:

Key Matching Methods	Description	Supported By MediPACS
SV	Single Value Matching	Yes
UM	Universal Matching	Yes
WC	Wild-Card Matching	Yes
DR	Date Range Matching	Yes

TABLE 6. Key Matching Methods Used When Initiating C-FIND Requests

Table 7 below indicates which keys are used by the MediPACS server for the Patient Root information model when initiating C-FIND requests to remote Query/Retrieve SCP applications.

Level	Description	Tag	Matching Method	Type
Patient	Patient Name	0010 0010	SV,UM,WC	R
	Patient ID	0010 0020	SV,UM,WC	U
	Patient´s Birth Date	0010 0030	SV,UM,DR	O
	Patient´s Birth Time	0010 0032		O
	Patient´s Sex	0010 0040		O
	Number of Patient Related Studies	0020 1200		O
	Number of Patient Related Series	0020 1202		O
	Number of Patient Related Instances	0020 1204		O
Study	Study Date	0008 0020	SV,UM,DR	R
	Study Time	0008	SV,UM,DR	R

		0030		
	Accession Number	0008 0050	SV,UM,WC	R
	Referring Physician Name	0008 0090		O
	Study Description	0008 1030		O
	Patient´s Age	0010 1010		O
	Patient´s Size	0010 1020		O
	Patient´s Weight	0010 1030		O
	Study Instance UID	0020 000D	SV,UM	U
	Study ID	0020 0010	SV,UM,WC	R
	Number of Study Related Series	0020 1206		O
	Number of Study Related Instances	0020 1208		O
Series	Series Date	0008 0021	SV,UM,DR	O
	Series Time	0008 0031		O
	Modality	0008 0060	SV,UM,WC	R
	Body Part Examined	0018 0015		O
	Series Instance UID	0020 000E	SV,UM	U
	Series Number	0020 0011	SV,UM	R
	Number of Series Related Instances	0020 1209		O
Image	SOP Class UID	0008 0016	SV,UM	O
	SOP Instance UID	0008 0018	SV,UM	U
	Instance Number	0020 0013	SV,UM	R
	Overlay Number	0020 0022		O

	Curve Number	0020 0024		O
	LUT Number	0020 0026		O
	Samples Per Pixel	0028 0002		O
	Rows	0028 0010		O
	Columns	0028 0011		O
	Bits Allocated	0028 0100		O
	Bits Stored	0028 0101		O
	Pixel Representation	0028 0103		O

TABLE 7. Keys Used by MediPACS for Patient Root Information Model

3.3.3 Real-World Activity - Move Request From An External Node

3.3.3.1 Associated Real-World Activity - Move Request

The associated Real-World activity is a C-MOVE request received from an external application. If an application successfully establishes an association with the MediPACS server and makes a valid C-MOVE request that identifies one or more images known by the MediPACS server, the MediPACS server will query the '***applentity***' database table to see if a matching entry can be found for the specified destination application entity title. If a match is found, the MediPACS server will initiate an association with the destination application entity specified in the incoming C-MOVE request.

3.3.3.2 Proposed Presentation Contexts - Move Request

In response to a C-MOVE request, MediPACS server builds a complete list of images to be moved. The list includes the SOP class of each image to be moved. MediPACS server extracts the unique SOP classes from the image lists and proposes a set of presentation contexts that includes one presentation context for each unique SOP class identified in the image list. Thus, the association request may have a single presentation context or multiple presentation contexts. Each presentation context contains the abstract syntax that identifies one image class as found in the image list.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	See Proposed Transfer	See Proposed Transfer	SCU	None

		Syntaxes below	Syntaxes below		
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
X-Ray Angiographic Bi-plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Digital X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Digital X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Digital Mammography X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Digital Mammography X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
Positron Emission Tomography (PET) Image Storage	1.2.840.10008.5.1.4.1.1.128	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None

RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCU	None

TABLE 8. Presentation Contexts Supported By MediPACS Server as C-STORE SCU

3.3.3.3 Proposed Transfer Syntaxes - Move Request

MediPACS Server supports Implicit VR Little Endian Transfer Syntax. Some images may have been stored by the MediPACS server with private elements whose encoding scheme is unknown by the MediPACS server. These elements will be transmitted by MediPACS server exactly as they were received (in

Implicit VR Little Endian Transfer Syntax), so they should be unaltered upon transmission.

MediPACS Server supports the following additional transfer syntaxes:

Transfer Syntax Name	Transfer Syntax UID
Implicit VR, Little Endian (DICOM Default)	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, JPEG Lossless, Non-hierarchical, First-order prediction (Process 14)	1.2.840.10008.1.2.4.70
Explicit VR, JPEG Lossless (Process 14)	1.2.840.10008.1.2.4.57
Explicit VR, JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
Explicit VR, JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
RLE Lossless	1.2.840.10008.1.2.5

TABLE 9. Transfer Syntaxes Supported by MediPACS Server as C-STORE SCU

When sending images to a remote AE, MediPACS Server will propose the same transfer syntax in which the stored SOP instance is encoded. If the encoding transfer syntax is Explicit VR Little-Endian transfer syntax (UID **1.2.840.10008.1.2.1**), MediPACS Server will also propose the default Implicit VR Little-Endian transfer syntax (UID **1.2.840.10008.1.2**), so that when sending images to applications that do not support the Explicit VR Little-Endian transfer syntax (for example, eFilm), MediPACS Server will translate from the encoding Explicit VR Little-Endian to the Implicit VR Little-Endian transfer syntax.

