HITACHI
Inspire the Next

MR Imaging System

ECHELON OVAL

V6.0 or later

DICOM Conformance Statement

Rev. 2

Hitachi, Ltd.
Tokyo, Japan

E1E-HM0034-02

DM# 110979 V2

Revision History

Revision	Date	Change Description
1	2016/4	- Initial Version
2	2016/10	- Second Version

Forward

This document specifies the conformance of the Hitachi MR Imaging System to the DICOM 3.0 standard. It is intended to facilitate the process of interconnection between the Hitachi MR Imaging System and other DICOM 3.0 compliant Systems. This document by itself however, does not guarantee interconnectivity or interoperability with other systems. It will be up to the user to make sure that all connected DICOM systems have been validated and will successfully inter-operate.
This validation needs to be performed prior to the clinical use of any data obtained from the Hitachi Imaging System as well as when images acquired on non-Hitachi equipment is processed or displayed on the Hitachi MR Imaging System's console.
Any non-Hitachi vendor should accept full responsibility for all validation required for their connection with the Hitachi MR Imaging System. Hitachi will participate with the validation process whenever required to.

Contents

1.Introduction

1.1 Purpose of this Document

This document is the DICOM Conformance Statement for the Hitachi MR Imaging System. It provides a high level description of the DICOM capabilities of the Application Entity used in the MR Imaging System. The document is formatted according to DICOM PS3.2.
This conformance statement does not apply to other products or medical imaging systems manufactured by Hitachi.

1.2 Related Documents

The DICOM Standard (2003/2004/2006/2007/2008/2009/2011/2014)

1.3 Definitions

Application Entity - Is the Term used for the software application capable of using DICOM services.
DCMserver - The name of the DICOM Transfer Application Entity running on the Hitachi MR Imaging System.

1.4 Acronyms and Abbreviations

The following acronyms and abbreviations are used in this conformance specification.

ACR	American College of Radiology
AE	Application Entity
API	Application Programming Interface
CA	Certificate Authority
DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
GUI	Graphical User Interface
IOD	Information Object Definition
MPPS	Modality Performed Procedure Step
MWL	Modality Worklist
NEMA	North American Electrical Manufacturers Association
PDU	Protocol Data Unit
SCP	Service Class Provider
SCU	Service Class User
SOP	Service Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol
UI	User Interface
UID	Unique Identifier
VR	Value Representation

2. Implementation Model

2.1 Image Transfer and Storage Commitment

The Hitachi MR Imaging System DICOM Server (*DCMserver*) is implemented as a single AE.

Once it has a configuration, *DCMserver* is capable of:

- accepting associations from remote AEs wishing to Query/Retrieve/Store Information Objects in the local database or wishing to establish verification association,
- accepting associations from remote AEs wishing to respond to Storage Commitment requests originated by the Hitachi MR Imaging System, and
- initiating associations to Query/Retrieve/Store/Commit Information Objects in remote AE's

