

MEDarchiver

MEDarchiver Service Class Provider (SCP) Conformance Statement

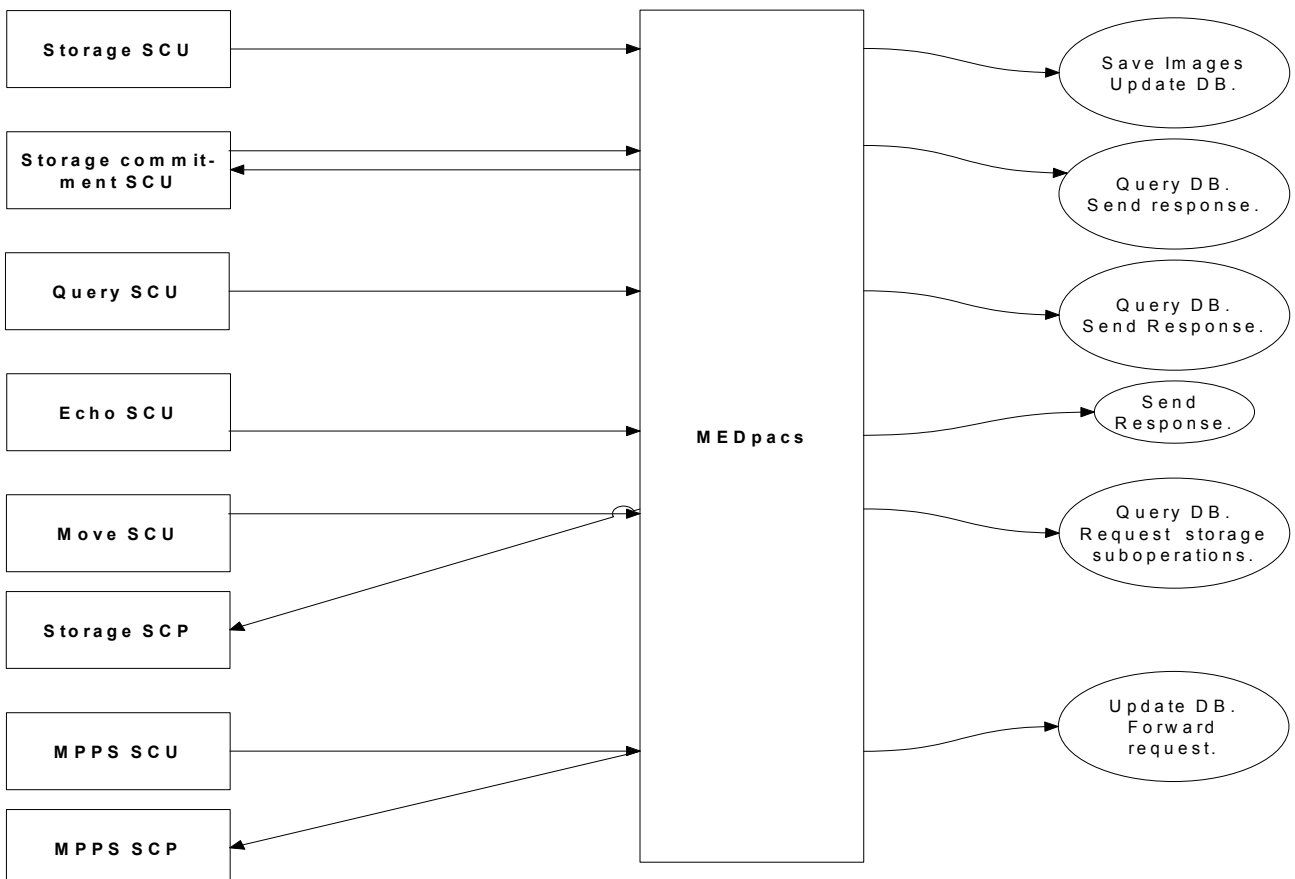
A.0 Introduction

MEDarchiver contains a DICOM server suite called MEDPacs. The MEDpacs suite uses DICOM as interface to the external world. It accepts DICOM associations requests for the purpose of verification, storage, storage commitment, modality performed procedure step (MPPS) management, and query retrieve. MEDpacs does not respond to any other type of network communication.