3.3.3.4 SOP Specific Conformance Statement - Move Request

All C-STORE operations are in the context of a C-MOVE request from an external application. MediPACS server sends one C-MOVE response message for each attempted C-STORE operation. MediPACS server does not attempt any extended negotiation. MediPACS server does not delete any elements from the files it transfers. Therefore the set of optional elements depends entirely on the contents of the files which were originally stored on the MediPACS server.

In the event that MediPACS server receives an unsuccessful C-STORE response, MediPACS server will continue sending the remaining images in the requested set.

3.3.4 Real-World Activity - User Forwarding

3.3.4.1 Associated Real-World Activity - User Forwarding

From the MediPACS web user interface, users can select one or more patient(s), study(s) or series while browsing through the list, if the current user has '***Forward***' privilege or '***Modify***' privilege enabled, there will be a **Forward** button displayed below the listed patient, study or series list. Users can click on

the **Forward** button and then select a destination AE title from a drop-down list of application entities currently defined in the '***applentity***' table.

3.3.4.2 Proposed Presentation Contexts - User Forwarding

Same as Section 3.3.3.2.

3.3.4.3 Proposed Transfer Syntaxes - User Forwarding

Same as Section 3.3.3.3.

3.3.4.4 SOP Specific Conformance Statement - User Forwarding

Same as Section 3.3.3.4.

3.3.5 Real-World Activity - Automatic Routing

3.3.5.1 Associated Real-World Activity - Automatic Routing

MediPACS Server supports automatic image routing based on entries defined in the Automatic Routing table. When an image is received by MediPACS Server, it will query the Automatic Routing table to see if there is an entry matches with the source application entity (AE) title. If a match is found, then the received image will be forwarded to the destination AE title specified for the matching source AE title, based on the schedule specified for the matching entry. If there are multiple matches (multiple destination AEs defined for the same source AE), then the received image will be forwarded to multiple destination AEs based on the corresponding schedule.

Users can add, delete and modify entries in the Automatic Routing table from the MediPACS Server web user interface, given that the logged-in user has the required '***Modify***' privilege enabled.

3.3.5.2 Proposed Presentation Contexts - Automatic Routing

Same as Section 3.3.3.2.

3.3.5.3 Proposed Transfer Syntaxes - Automatic Routing

Same as Section 3.3.3.3.

3.3.5.4 SOP Specific Conformance Statement - Automatic Routing

Same as Section 3.3.3.4.

3.3.6 Real-World Activity - Modality Worklist Management

3.3.6.1 Associated Real-World Activity - Modality Worklist Management

From the MediPACS Server web user interface, users can select the '***Application Entity***' Page to display a list of defined application entities (AE). If the TCP port number for an AE is defined and the remote AE has been defined

as Modality Worklist SCP (**'worklistScp'** column set to **'True'** in the ***'applentity'*** table), a ***Get Worklist*** link will be displayed in the '***Modality Worklist***' column. Clicking on the ***Get Worklist*** link will initiate a Modality Worklist - FIND request to the TCP port number of the corresponding AE. Any matching result returned by the remote Modality Worklist SCP will be displayed, otherwise a timeout error or any error response from the remote AE will be displayed.

MediPACS Server can also receive unsolicited Study-Scheduled N-EVENT-REPORT notifications. MediPACS Server will then send Modality Worklist - FIND commands to query all configured Modality Worklist SCP application entities for the corresponding study.

MediPACS Server also polls any configured Modality Worklist SCP application entities to update the **Worklist** table on a regular basis. The default polling interval is 10 minutes, which can be modified or disabled.

3.3.6.2 Proposed Presentation Contexts - Modality Worklist Management

Table 10 below shows the presentation contexts that are proposed by MediPACS server for Modality Worklist - FIND operations:

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Info Model – FIND	1.2.840.10008.5.1.4.31	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

TABLE 10. Presentation Context For Initiating Modality Worklist - FIND Requests

3.3.6.3 SOP Specific Conformance Statement - Modality Worklist Management

Table 11 below contains the key matching methods supported by MediPACS Server when initiating Modality Worklist-FIND requests to remote Worklist SCP applications:

Key Matching Methods	Description	Supported By MediPACS

SV	Single Value Matching	Yes
UM	Universal Matching	Yes
WC	Wild-Card Matching	Yes
DR	Date Range Matching	Yes

TABLE 11. Key Matching Methods Used When Initiating Modality Worklist-FIND Requests

Table 12 below indicates which keys are used by the MediPACS Server for the Modality Worklist - FIND requests to remote Modality Worklist SCP applications.

Module	Description	Tag	Matching Method	Return Type
Scheduled Procedure Step	Scheduled Procedure Step Sequence	0040 0100		1
	>Modality	0008,0060	UM,WC	1
	>Scheduled Station AE Title	0040 0001	UM,WC	1
	>Scheduled Procedure Step Start Date	0040 0002	SV,UM,DR	1
	>Scheduled Procedure Step Start Time	0040 0003	UM	1
Requested Procedure	Requested Procedure ID	0040 1001	UM,WC	1
	Requested Procedure Description	0032 1060		1C
	Study Instance UID	0020 000D		1
	Referenced Study Sequence	0008 1110		2
	>Referenced SOP Class UID	0008 1150		1C
	>Referenced SOP Instance UID	0008 1155		1C
Imaging Service Request	Accession Number	0008 0050	SV,UM,WC	2
	Referring Physician´s Name	0008 0090	UM	2
	Requesting Physician´s Name	0032 1032		2
Patient Identification	Patient´s Name	0010 0010	SV,UM,WC	1
	Patient ID	0010 1020	SV,UM,WC	1

Patient Demographic	Patient´s Birth Date	0010 1030	SV,UM,DR	2
	Patient´s Sex	0010 1040	SV,UM	2

TABLE 12. Keys Used by MediPACS Server Premium Edition for Modality Worklist - FIND Requests

3.3.7 Real-World Activity - Printing

3.3.7.1 Associated Real-World Activity - Printing

After logging into the MediPACS Server web user interface, if the '***Print***' privilege has been enabled, the current user can select a list of patients, studies, series or images, and click on the **Print** button.