2.1.1 Application Data Flow Diagram

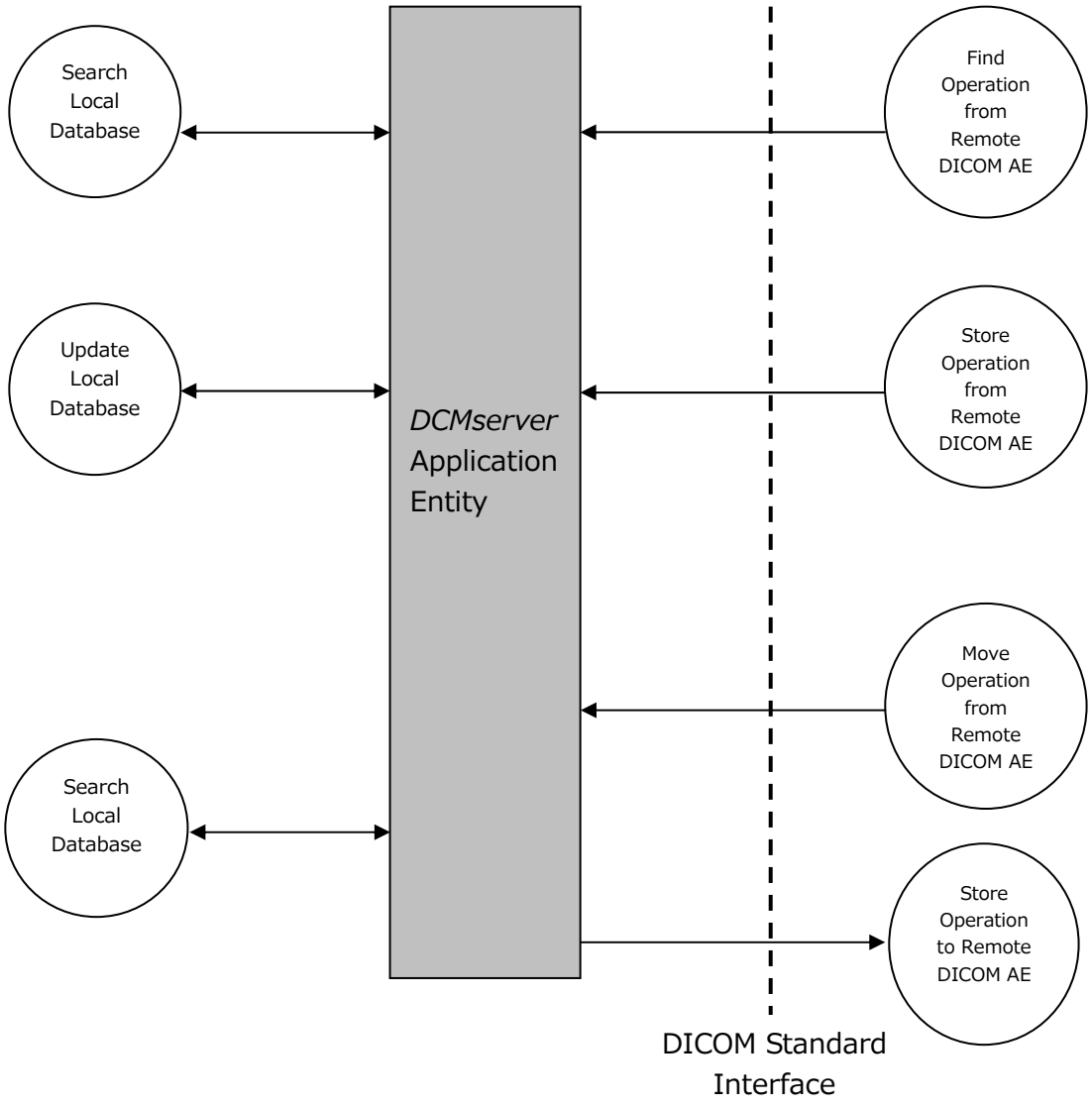

Figure 1 Image Transfer Implementation Model

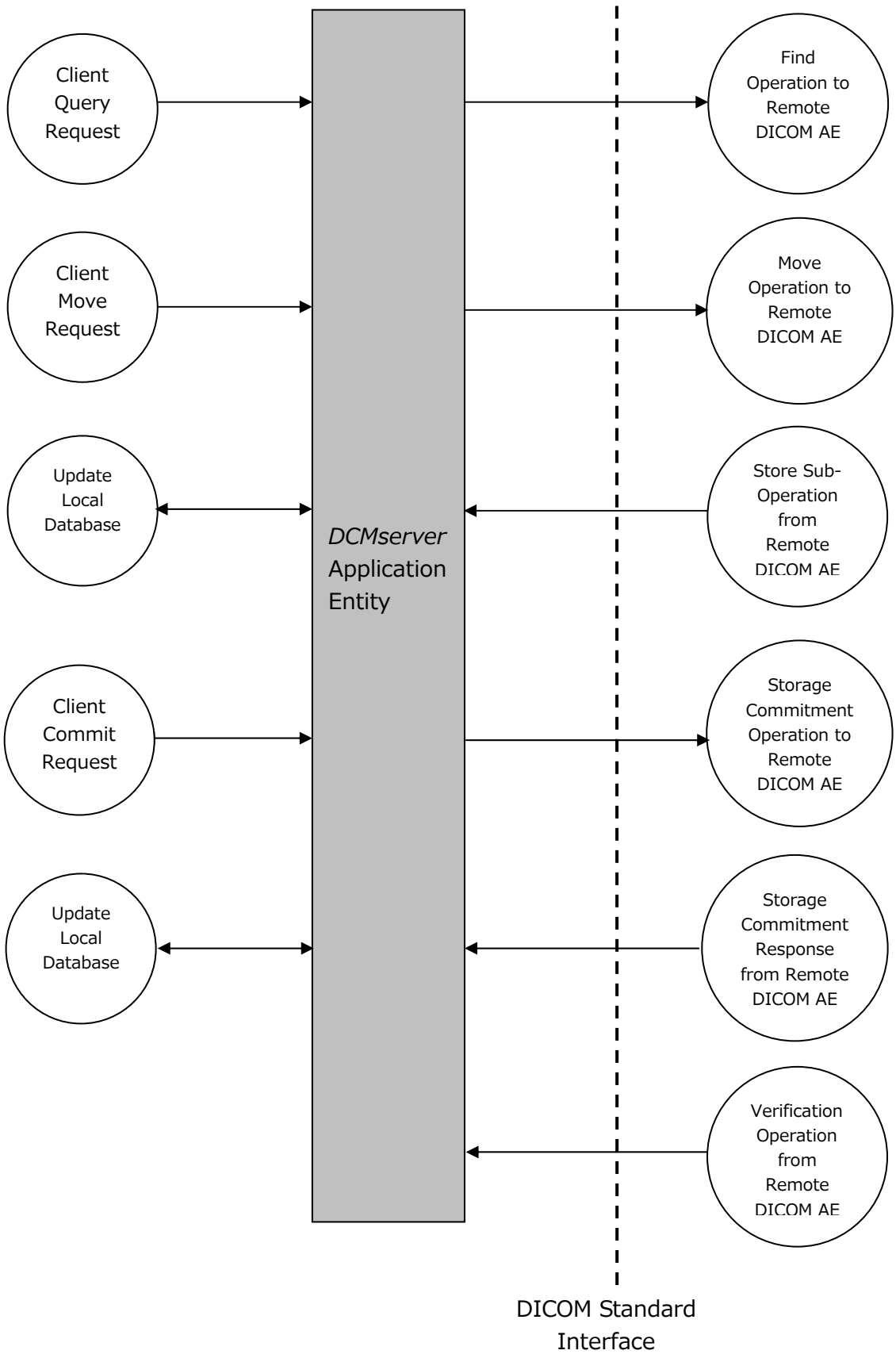

Figure 1 Image Transfer Implementation Model (Continued)

Figure 1 illustrates the following scenarios:

1. Process Find requests from a remote DICOM AE; search the local database for matches and return the requested information.
2. Process Store requests from a remote DICOM AE; update the local database with the object to be stored and return Store responses.
3. Process Move requests from a remote DICOM AE; initiate Store operations to the destination AE and return Move responses to the move requestor AE.
4. Initiate Find operations to a DICOM AE in response to a query request from Hitachi MR Imaging System's GUI application.
5. Initiate Move operations to a DICOM AE in response to a move request from Hitachi MR Imaging System's GUI application. This may result in Store sub-operation from a remote DICOM AE.
6. Initiate Storage Commitment requests to a DICOM AE in response to a commit request from Hitachi MR Imaging System's GUI application.
7. Process Storage Commitment replies from a remote DICOM AE; update the local database accordingly.
8. Process Verification requests from a remote DICOM AE.