A.1 Implementation model

MEDpacs runs on Windows server systems as service processes that accepts DICOM association requests from other application entities. For each DICOM association request a new thread is spawned and this thread takes care of the communication with the requesting application. MEDpacs will initiate a new DICOM association in response to a move request, a storage commitment request, or an MPPS request from other application entities. MEDpacs is started automatically at system startup via the WINDOWS service system.

A.1.1 Application data flow diagram



A.1.2 Functional definition of the Application Entity (AE)

After MEDpacs has been launched, it connects to an underlying Oracle database after which it awaits other application entities to connect at specific TCP/IP ports. When another application makes such a DICOM association request, MEDpacs determines from the calling and called AE titles of the request, whether the request may be served or not (this is accomplished via a database call). If the request may be served different actions are taken depending on the type of request:

C-ECHO: A C-ECHO response is send immediately to the requestor.

C-FIND: The query is performed on the underlying database, and C-FIND responses are send to the requestor.

C-MOVE: Query the underlying database, request storage at the move destination on another DICOM association, and send C-MOVE responses to the requestor.

C-STORE: The data are saved as DICOM files on the disk, key attributes of the data are saved in the database, and C-STORE responses are send to the requestor.

N-ACTION for Storage commitment: Save the request in the database, send N-ACTION response to requestor, and finally check whether responsibility for the images in the request can be taken, and open a new association to the requestor, where the result of the Storage commitment is communicated in an N-EVENT-REPORT.

N-CREATE for MPPS: Update database and forward request to dependent AE's—if any.

N-SET for MPPS: Update database and forward request to dependent AE's—if any.

A.1.3 Sequencing of real-world activities

Not applicable.

A.2 AE specifications

A.2.1 MEDpacs specifications

MEDpacs provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU:

Modality performed procedure step service class

Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
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and to the following DICOM V3.0 SOP Classes as an SCP:

Verification service class

Verification SOP Class	1.2.840.10008.1.1
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Query retrieve service classes

Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2

Basic workList management service class

Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31
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Storage commitment service class

Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1
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Storage service classes

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
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

Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
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 Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1
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
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscscopy 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
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1
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
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4

Modality performed procedure step service class

Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
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A.2.1.1 Association establishment policies

A.2.1.1.1 General

MEDpacs will attempt to initiate associations in response to valid C-MOVE, N-Action, N-CREATE, and N-Set requests from other application entities. The absolute maximum value possible for the maximum PDU size which can be transmitted and received by MEDpacs is fixed at 128KB. The default value of this configurable parameter, however, is 16KB.

A.2.1.1.2 Number of associations

The number of simultaneous associations which will be accepted by MEDpacs are limited only by the kernel parameters of the underlying TCP/IP implementation. MEDpacs will spawn a new thread for each association request that it receives. Therefore, MEDpacs can have multiple simultaneous connections, and there is no inherent limitation on the total number of simultaneous associations which MEDpacs can maintain.

A.2.1.1.3 Asynchronous nature

MEDpacs does not support asynchronous operations and will not perform asynchronous negotiation.

A.2.1.1.4 Implementation identifying information

MEDpacs will provide an implementation class UID of **1.2.474.7.4747474.7**, and an implementation version name of **GENBYTE_DCM_200** .

A.2.1.1.2 Association initiation by real-world activity

A.2.1.1.2.1 Real-world activity - Move request from another application entity

MEDpacs accepts associations from application entities that, using the C-MOVE command, wish to perform retrieve operations on images that have previously been stored. This triggers MEDpacs to request DICOM storage at the requested destination.

A.2.1.1.2.1.1 Associated real-world activity - Move Request from another application entity

The associated real-world activity is a C-MOVE request from an external application entity. If an application entity successfully establishes an association with MEDpacs and makes a valid C-MOVE request that identifies one or more images known by MEDpacs, MEDpacs will initiate an association with the destination specified in the C-MOVE request requesting DICOM storage.

A.2.1.1.2.1.2 Proposed presentation contexts

In response to a C-MOVE request, MEDpacs builds a complete list of images to be moved. Since the SOP class and the original transfer syntax of these images are also known, the proposed presentation contexts are those that the images were received and stored with originally.