The user can then select the destination remote printer, make any appropriate changes to the print parameters, then click on the **Print** button to send the selected patients, studies, series or images to the printer.

3.3.7.2 Proposed Presentation Contexts – Printing

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta	1.2.840.1000.8.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

TABLE 13. Presentation Context For Printing

3.3.7.3 Proposed Transfer Syntaxes - Printing

See Table 13 above.

3.3.7.4 SOP Specific Conformance Statement - Printing

MediPACS Server supports the following required print SOP classes for the Basic Grayscale Management Meta class:

SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1
Basic Film Box	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

TABLE 14. Required SOP Classes for Basic Grayscale Print Management Meta Class

MediPACS Server supports the following optional print SOP classes for the Basic Grayscale Management Meta class:

SOP Class Name	SOP Class UID
Basic Annotation Box	1.2.840.10008.5.1.1.15

TABLE 15. Optional SOP Classes for Basic Grayscale Print Management Meta Class

3.3.7.4.1 Conformance for Basic Film Session SOP Class

MediPACS Server supports the following attributes for N-CREATE command of the Basic Film Session SOP class:

N-CREATE Attributes of the Basic Film Session SOP class		
Tag	**Description**	**Possible Values**
(2000,0010)	Number of Copies	1 - 99
(2000,0020)	Print Priority	LOW, MED, HIGH
(2000,0030)	Medium Type	BLUE FILM, CLEAR FILM, PAPER
(2000,0040)	Film Destination	MAGAZINE, PROCESSOR, BIN_i
(2000,0050)	Film Session Label	MediPACS-YYYY.MM.DD.MM.HH.SS

TABLE 16. Supported Attributes for N-CREATE of the Basic Film Session SOP class

MediPACS Server also uses N-DELETE to delete the created Basic Film Session SOP instance returned by the remote Print SCP.

3.3.7.4.2 Conformance for SOP Class Basic Film Box

MediPACS Server supports the following attributes for N-CREATE command of the Basic Film Box SOP class:

N-CREATE Attributes of the Basic Film Box SOP class

Tag	Description	Possible Values
(2010,0010)	Image Display Format	STANDARD\C,R; R1,R2,R3; C1,C2,C3; SLIDE; SUPERSLIDE
(2010,0030)	Annotation Display Format ID	Printer secific annotation display format string
(2010,0040)	Film Orientation	LANDSCAPE, PORTRAIT
(2010,0500)	Referenced Film Session Sequence	
(0008,1150)	> Referenced SOP Class UID	
(0008,1155)	> Referenced SOP Instance UID	

TABLE 17. Supported Attributes for N-CREATE of the Basic Film Box SOP class

MediPACS Server also uses N-ACTION to print a complete Basic Film Box SOP instance and N-DELETE to delete the SOP instance after printing is complete.

3.3.7.4.3 Conformance for SOP Class Basic Grayscale Image Box

MediPACS Server supports the following attributes for N-SET command of the Basic Grayscale Image Box SOP class:

N-SET Attributes of the Basic Grayscale Image Box SOP class		
Tag	**Description**	**Possible Values**
(2020,0010)	Image Position	1,2,...
(2020,0110)	Preformatted Grayscale Image Sequence	
(0028,0002)	>Samples Per Pixel	
(0028,0004)	>Photometric Interpretation	MONOCHROME1, MONOCHROME2
(0028,0010)	>Rows	>0
(0028,0011)	>Columns	>0
(0028,0034)	>Pixel Aspect Ratio	1
(0028,0100)	>Bits Allocated	8,16
(0028,0101)	>Bits Stored	8,12
(0028,0102)	>High Bit	7,11
(0028,0103)	>Pixel Representation	0
(7FE0,0010)	>Pixel Data	

TABLE 18. Supported Attributes for N-SET of the Basic Grayscale Image Box SOP class

3.3.7.4.4 Conformance for SOP Class Printer

MediPACS Server supports the following attributes for N-GET command of the Printer Box SOP class:

Tag	Description
(0008,0070)	Manufacturer
(0008,1090)	Manufacturer Model Name
(0018,1000)	Device Serial Number
(0018,1020)	Software Versions
(0018,1200)	Date Last Calibration
(0018,1201)	Last Calibration
(2110,0010)	Printer Status
(2110,0020)	Printer Status Info
(2110,0030)	Printer Name

3.3.7.4.5 Conformance for Basic Annotation Box SOP Class

MediPACS Server supports the following attributes for N-GET command of the Basic Annotation Box SOP Class:

Tag	Description
(2030,0010)	Annotation Position
(2030,0020)	Text String

3.3.8 Real-World Activity - Remote Synchronization

3.3.8.1 Associated Real-World Activity - Remote Synchronization

MediPACS Server supports synchronizing its local database with remote studies stored on external application entities, based on user-specified synchronization schedules for the remote AE.