2.1.2 Functional Definitions of Application Entities

The startup sequence of the Hitachi MR Imaging System initiates its execution. The *DCMserver* terminates when the Hitachi MR Imaging System is shut down.

The *DCMserver* uses a configuration file that contains information used to validate association attempts from remote AE. The *DCMserver* then listens on the configured port for association requests.

An association request for Storage Services from a remote AE causes the *DCMserver* to validate the request according to the configuration parameters set at execution-time. The remote AE then sends the Information Object Instance. The *DCMserver* stores the received Information Object Instance in its local database if the data does not already exist. The data remains in the database until removed by the local user of the Hitachi MR Imaging System.

An association request from a remote AE for Query or Move Services causes the *DCMserver* to validate the request according to the configuration parameters set at execution time. The remote AE then sends the Query or Retrieve request. The *DCMserver* searches the local database for the instance(s) specified. If the request was C_FIND, then a response is returned for each match. If the request was C-MOVE, then an association is originated to the destination AE specified in the C-MOVE message. Incremental responses are sent to the C-MOVE originator to indicate progress of the request.

A request from the Hitachi MR Imaging System's GUI application causes the *DCMserver* to initiate an association with a remote AE. The user can then initiate query and retrieve requests to the *DCMserver* that are sent to the remote AE. The Hitachi MR Imaging System's console displays the responses from the remote AE.

2.1.3 Sequencing of Real-World Activities

It is expected that requests for Storage Commitment will only be made by the application after successful transfer of the related SOP Instances to a remote AE. This is not enforced, however, since the user can request Storage Commitment manually for the images of any patient, study, or series available on the local system. It is therefore possible that a Storage Commitment request may be issued before successful transfer of the related SOP Instances.

2.2 Print Management

This *DCMserver* accepts commands from the Hitachi MR Imaging System's user through a GUI. The GUI allows the user to prepare and submit print operations to the *DCMserver*.

2.2.1 Application Data Flow Diagram

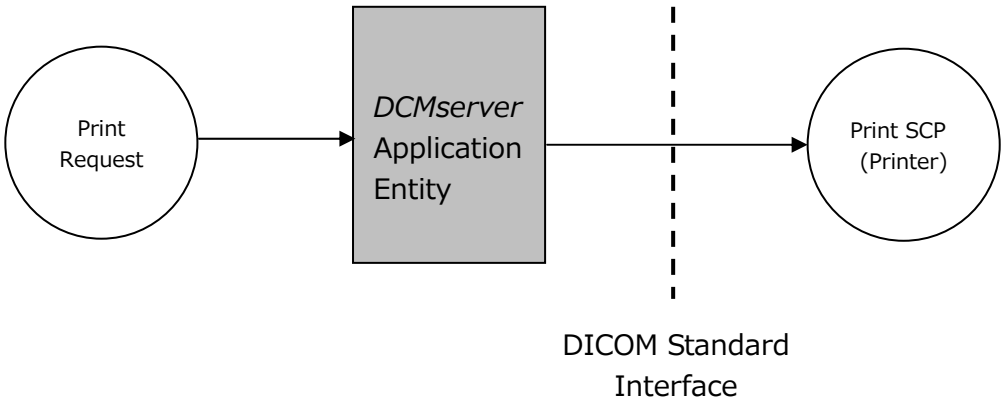

Figure 2 Print Management Implementation Model

The Hitachi MR user submits a print job to the *DCMserver*. The *DCMserver* proceeds to initiate an association to a specific Basic Grayscale/Color Print Management Meta Service Class Provider. The hardcopy information is then sent to the printer over this established association using the accepted DICOM protocol.

2.2.2 Functional Definitions of Application Entities

The startup sequence of the Hitachi MR Imaging System initiates its execution. The *DCMserver* is shut down when the Hitachi MR Imaging System terminates.

The *DCMserver* uses a configuration file that contains information used to configure supported remote Print SCPs.

A request from the Hitachi MR Imaging System's GUI application causes the *DCMserver* component to initiate an association with a Remote AE. The Hitachi MR Imaging System's console displays relevant status and error responses from the Remote AE.

2.2.3 Sequencing of Real-World Activities

Not applicable.

2.3 Basic Worklist Management

The *DCMserver* implements the Basic Worklist Management Service, DICOM PS3.4, Annex K.

2.3.1 Application Data Flow Diagram

The following figure depicts the application data flow.

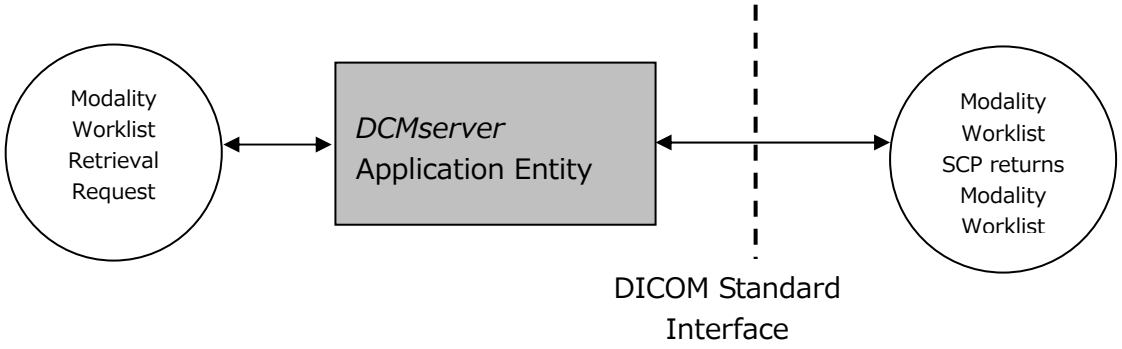

Figure 3 Modality Worklist Data Flow Diagram

The Hitachi MR user initiates Modality Worklist retrieval requests by interacting with *DCMserver* through the GUI. The *DCMserver* initiates an association with the remote AE and uses the Basic Modality Worklist Service Class to retrieve Worklists. The remote AE responds to the request and send Worklists to the *DCMserver*. The *DCMserver* presents the retrieved Worklists to the Hitachi MR user through the Graphical User Interface.
The Hitachi MR Imaging System automatically initiates the Modality Worklist retrieval request when the Hitachi MR user starts scheduled procedures. The retrieved Worklists are used to validate the scheduled procedures.