A.2.1.1.2.1.2.1 SOP specific conformance statement

- All the requested C-STORE operations are in the context of a C-MOVE request from an external application entity.
- The supported storage service class SOP classes for the C-STORE suboperations are the same as those supported when MEDpacs acts as a storage SCP.
- MEDpacs sends one C-MOVE response message for each attempted C-STORE operation, taking no particular action in response to a failure or warning status.
- MEDpacs does not attempt any extended negotiation.
- MEDpacs 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 by MEDpacs.
- In the event that MEDpacs receives an unsuccessful C-STORE response it will continue sending the remaining images in the requested set.

A.2.1.1.2.2 Real-world activity – Storage commitment Request from another application entity

MEDpacs accepts associations from application entities that, using an N-ACTION command, wishes MEDpacs to accept storage commitment for images that have previously been stored. This triggers MEDpacs to send an N-EVENT-REPORT as reply to the requested storage commitment.

A.2.1.1.2.2.1 Associated real-world activity - Storage commitment Request from another application entity

MEDpacs accepts associations from application entities that, using an N-ACTION command, wishes MEDpacs to accept storage commitment for images that have previously been stored. To answer this request, MEDpacs will initiate an association with the storage commitment requestor, and send an N-EVENT-REPORT message to this containing the reply to the storage commitment request.

A.2.1.1.2.2.2 Proposed presentation contexts

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
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
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A.2.1.1.2.2.2.1 SOP specific conformance statement

- No optional attributes are supported in the N-EVENT-REPORT dataset.

A.2.1.1.2.3 Real-world activity – MPPS status update from another application entity

MEDpacs accepts associations from application entities that, using N-CREATE or N-SET commands, wish to inform MEDpacs about the MPPS status. This triggers MEDpacs to forward these commands to other DICOM application entities.

A.2.1.2.3.1 Associated real-world activity - MPPS status update from another application entity

The associated real-world activity is an N-CREATE or N-SET request with the MPPS SOP class from an external application entity. If an application entity successfully establishes an association with MEDpacs and makes a valid N-CREATE or N-SET request, MEDpacs will initiate associations to forward the requests to other DICOM MPPS SCP's. If the forward fails, the MPPS request will be temporarily stored and MEDpacs will try to repeat forwarding the request until the forward request was accepted.

A.2.1.2.3.2 Proposed presentation contexts

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

A.2.1.2.3.2.1 SOP specific conformance statement

- MEDpacs only acts as MPPS SCU when it forwards MPPS requests it has received acting as an MPPS SCP.
- As an MPPS SCU MEDpacs therefore supports the same attributes as those it supports as a MPPS SCP.
- MEDpacs forwards received MPPS requests without any modification.
- If the initial forward of a request fails, MEDpacs will preserve the sequential order of MPPS requests applying to the same MPPS information entity instance.

A.2.1.3 Association acceptance policy

A.2.1.3.1 Real-world activity - Verification

MEDpacs accepts associations from application entities that, using a C-ECHO command, wish to perform a verification operation on MEDpacs.

A.2.1.3.1.1 Associated real-world activity - Verification

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

A.2.1.3.1.2 Presentation context table

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Verification SOP Class	1.2.840.10008.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A.2.1.3.1.2.1 SOP specific conformance statement

Not applicable.

A.2.1.3.1.3 Presentation context acceptance criterion

MEDpacs will accept any number of the SOP classes that are listed in the table in section A.2.1.3.1.2 above. MEDpacs defines no limit on the number of presentation contexts accepted. In the event that MEDpacs runs out of resources when trying to accept multiple presentation contexts, MEDpacs will reject the association request.

A.2.1.3.2 Real-world activity - Storage

MEDpacs accepts associations from application entities that wish to store images using the C-STORE command.

A.2.1.3.2.1 Associated real-world activity - Storage

The real-world activity associated with the C-STORE operation is the storage of images on disk. The images are stored by writing the data set of the C-STORE command directly to disk with meta-header information of MEDpacs. After the image is stored on disk, MEDpacs updates the database with patient, study, series and image information, and therefore after this, the images can take part of query retrieve operations.