When adding or modifying an application entity, if the remote AE supports Dicom Query/Retrieve functions as a SCP, i.e., the '***Query/Retrieve SCP***' checkbox is selected, users can select whether to enable or disable remote-synchronization for this remote AE, and whether to synchronize with all remote studies or only those recent studies received within the last N days on the remote AE.

Users can add, delete and modify synchronization schedules (up to 24 per remote AE) from the MediPACS Server web user interface, provided that the logged-in user has the required '***Modify***' privilege enabled.

3.3.8.2 Proposed Presentation Contexts - Remote Synchronization

Same as Section 3.3.2.2.

3.3.8.3 Proposed Transfer Syntaxes - Remote Synchronization

Same as Section 3.3.2.2.

3.3.8.4 SOP Specific Conformance Statement - Remote Synchronization

Same as Section 3.3.2.3.

3.4 Association Acceptance Policy

MediPACS server accepts associations for the purpose of storing images in its database or for the purpose of performing query/retrieve operations on the images that have been previously stored.

MediPACS server will only accept association requests from applications that have been defined during configuration. In addition, the MediPACS server will only store images sent by application entities that have been enabled in the '***applentity***' database table.

3.4.1 Real-Word Activity - Storage

MediPACS server accepts associations from applications that wish to store images using the C-STORE command.

3.4.1.1 Associated Real-World Activity - Storage

The associated Real-World activity associated with the C-STORE operation is the storage of the images on the disk of the system upon which the MediPACS server is running. Images are stored by writing the data set of the C-STORE command directly to disk, either with no further header or interpretation ("Native" format), OR with the standard file header described in the DICOM 3.0 Part 10 document (DICOM Part 10 format).

After an image is stored to disk, the MediPACS server updates the database with patient, study, series and image information; this database is used by the MediPACS server for query/retrieve operations, it is also used by the web server to display patient, study, series, and image information, display stored images through a web browser, and maintain patient/study/series/ image tables for authorized users.

MediPACS server will issue a failure status if it is unable to store the image on disk, if the image does not conform to the IOD of the SOP class under which it was transmitted, or if the MediPACS server is not able to successfully update its database.

3.4.1.2 Presentation Context Table - Storage

The following Presentation Contexts shown in Table 19 are acceptable to the MediPACS server when receiving images.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	See Transfer Syntax	See Transfer Syntax	SCP	None

		Selection Policies Below	Selection Policies Below		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
X-Ray Angiographic Bi-plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Digital X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Digital X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Digital Mammography X-ray Image	1.2.840.10008.5.1.4.1.1.1.2	See Transfer Syntax	See Transfer Syntax	SCP	None

Storage - For Presentation		Selection Policies Below	Selection Policies Below		
Digital Mammography X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	See Transfer Syntax Selection Policies Below	See Transfer Syntax Selection Policies Below	SCP	None
Positron Emission Tomography (PET) Image Storage	1.2.840.10008.5.1.4.1.1.128	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	See Proposed Transfer	See Proposed Transfer	SCP	None

		Syntaxes below	Syntaxes below		
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	See Proposed Transfer Syntaxes below	See Proposed Transfer Syntaxes below	SCP	None

TABLE 21. Acceptable Presentation Contexts for the MediPACS Server

3.4.1.3 SOP Specific Conformance for SOP Class - Storage

The MediPACS server implements Level 2 (Full) conformance for the Storage SOP Class. The raw image files themselves are not modified.

In the event that an image is successfully stored by MediPACS server, it may be accessed by requesting associations with the MediPACS server and performing query/retrieve operations. MediPACS server can also display stored images to web browser clients through the web server interface.

MediPACS server stores images for an indefinite period. The stored images, as well as stored patient, study, series and image database records can be deleted from the web server interface by users authorized with UPDATE privilege to the database.

MediPACS server returns the following status codes in response to a C-STORE request:

Status Code	Status	Description
0000H	Success	Image successfully stored
A700H	Refused	Out of resources, unable to create local file
A701H	Refused	Out of resources, failed to access database
A702H	Refused	Out of resources, memory allocation error
A703H	Refused	Out of resources, conflict with existing patient ID
A900H	Error	Data set does not match SOP Class
C000H	Error	Cannot understand

TABLE 22. C-STORE-RSP Status Returned By MediPACS Server

In the case of an error storing an image, there is no documented method for recovery. Trouble-shooting information can be retrieved from the MediPACS server log file.

3.4.1.4 Presentation Context Acceptance Criterion - Storage

MediPACS server will accept any number of storage SOP classes that are listed in Table 19 above, provided that the requesting application is known to the MediPACS server and has been enabled to store images on the database.

MediPACS server defines no limit on the number of presentation contexts accepted. In the event that MediPACS server runs out of resources when trying to accept multiple presentation contexts, the MediPACS server will reject the association request.

MediPACS server does not check for duplicate presentation contexts and will accept duplicate presentation contexts in the association request.

3.4.1.5 Transfer Syntax Selection Policies - Storage

MediPACS Server supports the Implicit VR Little Endian transfer syntax. Any proposed presentation context which includes the Implicit VR Little Endian transfer syntax will be accepted with the Implicit VR Little Endian transfer syntax. Any proposed presentation context that does not include the Implicit VR Little Endian transfer syntax will be rejected.