2.3.2 Functional Definitions of Application Entities

DCMserver acts as a Modality Worklist SCU in order to retrieve a Modality Worklist from a Modality Worklist SCP. In particular, *DCMserver*

1. Specify the AE Title of the Modality Worklist SCU (*DCMserver*)
2. Specify the AE Title, Host Name, Port Number of the Modality Worklist SCP
3. Specify the Required/Optional Matching Key Attributes
4. Request Modality Worklist Retrieval
5. Cancel Modality Worklist Retrieval[1]
6. Access Individual Items of Modality Worklist
7. Access Individual Attributes of Modality Worklist Item

When the Hitachi MR user issues a request to retrieve a Modality Worklist, the *DCMserver* initiates an Association to the Modality Worklist SCP.

When the Association has been established, *DCMserver* sends a C-FIND request to the Modality Worklist SCP to retrieve a Modality Worklist.

When the Modality Worklist has been received, the Hitachi MR user is notified about the availability of the Modality Worklist.

The Hitachi MR user can access all Items of the Modality Worklist which are.

After the last C-FIND response is received, the *DCMserver* releases the association to the Modality Worklist SCP

2.3.3 Sequencing of Real-World Activities

Not applicable.

[1] Cancel is not available to the Hitachi MR user. user, however, the Hitachi MR Imaging System may cancel a query in some exceptional situations.

2.4 Modality Performed Procedure Step

The *DCMserver* implements the MPPS (Modality Performed Procedure Step) SOP Class, DICOM PS3.4, Annex F.7.

2.4.1 Application Data Flow Diagram

The following figure depicts the application data flow.

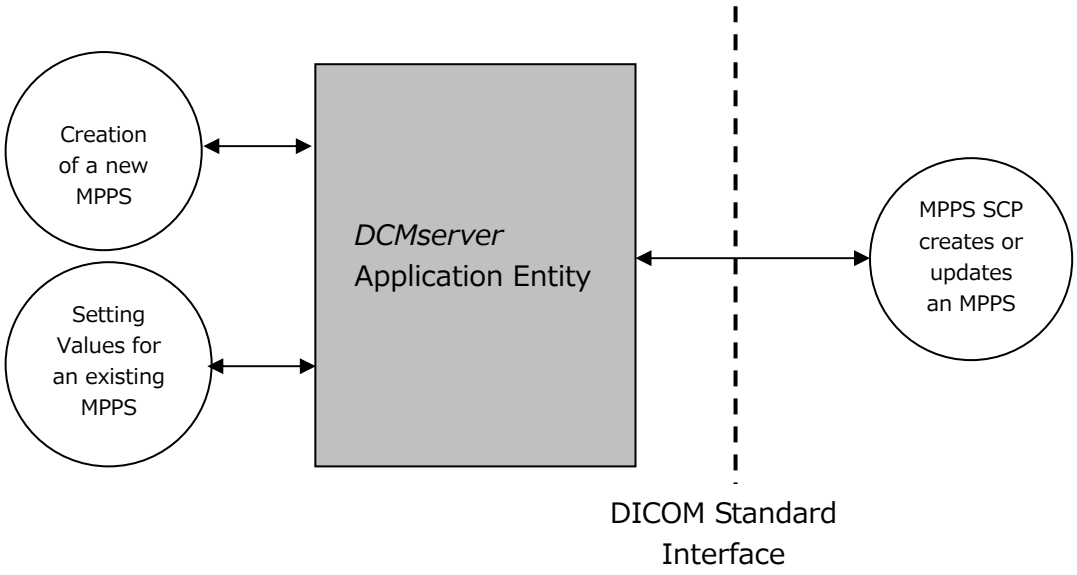

Figure 4 MPPS Implementation Model

DCMserver initiates N-CREATE or N-SET requests to a remote DICOM AE (Modality Performed Procedure Step SCP) in response to a user request to create or update a performed procedure step or to an automatic creation of a performed procedure step caused by initiation of image creation. The application will create the MPPS with "IN PROGRESS" status, and may update with the MPPS with "COMPLETED" or "DISCONTINUED" status.

2.4.2 Functional Definitions of Application Entities

DCMserver acts as an MPPS SCU in order to notify the MPPS SCP about the start and the end of the procedure step. More specially, *DCMserver*;

1. Provides the AE Title of the MPPS SCU (*DCMserver*)
2. Provides the AE Title, Host Name and Port Number of the MPPS SCP
3. Issues a connect request in order to see what operations the remote SCP supports
4. Requests the MPPS SCP to create a new MPPS or update/set some values for an existing one. The *DCMserver*;
   - Sends an N-CREATE or N-SET request to the MPPS SCP. The request contains the set of attributes that should be used for creating a new step or updating an existing step (See *Annex C*).
   - Receives N-CREATE/N-SET responses.
5. Disconnects from remote MPPS SCP

When *DCMserver* issues a request to create a new MPPS on the SCP, it initiates an association to the MPPS SCP. If successful, an N-CREATE operation is performed against the MPPS SCP. After completion of the operation, the assocaition is closed.

When *DCMserver* issues a request to set some values for an existing MPPS on the SCP, it initiates an association to the MPPS SCP. If successful, and N-SET operation is performed against the MPPS SCP. After completion of the operation, the association is closed.