A.2.1.3.2.2 Presentation context table

Abstract syntax name	Abstract syntax UID	Transfer syntax	Role	Extended negotiation
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	See note	SCP	None
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1	See note	SCP	None
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	See note	SCP	None
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2	See note	SCP	None
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	See note	SCP	None
Digital Intra-oral X-Ray Image Storage – For Presentation	1.2.840.10008.5.1.4.1.1.1.3	See note	SCP	None
Digital Intra-oral X-Ray Image Storage – For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	See note	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	See note	SCP	None
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3	See note	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	See note	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	See note	SCP	None
Nuclear Medicine Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.5	See note	SCP	None
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	See note	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	See note	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	See note	SCP	None
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8	See note	SCP	None
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9	See note	SCP	None
12-lead ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.1	See note	SCP	None
General ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.2	See note	SCP	None
Ambulatory ECG Waveform Storage	1.2.840.10008.5.1.4.1.1.9.1.3	See note	SCP	None
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1	See note	SCP	None
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1	See note	SCP	None
Basic Voice Audio Waveform Storage	1.2.840.10008.5.1.4.1.1.9.4.1	See note	SCP	None
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10	See note	SCP	None
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11	See note	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	See note	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	See note	SCP	None
X-Ray Radiofluoroscopy Image Storage	1.2.840.10008.5.1.4.1.1.12.2	See note	SCP	None
X-Ray Angiographic Bi-Plane Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.12.3	See note	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	See note	SCP	None
VL Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.1	See note	SCP	None
VL Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1	See note	SCP	None
VL Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2	See note	SCP	None
VL Slide-Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3	See note	SCP	None
VL Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4	See note	SCP	None
VL Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.77.2	See note	SCP	None
Multi-frame Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1	See note	SCP	None
Multi-frame Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2	See note	SCP	None
Multi-frame Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3	See note	SCP	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	See note	SCP	None

Note: The possible transfer syntaxes are given in the following little table.

Transfer syntax name	Transfer syntax UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1
Explicit VR Big Endian	1.2.840.10008.1.2.2
RLE lossless	1.2.840.10008.1.2.5
JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
JPEG Lossless, Non-Hierarchical, First-Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70

A.2.1.3.2.2.1 SOP specific conformance statement

- MEDpacs implements level 2 (full) conformance for the storage SOP Class.
- In the event that an image is successfully stored by MEDpacs, it may be accessed later by requesting associations with MEDpacs performing query retrieve operations.
- MEDpacs is not designed to allow other access to stored images.

- MEDpacs has no method for deleting images once they are stored.
- MEDpacs returns the following C-STORE response codes.

Response	Value
C_STORE_SUCCESS	0x0000
C_STORE_ERROR_CANNOT_UNDERSTAND	0xC000
C_STORE_ERROR_DATASET_DOES_NOT_MATCH_SOP_CLASS	0xA900
C_STORE_REFUSED_OUT_OF_RESOURCES	0xA700

A.2.1.3.2.3 Presentation context acceptance criterion

MEDpacs will accept any number of the SOP classes that are listed in the table in section A.2.1.3.2.2 above. MEDpacs defines no limit on the number of presentation contexts accepted. In the event that MEDpacs runs out of resources when trying to accept multiple presentation contexts, MEDpacs will reject the association request.

A.2.1.3.3 Real-world activity - Query

MEDpacs accepts associations from application entities that, using the C-FIND command, wish to perform query operations on images that have previously been stored.

A.2.1.3.3.1 Associated real-world activity - Query

The real-world activity associated with C-FIND requests are query operations initiated by another application entity. An application other than MEDpacs queries MEDpacs for patient/study/series/image information that has previously been stored by MEDpacs.

A.2.1.3.3.2 Presentation context table

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
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	SCP	None
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	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	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
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
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A.2.1.3.3.2.1 SOP specific conformance statement

- MEDpacs does not support relational searches.
- All matching of attributes of person name type and string type are performed case-insensitive.
- The keys supported for the queries at the different levels are given in the following tables.