MediPACS Server supports the following additional transfer syntaxes:

Transfer Syntax Name	Transfer Syntax UID
Implicit VR, Little Endian (DICOM Default)	1.2.840.10008.1.2
Explicit VR, Little Endian	1.2.840.10008.1.2.1
Explicit VR, JPEG Lossless, Non-hierarchical, First-order prediction (Process 14)	1.2.840.10008.1.2.4.70
Explicit VR, JPEG Lossless (Process 14)	1.2.840.10008.1.2.4.57
Explicit VR, JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
Explicit VR, JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
RLE Lossless	1.2.840.10008.1.2.5

TABLE 23. Transfer Syntaxes Supported by MediPACS Server as C-STORE SCP

When MediPACS Server receives association requests which contain multiple presentation contexts with different transfer syntaxes, MediPACS Server will accept those presentation contexts with supported transfer syntaxes listed above, and reject any presentation context with un-supported transfer syntax. If multiple transfer syntaxes are proposed in a presentation context by the remote C-STORE SCU, and MediPACS Server supports one of more of them, then the first transfer syntax on the list presented will be selected. Users can also define a preferred transfer syntax.

If the defined preferred transfer syntax on the list of transfer syntaxes presented by the remote C-STORE SCU, MediPACS Server will use the specified transfer syntax instead of selecting the first supported transfer syntax from the list presented by the remote AE.

3.4.1.6 Structured Reporting Storage as an SCU and SCP

MediPACS Server provides Standard Conformance to the following DICOM V3.0 Structured Reporting SOP Class as an SCU and SCP.

The following Image Storage SOP Classes may be referenced by instances of Structured Reporting SOP Class.

SOP Class	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Angiographic Bi-plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3
Digital X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Positron Emission Tomography (PET) Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1

VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4

TABLE 24. Structured Reporting SOP Classes Supported by MediPACS Server

3.4.2 Real World Activity - Query/Retrieve

MediPACS server accepts associations from applications that wish to perform query (C-FIND) and retrieve (C-MOVE) operations on images that have been previously stored in the database.

3.4.2.1 Associated Real World Activity - Query/Retrieve

The real-world activity associated with C-FIND and C-MOVE requests are query and retrieval operations initiated by another application. An application other than the MediPACS server queries MediPACS server for patient/study/series/image information that has been previously stored in the database and can request that the MediPACS server send images to a third application entity.

3.4.2.2 Presentation Context Table - Query/Retrieve

Table 23 shows the presentation contexts that may be accepted by MediPACS server for query operations.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Patient Root Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.1.3	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Study Root Query/Retrieve	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit	1.2.840.10008.1.2	SCP	Relational queries

Information Model - FIND		VR Little Endian			
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Study Root Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Patient/Study Only Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Patient/Study Only Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries
Patient/Study Only Information Model - GET	1.2.840.10008.5.1.4.1.2.3.3	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	Relational queries

TABLE 25. Acceptable Presentation Contexts for Query/Retrieve Classes

3.4.2.3 SOP Specific Conformance Statement - Query/Retrieve

MediPACS server supports relational queries in addition to hierarchical queries. Table 24 below indicates which keys are supported by the MediPACS server for the Patient Root information model. Table 25 below indicates which keys are supported by the MediPACS server for the Study Root information model.

MediPACS server also supports the Patient/Study Only information model. The keys supported for that model are the same keys found in Table 24 with a level of either "Patient" or "Study".

Table 24 below contains the key matching methods supported by MediPACS Server when processing C-FIND requests from remote Query/Retrieve SCU applications:

Key Matching Methods	Description	Supported By MediPACS
SV	Single Value Matching	Yes
UM	Universal Matching	Yes

WC	Wild-Card Matching	Yes
DR	Date Range Matching	Yes

TABLE 26. Key Matching Methods Used For Processing C-FIND Requests

Table 25 indicates which keys are supported by the MediPACS server for the Patient Root information model. These tables include all optional and required keys that are supported. Optional keys are supported like required keys.

Level	Description	Tag	Matching Method	Type
Patient	Patient Name	0010 0010	SV,UM,WC	R
	Patient ID	0010 0020	SV,UM,WC	U
	Patient´s Birth Date	0010 0030	SV,UM,DR	O
	Patient´s Birth Time	0010 0032		O
	Patient´s Sex	0010 0040		O
	Number of Patient Related Studies	0020 1200		O
	Number of Patient Related Series	0020 1202		O
	Number of Patient Related Instances	0020 1204		O
Study	Study Date	0008 0020	SV,UM,DR	R
	Study Time	0008 0030	SV,UM,DR	R
	Accession Number	0008 0050	SV,UM,WC	R
	Referring Physician Name	0008 0090		O
	Study Description	0008 1030		O
	Patient´s Age	0010 1010		O
	Patient´s Size	0010 1020		O
	Patient´s Weight	0010 1030		O
	Study Instance UID	0020	SV,UM,WC	U

		000D		
	Study ID	0020 0010	SV,UM,WC	R
	Number of Study Related Series	0020 1206		O
	Number of Study Related Instances	0020 1208		O
Series	Series Date	0008 0021	SV,UM,DR	O
	Series Time	0008 0031		O
	Modality	0008 0060	SV,UM,WC	R
	Body Part Examined	0018 0015		O
	Series Instance UID	0020 000E	SV,UM,WC	U
	Series Number	0020 0011	SV,UM	R
	Number of Series Related Instances	0020 1209		O
Image	Instance Creation Date	0008 0012		O
	Instance Creation Time	0008 0013		O
	SOP Class UID	0008 0016	SV,UM,WC	O
	SOP Instance UID	0008 0018	SV,UM,WC	U
	Instance Number	0020 0013	SV,UM	R
	Overlay Number	0020 0022		O
	Curve Number	0020 0024		O
	LUT Number	0020 0026		O
	Samples Per Pixel	0028 0002		O
	Rows	0028 0010		O
	Columns	0028 0011		O