2.4.3 Sequencing of Real-World Activities

DCMserver will first create a MPPS on SCP and then attempt to set/update some values in it.

2.5 Media Storage

DCMserver is implemented that creates and/or updates 120mm DVD-R/DVD+R and 120mm CD-R with various DICOM SOP instances. For the rest of the document we refer to media as one of the following 4.7 GB DVD-R/ DVD+R and 650MB CD-R.

2.5.1 Application Data Flow Diagram

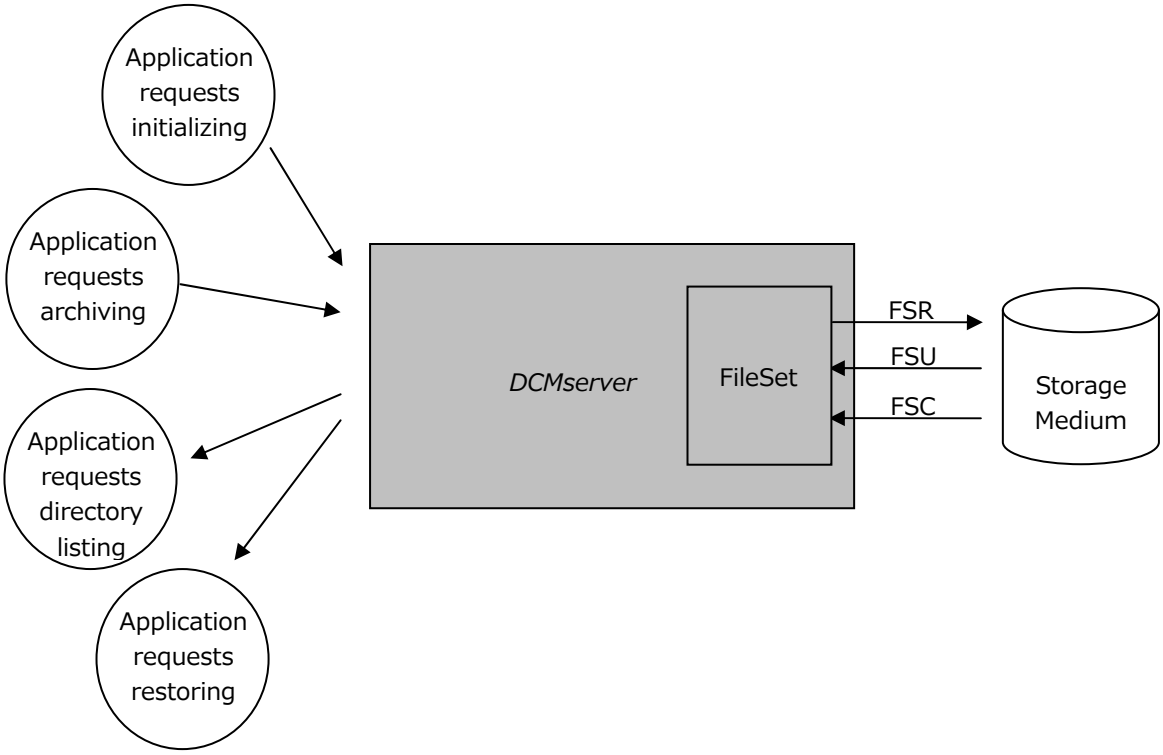

Figure 5: Media Storage Management Implementation Model

DCMserver may connect to one media. The *DCMserver* may have a local/remote storage media that may contain various SOP instances. These may have been obtained by original creation, network transfer or by removable media using other application entities. These instances of other application entities are external to this conformance statement.

The Hitachi MR Imaging system's GUI application submits media requests to *DCMserver* via internal client/server mechanism. The *DCMserver* then processes those requests and accesses, via FileSet, the media according to Media Storage Service Class defined in PS 3.4 with the interchange option. The *DCMserver* accesses, via *Ioagent*, the media acting as one of following roles FSC (File-set Creator), FSU (File-set Updater) and FSR (File-set Reader), defined in PS 3.10.

2.5.2 Functional Definitions of Application Entities

The startup sequence of the Hitachi MR Imaging System initiates the *DCMserver* execution. The *DCMserver* terminates when the Hitachi MR Imaging System is shut down.

A request from the Hitachi MR Imaging System causes the *DCMserver* to interpret the request and act, in a sequence of operations (driven by request type), as a FSU, FSC and/or FSR to complete the request received from the Hitachi MR Imaging System's GUI application.

The set of operations that DCMserver can perform are as following:

- initialize a new media, by writing a new DICOM file-set onto the media;
- display a directory listing of a DICOM file-set on the media. The listing is provided to the user in response to a query.
- retrieve the SOP instances from the media to local database.
- store the DICOM file-set media with new SOP instances.

2.5.3 Sequencing of Real-World Activities

- A retrieve operation can only be performed on DVD-RAM, DVD-R, DVD+R and CD-R media that had performed a store operation.

2.5.4 File Meta Information Options

Implementation Class UID and Implementation Version Name are specified in the *DCMserver*'s configuration file.

3. Image Transfer Application Entity Specifications

The Hitachi MR Imaging System's DICOM Image Transfer capability consists of two logical components (SCU and SCP).
The SCU portion originates associations for Store, Query, Retrieve and Storage Commitment operations. The SCP portion accepts associations for Store, Query and Retrieve operations. The SCU portion will also accept associations to negotiate a role selection of SCU for Storage Commitment responses that are sent on a different association than the request. The two components are configured with the same AE Title for use in the Hitachi MR Imaging System. They are treated as a single AE in this description.