At the patient level of query for the patient root and patient study only query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Patient's Name	0010 0010	R
Patient's Birth Date	0010 0030	O
Patient's Sex	0010 0040	O

At the study level of query for the patient root and patient study only query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Study Instance UID	0020 000D	U
Study ID	0020 0010	R
Study Date	0008 0020	R
Study Time	0008 0030	R
Accession Number	0008 0050	R
Study Description	0008 1030	O

At the study level of query for the study root query retrieve information model:

Description	Tag	Type
Study Instance UID	0020 000D	U
Patient's Name	0010 0010	R
Patient ID	0010 0020	R
Study ID	0020 0010	R
Study Date	0008 0020	R
Study Time	0008 0030	R
Accession Number	0008 0050	R
Study Description	0008 1030	O
Patient's Birth Date	0010 0030	O
Patient's Sex	0010 0040	O

At the series level of query for the patient root and study root query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Study Instance UID	0020 000D	U
Series Instance UID	0020 000E	U
Series Number	0020 0011	R
Modality	0008 0060	R

At the image level of query for the patient root and study root query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Study Instance UID	0020 000D	U
Series Instance UID	0020 000E	U
SOP Instance UID	0008 0018	U
Instance Number	0020 0013	R
SOP Class UID	0008 0016	O

For the modality worklist information model:

Description	Tag	Type
Patient's name	0010 0010	R/1
Patient ID	0010 0020	R/1
Scheduled Procedure Step Sequence	0040 0100	R/1
>Modality	0008 0060	R/1
>Scheduled Station AE Title	0040 0001	R/1
>Scheduled Procedure Step Start Date	0040 0002	R/1
>Scheduled Procedure Step Start Time	0040 0003	R/1
>Scheduled Performing Physician's Name	0040 0006	R/2
>Scheduled Procedure Step Description	0040 0007	O/1C
>Scheduled Procedure Step ID	0040 0009	O/1
>Scheduled Station Name	0040 0010	O/2
>Scheduled Procedure Step Location	0040 0011	O/2
Requested Procedure ID	0040 1001	O/1
Requested Procedure Description	0032 1060	O/1C
Study Instance UID	0020 000D	O/1
Requested Procedure Priority	0040 1003	O/2
Accession Number	0008 0050	O/2
Requesting Physician	0032 1032	O/2
Patient's Birth Date	0010 0030	O/2
Patient's Sex	0010 0040	O/2

A.2.1.3.3.3 Presentation context acceptance criterion

MEDpacs will accept any number of the SOP classes that are listed in the table in section A.2.1.3.3.2 above. MEDpacs defines no limit on the number of presentation contexts accepted. In the event that MEDpacs runs out of resources when trying to accept multiple presentation contexts, MEDpacs will reject the association request.

A.2.1.3.4 Real-world activity - Move

MEDpacs accepts associations from application entities that, using the C-MOVE command, wish to perform retrieve operations on images that have previously been stored.

A.2.1.3.4.1 Associated real-world activity - Move

The real-world activity associated with C-MOVE requests are retrieve operations initiated by another application entity. An application other than MEDpacs queries MEDpacs for patient/study/series/image information that has previously been stored and requests that MEDpacs sends images matching the query to a destination.

A.2.1.3.4.2 Presentation context table

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A.2.1.3.4.2.1 SOP specific conformance statement

- MEDpacs does not support relational searches.
- All matching of attributes of person name type and string type are performed case-insensitive.
- The keys supported for the queries at the different levels are given in the following tables.

At the patient level of query for the patient root and patient study only query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Patient's Name	0010 0010	R
Patient's Birth Date	0010 0030	O
Patient's Sex	0010 0040	O

At the study level of query for the patient root and patient study only query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Study Instance UID	0020 000D	U
Study ID	0020 0010	R
Study Date	0008 0020	R
Study Time	0008 0030	R
Accession Number	0008 0050	R
Study Description	0008 1030	O

At the study level of query for the study root query retrieve information model:

Description	Tag	Type
Study Instance UID	0020 000D	U
Patient's Name	0010 0010	R
Patient ID	0010 0020	R
Study ID	0020 0010	R
Study Date	0008 0020	R
Study Time	0008 0030	R
Accession Number	0008 0050	R
Study Description	0008 1030	O