	Bits Allocated	0028 0100		O
	Bits Stored	0028 0101		O
	Pixel Representation	0028 0103		O

TABLE 27. Keys Supported for Patient Root Information Model

Table 26 indicates which keys are supported by the MediPACS server for the Study Root information model. These tables include all optional and required keys that are supported. Optional keys are supported like required keys.

Level	Description	Tag	Matching Method	Type
Study	Study Date	0008 0020	SV,UM,DR	R
	Study Time	0008 0030	SV,UM,DR	R
	Accession Number	0008 0050	SV,UM,WC	R
	Patient Name	0010 0010	SV,UM,WC	R
	Patient ID	0010 0020	SV,UM,WC	R
	Study ID	0020 0010	SV,UM,WC	R
	Study Instance UID	0020 000D	SV,UM,WC	U
	Referring Physician Name	0008 0090		O
	Study Description	0008 1030		O
	Patient´s Birth Date	0010 0030	SV,UM,DR	O
	Patient´s Birth Time	0010 0032		O
	Patient´s Sex	0010 0040		O
	Patient´s Age	0010 1010		O
	Patient´s Size	0010 1020		O
	Patient´s Weight	0010 1030		O
Series	Series Date	0008 0021	SV,UM,DR	O
	Series Time	0008 0031		O
	Modality	0008 0060	SV,UM,WC	R
	Body Part Examined	0018 0015		O
	Series Number	0020 0011	SV,UM	R
	Series Instance UID	0020 000E	SV,UM,WC	U
Image	Instance Creation Date	0008 0012		O
	Instance Creation Time	0008 0013		O

	SOP Instance UID	0008 0018	SV,UM,WC	U
	SOP Class UID	0008 0016	SV,UM,WC	O
	Image Number	0020 0013	SV,UM	R
	Overlay Number	0020 0022		O
	Curve Number	0020 0024		O
	LUT Number	0020 0026		O
	Samples Per Pixel	0028 0002		O
	Rows	0028 0010		O
	Columns	0028 0011		O
	Bits Allocated	0028 0100		O
	Bits Stored	0028 0101		O
	Pixel Representation	0028 0103		O

TABLE 28. Keys Supported for Study Root Information Model

MediPACS server supports the three FIND SOP classes listed in Table 3. In response to a C-FIND request, MediPACS server returns the following C-FIND-RSP status codes:

Status Code	Status	Description
0000H	Success	Operation performed properly
A700H	Refused	Out of Resources
A900H	Error	Identifier does not match SOP Class
C000H	Error	Unable to Process
FE00H	Cancel	Sub-operations terminated due to Cancel Indication
FF00H	Pending	Sub-operations are continuing

TABLE 29. C-FIND-RSP Status Returned By MediPACS Server

MediPACS server supports the three MOVE SOP classes listed in Table 3. In response to a C-MOVE request, MediPACS server supports the Storage SOP classes that are listed in Table 8 when initiating C-STORE sub-operations.

MediPACS server returns the following status codes in response to a C-MOVE request:

Status Code	Status	Description
0000H	Success	Operation performed properly
A701H	Refused	Out of Resources – Unable to calculate number of matches
A702H	Refused	Out of Resources – Unable to perform sub-operations
A801H	Refused	Move destination unknown
A900H	Error	Identifier does not match SOP Class
B000H	Warning	Sub-operations Complete – One or more Failures
C000H	Error	Unable to Process
FE00H	Cancel	Sub-operations terminated due to Cancel Indication
FF00H	Pending	Sub-operations are continuing

TABLE 30. C-MOVE-RSP Status Returned By MediPACS Server

3.4.2.4 Presentation Context Acceptance Criterion - Query/Retrieve

MediPACS server will accept any number of query SOP classes that are listed above, provided that the requesting application is known to the MediPACS server and has been allowed access to the . MediPACS server defines no limit on the number of presentation contexts accepted. In the event that MediPACS server runs out of resources when trying to accept multiple presentation contexts, MediPACS server will reject the association request.

MediPACS server does not check for duplicate presentation contexts and will accept duplicate presentation contexts.

3.4.2.5 Transfer Syntax Selection Policies - Query/Retrieve

MediPACS server only supports the Implicit VR Little Endian transfer syntax. Any proposed presentation context which includes the Implicit VR Little Endian transfer syntax will be accepted with the Implicit VR Little Endian transfer syntax. Any proposed presentation context that does not include the Implicit VR Little Endian transfer syntax will be rejected.

3.4.3 Real World Activity - Verification

MediPACS server accepts associations from applications that wish to perform a verification (C-ECHO) operation on the MediPACS server.

3.4.3.1 Associated Real World Activity - Verification

The real-world activity associated with the C-ECHO request is that an external application wishes to verify network or server operation without initiating any actual work.

3.4.3.2 Presentation Context Table - Verification

Table 31 shows the presentation contexts that may be accepted by MediPACS server for verification operations..