The *DCMserver* AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Patient Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1

The *DCMserver* AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Patient Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Storage Commitment Push Model	1.2.840.10008.5.1.20.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59

3.1 Association Establishment Policies

3.1.1 General

The Hitachi MR Imaging System's GUI allows the user to select the AE to associate with for Store, Query, Retrieve and Storage Commitment operations. The configuration file contains the configuration parameters such as host name, port number and specific SOP Classes to negotiate for each accessible AE.

The *DCMserver* will respond to association requests from remote AEs, however, it will only accept associations from those remote AEs on which it has knowledge. And it will only accept those Presentation Contexts that it is configured to support for the specific requesting AE. The AEs can be configured to allow or deny any service on a per remote AE basis.

The *DCMserver* AE always accepts the Verification SOP Class.

3.1.2 Number of Associations

The *DCMserver* can initiate single associations concurrently.

3.1.3 Asynchronous Nature

The *DCMserver* does not support multiple outstanding transactions.

3.1.4 Implementation Identifying Information

The *DCMserver* have Implementation Class UID and the version name.

3.2 Association Initiation by Real World Activity

This section details the action of the *DCMserver* SCU component as a result of user initiated activity on the Hitachi MR Imaging System's console.

3.2.1 Query Request

3.2.1.1 Associated Real World Activity

The Hitachi MR user selects the "Query" operation on the user interface. Wild card or specific information can be specified by the user for Patient Name and/or Patient ID.

Query will also be issued before a move request to verify the existence of images with a Study or Series.

3.2.1.2 Proposed Presentation Contexts

The following table describes the Presentation Contexts that may be presented for the Query request.
The configuration file contains 1 of the listed Abstract Syntax's.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query / Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query / Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Storage Commitment Push Model	1.2.840.10008.5.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.2.1.3 SOP Specific Conformance for Patient Root Query/Retrieve Model - FIND

The *DCMserver* does not use Extended Negotiation.
The *DCMserver* does not negotiate Relational Queries.
The Keys supported are listed below:

Patient Level Keys

Description	Tag	Type
Patient's Name	0010,0010	R
Patient ID	0010,0020	U
Patient's Birth Date	0010,0030	O
Patient's Birth Time	0010,0032	O
Patient's Sex	0010,0040	O
Other Patient IDs	0010,1000	O
Other Patient Names	0010,1001	O
Ethnic Group	0010,2160	O
Patient Comments	0010,4000	O

Study Level Keys

Description	Tag	Type
Study Date	0008,0020	R
Study Time	0008,0030	R
Accession Number	0008,0050	R
Study ID	0020,0010	R
Study Instance UID	0020,000D	U
Referring Physician's Name	0008,0090	O

Series Level Keys

Description	Tag	Type
Modality	0008,0060	R
Series Number	0020,0011	R
Series Instance UID	0020,000E	U

Image Level Keys

Description	Tag	Type
Instance Number	0020,0013	R
SOP Instance UID	0008,0018	U
SOP Class UID	0008,0016	O

3.2.1.4 SOP Specific Conformance for Study Root Query/Retrieve Model - FIND

The *DCMserver* does not use Extended Negotiation.
The *DCMserver* does not negotiate Relational Queries.
The Keys supported are listed below:

Study Level Keys

Description	Tag	Type
Study Date	0008,0020	R
Study Time	0008,0030	R
Accession Number	0008,0050	R
Patient's Name	0010,0010	R
Patient ID	0010,0020	U
Study ID	0020,0010	R
Study Instance UID	0020,000D	U
Referring Physician's Name	0008,0090	O

Series Level Keys

Description	Tag	Type
Modality	0008,0060	R
Series Number	0020,0011	R
Series Instance UID	0020,000E	U

Image Level Keys

Description	Tag	Type
SOP Instance UID	0008,0018	U

3.2.2 Move Request

3.2.2.1 Associated Real World Activity

The user selects one or more patients, studies and/or series within studies from a list presented as a result of a previous Query operation.
The user of the Hitachi MR Imaging System then selects the "Send" operation on the user interface to initiate the move operation. The destination AE Title is selectable on the GUI.

3.2.2.2 Proposed Presentation Contexts

The following table describes the Presentation Contexts that may be presented for the Move request.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query / Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query / Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Storage Commitment Push Model	1.2.840.10008.5.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.2.2.3 SOP Specific Conformance for Patient Root Query/Retrieve Model - MOVE

The *DCMserver* supports transfers against the Patient Query/Retrieve Information Model described in Section C.6.1.1 of DICOM PS3.4 Annex C using the C-MOVE SCU behavior described in Section C.4.2.2 of DICOM PS3.4 Annex C.

3.2.2.4 SOP Specific Conformance for Study Root Query/Retrieve Model - MOVE

The *DCMserver* supports transfers against the Study Query/Retrieve Information Model described in Section C.6.2.1 of DICOM PS3.4 Annex C using the C-MOVE SCU behavior described in Section C.4.2.2 of DICOM PS3.4 Annex C.

3.2.3 Store Request

3.2.3.1 Associated Real World Activity

The *DCMserver* AE initiates an association for C-STORE if it has received a valid C-MOVE message from a local use of Hitachi MR Imaging System or a remote AE. The SOP Class UID of the Information Object to be sent over the C-STORE context is used to verify that a valid Presentation Context exists prior to issuing the C-STORE message. A mismatch results in no message being sent but the association remains active.

3.2.3.2 Proposed Presentation Contexts

The following table describes the Presentation Contexts that may be presented for the Store request.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.2.3.3 SOP Specific Conformance for C-STORE

The *DCMserver* AE supports transfers as an SCU as described in DICOM PS3.4 Annex B.

The status returned by the accepting AE is used to indicate success or failures of the C-MOVE sub-operation which initiated the transfer. In no case is the Information Object deleted from the local database.

Extended negotiation is not used by *DCMserver* for this SOP Class.