Patient's Birth Date	0010 0030	O
Patient's Sex	0010 0040	O

At the series level of query for the patient root and study root query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Study Instance UID	0020 000D	U
Series Instance UID	0020 000E	U
Series Number	0020 0011	R
Modality	0008 0060	R

At the image level of query for the patient root and study root query retrieve information models:

Description	Tag	Type
Patient ID	0010 0020	U
Study Instance UID	0020 000D	U
Series Instance UID	0020 000E	U
SOP Instance UID	0008 0018	U
Instance Number	0020 0013	R
SOP Class UID	0008 0016	O

A.2.1.3.4.3 Presentation context acceptance criterion

MEDpacs will accept any number of the SOP classes that are listed in the table in section A.2.1.3.4.2 above. MEDpacs defines no limit on the number of presentation contexts accepted. In the event that MEDpacs runs out of resources when trying to accept multiple presentation contexts, MEDpacs will reject the association request.

A.2.1.3.5 Real-world activity – Storage commitment

MEDpacs accepts associations from application entities that, using an N-ACTION command, wish MEDpacs to accept storage commitment for images that have previously been stored.

A.2.1.3.5.1 Associated real-world activity - Storage commitment

The real-world activity associated with the N-ACTION request for Storage commitment is that an application entity wishes that MEDpacs take the responsibility of the storage of specified images.

A.2.1.3.5.2 Presentation context table

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
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
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A.2.1.3.5.2.1 SOP specific conformance statement

- No optional attributes are supported in the N-ACTION dataset.
- The capacity of the storage of MEDpacs depends on the size of the disk array on which the DICOM files are stored.
- MEDpacs will only take responsibility of DICOM files, for which backup copies have been taken on optical media (CD, DVD).
- The Dicom files may be accessed later by requesting associations with MEDpacs performing query retrieve operations.
- MEDpacs has no method for deleting images once they are stored.

A.2.1.3.5.3 Presentation context acceptance criterion

MEDpacs will accept any number of the SOP classes that are listed in the table in section A.2.1.3.5.2 above. MEDpacs defines no limit on the number of presentation contexts accepted. In the event that MEDpacs runs out of resources when trying to accept multiple presentation contexts, MEDpacs will reject the association request.

A.2.1.3.6 Real-world activity - MPPS status update from an external application entity

MEDpacs accepts associations from application entities that, using N-CREATE or N-SET commands, wish to inform MEDpacs about the MPPS status.

A.2.1.3.6.1 Associated real-world activity - MPPS status update from an external application entity

The associated real-world activity is an N-CREATE or N-SET request with the MPPS SOP class from another application entity.

A.2.1.3.6.2 Presentation context table

Abstract syntax name	Abstract syntax UID	Transfer syntax name	Transfer syntax UID	Role	Extended negotiation
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

A.2.1.3.6.2.1 SOP specific conformance statement

No optional attributes are supported in the N-CREATE and N-SET datasets.

A.2.1.3.6.3 Presentation context acceptance criterion

MEDpacs will accept any number of the SOP classes that are listed in the table in section A.2.1.3.6.2 above. MEDpacs defines no limit on the number of presentation contexts accepted. In the event that MEDpacs runs out of resources when trying to accept multiple presentation contexts, MEDpacs will reject the association request.

A.3 Communication profiles

A.3.1 TCP/IP stack

MEDpacs provides the DICOM V.3.0 TCP/IP Network communication layer as defined in part 8 of the standard.

A.3.1.1 TCP/IP API

MEDpacs inherits the TCP/IP stack from the network support of the WINDOWS operating system on which it is installed.

A.4 Extensions/Specializations of SOP classes and transfer syntaxes

Not applicable.

A.5 Configuration

The configuration parameters of MEDpacs are stored in the database and are accessible via a graphical user interface.

A.5.1 AE title/presentation address mapping

The correspondence between an AE title and its presentation address is maintained in a database table.

A.5.2 Configurable parameters

- TCP/IP Ports.
- Maximum PDU size (absolute possible maximum is 128kb, default maximum is 16kb).
- AE title.

A.6 Support of extended character set

Not applicable.

A.7 Codes and controlled terminology

Not applicable.

A.8 Security profiles

Not applicable.