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

TABLE 31. Acceptable Presentation Contexts for MediPACS Server for Verification

3.4.3.3 SOP Specific Conformance for SOP Class - Verification

MediPACS Server provides standard conformance for DICOM SOP Verification class.

3.4.3.4 Presentation Context Acceptance Criterion - Verification

MediPACS server will accept any number of verification SOP classes that are listed above, provided that the requesting application is allowed access to the MediPACS server. The MediPACS server defines no limit on the number of presentation contexts accepted. In the event that the MediPACS server runs out of resources when trying to accept multiple presentation contexts, MediPACS server will reject the association request.

3.4.3.5 Transfer Syntax Selection Policies - Verification

MediPACS Server only supports the Implicit VR Little Endian transfer syntax when accepting verification requests. Any proposed presentation context which includes the Implicit VR Little Endian transfer syntax will be accepted with the Implicit VR Little Endian transfer syntax. Any proposed presentation context that does not include the Implicit VR Little Endian transfer syntax will be rejected.

3.4.4 Real World Activity - Detached Study Management

MediPACS server accepts unsolicited N-EVENT-REPORT notifications sent from Detached Study Management SCP application entities. MediPACS Server will then issue N-GET request back to the remote SCP to get more information for the corresponding study.

Additionally, upon receipt of the ***Study Scheduled*** event notification sent from the Detached Study Management SCP, MediPACS Server will initiate a Modality Worklist - FIND request to configured Modality Worklist SCP application entity(s) to query about the corresponding study information contained in the event report.

3.4.4.1 Associated Real World Activity - Detached Study Management

When MediPACS Server receives any Detached Study Management N-EVENT-REPORT notifications sent from a Detached Study Management SCP AE, it will first validate the association request by checking the remote AE title against the internal ***'applentity'*** table. If access is ***Enabled*** in the ***'applentity'*** table, the association request will be accepted and the event notification will be processed. Otherwise, the association request will be rejected by MediPACS Server and this event notification will not be processed.

3.4.4.2 Presentation Context Table - Detached Study Management

Table 30 shows the presentation contexts that may be accepted by MediPACS server for Detached Study Management N-EVENT-REPORT notifications.

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Detached Study Management	1.2.840.10008.3.1.2.3.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

TABLE 32. Acceptable Presentation Contexts for MediPACS Server for Detached Study Management

3.4.4.3 SOP Specific Conformance for SOP Class - Detached Study Management

MediPACS Server supports the following attributes in the N-EVENT-REPORT-RQ notification sent from a Detached Study Management SCP application entity:

Event Type Name	Attribute Name	Tag
Study Created	Instance Creation Date	0008 0012

	Referenced Patient Sequence	0008 1120
	>Referenced SOP Class UID	0008 1150
	>Referenced SOP Instance UID	0008 1155
	Referenced Visit Sequence	0008 1125
	>Referenced SOP Class UID	0008 1150
	>Referenced SOP Instance UID	0008 1155
	Instance Creation Time	0008 0013
	Instance Creator UID	0008 0014
	Study Status ID	0032 000A
Study Scheduled	Specific Character Set	0008 0005
	Referenced Patient Sequence	0008 1120
	>Referenced SOP Class UID	0008 1150
	>Referenced SOP Instance UID	0008 1155
	Referenced Visit Sequence	0008 1125
	>Referenced SOP Class UID	0008 1150
	>Referenced SOP Instance UID	0008 1155
	Scheduled Study Start Date	0032 1000
	Scheduled Study Start Time	0032 1001
	Scheduled Study Location	0032 1020
	Scheduled Study Location Application Entity Title	0032 1021
	Requested Procedure Description	0032 1060
	Requested Procedure Code Sequence	0032 1064
	>Code Value	0008 0100
	>Coding Scheme Designator	0008 0102
	>Code Meaning	0008 0104
Patient Arrived	Study Arrival Date	0032 1040
	Study Arrival Time	0032 1041
Study Started	Study Date	0008 0020
	Study Time	0008 0030
Study Completed	Referenced Performed Procedure Step Sequence	0008 1111
	>Referenced SOP Class UID	0008 1150
	>Referenced SOP Instance UID	0008 1155
	Study Completed Date	0032 1050
	Study Completed Time	0032 1051
Study Verified	Referenced Performed Procedure Step	0008 1111

	Sequence	
	>Referenced SOP Class UID	0008 1150
	>Referenced SOP Instance UID	0008 1155
	Study Verified Date	0032 0032
	Study Verified Time	0032 0033
Study Read	Study Read Date	0032 0034
	Study Read Time	0032 0035
Study Deleted		

TABLE 33. Detached Study Management N-Event-Report Notification Attributes

MediPACS Server returns one of the following status codes in the N-EVENT-REPORT-RSP sent back to the Detached Study Management SCP:

Service Status	Further Meaning	Status Codes	Description
Sucess	Sucess	0x0000	Operation performed properly

TABLE 34. Detached Study Management N-EVENT-REPORT-RSP Status Codes

3.4.4.4 Presentation Context Acceptance Criterion - Detached Study Management

MediPACS server will accept any number of Detached Study Management SOP classes that are listed above, provided that the requesting application is allowed access to the MediPACS server. The MediPACS server defines no limit on the number of presentation contexts accepted. In the event that the MediPACS server runs out of resources when trying to accept multiple presentation contexts, MediPACS server will reject the association request.