3.2.4 Storage Commitment Request

3.2.4.1 Associated Real World Activity

There are two events that may cause a Storage Commitment association request to occur. If the application is so configured, the Storage Commitment request may be made automatically after successful completion of a move operation from the local AE to a remote AE. Alternatively, the user may select a set of patients, studies, or series from a previous query request and manually request Storage Commitment for these items from a selectable AE.

3.2.4.2 Proposed Presentation Contexts

The following table describes the Presentation Contexts that may be presented for the Storage Commitment request.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query / Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Patient Root Query / Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Storage Commitment Push Model	1.2.840.10008.5.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.2.4.3 SOP Specific Conformance for Storage Commitment Push Model

The mechanisms available to get *DCMserver* to transfer SOP Instances are described in Section 3.2.1, 3.2.2 and 3.2.3.

3.2.4.3.1 Operations

Storage commitment requests are generated under the conditions described in Section 3.2.4.1.

DCMserver can request storage commitment for any SOP Instance in the local database.

The Transaction UID is applicable for the duration of the transaction, and there is no specific time limit imposed on receipt of the storage commitment result.

DCMserver does not perform extended negotiation for these SOP Classes and does not perform any validation of outgoing DICOM datasets. DCMserver does not support the optional Storage Media File-Set ID and UID attributes in the storage commitment request.

3.3 Association Acceptance by Real World Activity

DCMserver is association acceptance on the basis of Called AE Title, Calling AE Title and SOP Class UID matching.

3.3.1 Verification Association Request

3.3.1.1 Associated Real-World Activity

The *DCMserver* receives an association request for verification service from a remote AE.

3.3.1.2 Presentation Context Table

The following table lists the possible Presentation Contexts. The AE configuration file specifies which of these Presentation Contexts are actually used in a specific configuration.

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

3.3.1.3 SOP Specific Conformance for Verification

The *DCMserver* AE conforms to the DICOM Verification Service Class as an SCP. Extended negotiation is not supported.

A single response is generated for the request. If the association is successfully negotiated, a success status code of 0x0000 is always returned.

3.3.1.4 Presentation Context Acceptance Criterion

The *DCMserver* always accepts the Verification SOP Class. The possible Presentation Contexts are listed in section 3.3.1.2.

3.3.1.5 Transfer Syntax Selection Policies

The *DCMserver* supports only the default DICOM Little-endian Transfer Syntax.

3.3.2 Query Association Request

3.3.2.1 Associated Real-World Activity

The *DCMserver* searches the attached database for the requested Information Objects described in the C-FIND identifier and returns a response for each match.

3.3.2.2 Presentation Context Table

The following table lists the possible Presentation Contexts. The AE configuration file specifies which of these Presentation Contexts are actually used in a specific configuration.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Patient Root Query / Retrieve 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
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve 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
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.3.2.3 SOP Specific Conformance for Patient Root Query/Retrieve Model - FIND

The *DCMserver* AE conforms to the DICOM Patient Root Query/Retrieve Service Class as an SCP for the Abstract Syntax's listed in the table in section 3.3.2.2. The following tables define the accepted search keys.

Patient Level Keys for Patient Root Query/Retrieve Model

Description	Tag	Type
Patient's Name	0010,0010	R
Patient ID	0010,0020	R

Study Level Keys for Patient Root Query/Retrieve Model

Description	Tag	Type
Study Date	0008,0020	R
Study Time	0008,0030	R
Accession Number	0008,0050	R
Study ID	0020,0010	R
Study Instance UID	0020,000D	U
Referring Physician's Name	0008,0090	O

Series Level Keys for Patient Root Query/Retrieve Model

Description	Tag	Type
Modality	0008,0060	R
Series Number	0020,0011	R
Series Instance UID	0020,000E	U
Acquisition Type	0018,0023	O
Sequence	0018,0020	O
Sequence Name	0018,0024	O
Contrast Agent	0018,0010	O

Image Level Keys for Patient Root Query/Retrieve Model

Description	Tag	Type
SOP Instance UID	0008,0018	U

A response is returned for each match found in the attached database.
Possible response status values are:

Refused	Out of resources	A700
Failed	Unable to Process	C000
Cancel	Terminated due to Cancel Request	FE00
Success	matching completed	0000
Pending	Matches are continuing	FF00

The attribute 0x00000902 contains a descriptive message to explain error returns.

3.3.2.4 SOP Specific Conformance for Study Root Query/Retrieve Model - FIND

The *DCMserver* AE conforms to the DICOM Study Root Query/Retrieve Service Class as an SCP for the Abstract Syntax's listed in the table in section 3.3.2.2. The following tables define the accepted search keys.

Study Level Keys for Study Root Query/Retrieve Model

Description	Tag	Type
Study Date	0008,0020	R
Study Time	0008,0030	R
Accession Number	0008,0050	R
Patient's Name	0010,0010	R
Patient ID	0010,0020	R
Study ID	0020,0010	R
Study Instance UID	0020,000D	U
Referring Physician's Name	0008,0090	O

Series Level Keys for Study Root Query/Retrieve Model

Description	Tag	Type
Modality	0008,0060	R
Series Number	0020,0011	R
Series Instance UID	0020,000E	U
Acquisition Type	0018,0023	O
Sequence	0018,0020	O
Sequence Name	0018,0024	O
Contrast Agent	0018,0010	O

Image Level Keys for Study Root Query/Retrieve Model

Description	Tag	Type
SOP Instance UID	0008,0018	U

A response is returned for each match found in the attached database.
Possible response status values are:

Refused	Out of resources	A700
Failed	Unable to Process	C000
Cancel	Terminated due to Cancel Request	FE00
Success	matching completed	0000
Pending	Matches are continuing	FF00

The attribute 0x00000902 contains a descriptive message to explain error returns.

3.3.2.5 Presentation Context Acceptance Criterion

The *DCMserver* accepts SOP Class contexts if they are configured in the AE configuration file. The possible Presentation Contexts are listed in section 3.3.2.2.