3.4.4.5 Transfer Syntax Selection Policies - Detached Study Management

MediPACS Server only supports the Implicit VR Little Endian transfer syntax when accepting Detached Study Management N-EVENT-REPORT requests. Any proposed presentation context which includes the Implicit VR Little Endian transfer syntax will be accepted with the Implicit VR Little Endian transfer syntax. Any proposed presentation context that does not include the Implicit VR Little Endian transfer syntax will be rejected.

3.5 DICOM Media Storage Services

MediPACS Server conforms to DICOM Media Storage Service File Format (PS 3.10) and the Media Storage Application Profiles (PS 3.11) for reading images on CD/DVD drive, as well as writing images to a local DICOM file format

directory (**DICOMDIR**) which can be archived into CD-R/RW or DVD-R/RW/RAM/+R/+RW media later.

3.5.1 Media Storage Application Profiles

The following application profiles are supported by MediPACS Server :

Description	Identifier
General Purpose CD-R Interchange	STD-GEN-CD
General Purpose Interchange on DVD-RAM Media	STD-GEN-DVD-RAM

TABLE 35. Supported DICOM Media Storage Application Profiles

3.5.2 Real-World Activities

MediPACS Server supports the following storage SOP classes when importing from DICOM Media Storage format compliant CD/DVD drives, and exporting patients/studies stored in MediPACS Server database to local DICOM Media Storage formatted directories:

Storage SOP Class Name	Storage SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage (retired)	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
X-Ray Angiographic Bi-plane Image Storage (retired)	1.2.840.10008.5.1.4.1.1.12.3
Digital X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20

Positron Emission Tomography (PET) Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4

TABLE 36. Supported Storage SOP Classes for DICOM Part 10 Format Import and Export

When importing or exporting images of the storage SOP classes listed in TABLE 34 above, MediPACS Server supports the transfer syntaxes listed in **TABLE 23** in Section 3.4.1.5.

When importing or exporting images of the storage SOP classes listed in TABLE 34 above, MediPACS Server requires or uses the following mandatory Selection Keys/Attributes defined in DICOM PS 3.10 and PS 3.3:

Directory Record Type	Selection Key Name	Tag
Patient	Patient Name	(0010,0010)
	Patient ID	(0010,0020)
Study	Study UID	(0020,000D)
	Study ID	(0020,0010)
Series	Modality	(0008,0060)
	Series Number	(0020,0011)
Image	Referenced File ID	(0004,1500)
	Referenced SOP Class UID in File	(0004,1510)
	Referenced SOP Instance UID in File	(0004,1511)
	Referenced Transfer Syntax UID in File	(0004,1512)
	Image Number	(0020,0013)
SR Document	Instance Number	(0020,0013)
	Completion Flag	(0040,A491)
	Verification Flag	(0040,A493)
	Content Date	(0008,0023)

	Content Time	(0008,0033)
	Verification DateTime	(0040,A030)
	Concept Name Code Sequence	(0040,A043)

TABLE 37. Mandatory Selection Keys Supported by MediPACS Server Import/Export

3.5.2.1 Real-World Activities: Reading Images from CD/DVD Drives

When reading images from CD/DVD media drives, MediPACS Server will play the role of File Set Reader (**FSR**).

From the MediPACS web user interface, users can import external images stored in CD/DVD media drives by visiting the **Tools** page from the Main Menu Bar, from which users can select the **Import** option by entering:

- Either the CD/DVD media drive and the destination storage directory where the images will be imported and raw image files on the media drive will be copied to the destination directory.
- Or a source DICOM storage format compatible directory with or without **DICOMDIR** directory record, from which the images will be imported into MediPACS Server database but the raw image files are not copied, as the MediPACS Server database records will be linked directly to the source directory.

3.5.2.2 Real-World Activities: Writing Images to Local Directory

When writing images to a local directory using DICOM Media Storage compliant directory formats (**DICOMDIR** directory record), MediPACS Server will play the role of File Set Creator (**FSC**).

From the MediPACS web user interface, users can export patients/studies stored in the MediPACS database to a local directory using the DICOM Media Storage formats, by visiting the **Tools** page from the Main Menu Bar, from which users can select a list of one or more patients/studies, enter a media label for the export, and enter a destination directory to export to. Users will also select the export media types which can be either CD (650 MBytes) or DVD (4.7 GBytes). In case the total size of the selected patients/studies exceeds the storage limit for the selected media type, multiple volumes will be created with the volume number automatically appended to the specified media label.

4. Communication Profiles

4.1 TCP/IP Stack

MediPACS server provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the Standard.

4.1.1 TCP/IP API

MediPACS server uses the TCP/IP stack from Microsoft Windows or Linux platforms upon which it executes. It uses a subroutine library that is based on either Windows Socket API (Winsock 2.0) interface on Windows platforms, or the Berkeley socket interface on Linux platforms.

4.1.2 Physical Media Support

MediPACS server exists as a software application that can be compiled and run on various Windows or Linux platforms. As such, it places no restrictions on the physical network. MediPACS server has been tested using TCP/IP over Ethernet (10/100/1000 Mbps) as well as wireless LAN (IEEE 802.11x variants).

5. Configuration

MediPACS server obtains configuration information from a database table which is stored in a relational database. In this implementation, the relational database is the open source database.

5.1 Security Features

MediPACS server uses the '***applentity***' table to control access. The table allows the MediPACS server to determine which applications are allowed access and where received images should be stored.

5.2 Configurable Parameters

The following parameters may be configured for MediPACS server:

- Application Entity Title
- TCP/IP Port Number
- Storage Format