3.3.2.6 Transfer Syntax Selection Policies

The *DCMserver* supports the default DICOM Little-endian Transfer Syntax.

3.3.3 Move Association Request

3.3.3.1 Associated Real-World Activity

The *DCMserver* initiates an association to the destination AE specified in the C-MOVE command message. The *DCMserver* then extracts the requested Information Objects described in the C-MOVE identifier from the attached database and performs C-STORE operations on the destination association.

3.3.3.2 Presentation Context Table

The following table lists the possible Presentation Contexts. The AE configuration file specifies which of these Presentation Contexts are actually used in a specific configuration.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Patient Root Query / Retrieve 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
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Study Root Query / Retrieve 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
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.3.3.3 SOP Specific Conformance for Patient Root Query/Retrieve Model - MOVE

The *DCMserver* AE conforms to the DICOM Patient Root Query/Retrieve Service Class as an SCP for the Abstract Syntax's listed in the table in section 3.3.3.2.

A response is returned for each Information Object sent to the destination AE
Possible response status values are:

Refused	Out of resources	A700
	Move Destination Unknown	A801
Failed	Unable to Process	C000
Cancel	Terminated due to Cancel Request	FE00
Success	sub-operations completed	0000
Warning	sub-operations completed, 1 or more failures	B000
Pending	Matches are continuing	FF00

The attribute 0x00000902 contains a descriptive message to explain error returns.

3.3.3.4 SOP Specific Conformance for Study Root Query/Retrieve Model - MOVE

The *DCMserver* AE conforms to the DICOM Study Root Query/Retrieve Service Class as an SCP for the Abstract Syntax's listed in the table in section 3.3.3.2.

A response is returned for each Information Object sent to the destination AE.
Possible response status values are:

Refused	Out of resources	A700
	Move Destination Unknown	A801
Failed	Unable to Process	C000
Cancel	Terminated due to Cancel Request	FE00
Success	sub-operations completed	0000
Warning	sub-operations completed, 1 or more failures	B000
Pending	Matches are continuing	FF00

The attribute 0x00000902 contains a descriptive message to explain error returns.

3.3.3.5 Presentation Context Acceptance Criterion

The *DCMserver* accepts SOP Class contexts if they are configured in the AE configuration file. The possible Presentation Contexts are listed in section 3.3.3.2.

3.3.3.6 Transfer Syntax Selection Policies

The *DCMserver* supports the default DICOM Little-endian Transfer Syntax.

3.3.4 Storage Association Request

3.3.4.1 Associated Real-World Activity

The *DCMserver* receives an association request for storage service from a remote AE.
The *DCMserver* stores image Information Object Instances received on the accepted association into the database of the Hitachi MR Imaging System.

3.3.4.2 Presentation Context Table

The following table lists the possible Presentation Contexts. The AE configuration file specifies which of these Presentation Contexts are actually used in a specific configuration.

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.3.4.3 SOP Specific Conformance for SOP Class Storage

The *DCMserver* AE conforms to the DICOM Storage Service Class as an SCP for the Abstract Syntax's listed in the table in section 3.3.4.2 at conformance level 2. Storage Conformance level 2 requires the AE to retain all Type 1, Type 2 and Type 3 attributes. Annex A of this document specifies the attributes retained from the Storage SOP Class Information Objects listed in section 3.3.4.2.

The received Information Object Instance is stored in a database until the user of Hitachi MR Imaging System causes the data to be deleted. The Hitachi MR Imaging System's GUI application accesses the stored data for display.

Private attributes which are not recognized as valid Hitachi MR Imaging System's private attribute sets are discarded.

A response is returned for each Information Object received from the Storage SCU.
Possible response status values are:

Refused	Out of resources	A701
Failed	Identifier does not match SOP Class	A900
	Unable to Process	C001
Success	sub-operations completed	0000

The attribute 0x00000902 contains a descriptive message to explain error returns.

Failure of a validation results in the return of status C001 in the C-STORE response message.

3.3.4.4 Presentation Context Acceptance Criterion

The *DCMserver* accepts Storage SOP Class Presentation Contexts if they are configured in the AE configuration file. The possible Presentation Contexts are listed in section 3.3.4.2.

3.3.4.5 Transfer Syntax Selection Policies

The *DCMserver* supports the default DICOM Little-endian Transfer Syntax.

3.3.5 Storage Commitment Association Request

3.3.5.1 Associated Real-World Activity

The *DCMserver* receives an association request from a Storage Commitment SCP that did not respond to a Storage Commitment request from the *DCMserver* on the original association.

3.3.5.2 Presentation Context Table

The following table lists the possible Presentation Contexts. The AE configuration file specifies which of these Presentation Contexts are actually used in a specific configuration.

Presentation Contexts Accepted for Storage Commitment Association Request

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Storage Commitment Push Model	1.2.840.10008.5.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	SCU/SCP Role Selection
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

3.3.5.3 SOP Specific Conformance for SOP Class - Storage Commitment Push as SCU

3.3.5.3.1 Operations

A single response is returned for the Storage Commitment response from the Storage Commitment SCP.
Possible response status values are:

Success	Operation completed	0x0000
Fail	Unable to Process	0x0110
	Identifier does not match SOP Class	0x0118

3.3.5.3.2 Notifications

DCMserver generates a storage commitment result once it has updated, successfully or not, the database records for the SOP Instance(s) that were committed.

DCMserver does not support the optional Storage Media File-Set ID and UID attributes nor the optional Retrieve AETitle attribute in the storage commitment result.

3.3.5.4 Presentation Context Acceptance Criterion

The *DCMserver* accepts Storage Commitment SOP Class Presentation Contexts if they are configured in the AE configuration file. The possible Presentation Contexts are listed in section 3.3.5.2.

3.3.5.5 Transfer Syntax Selection Policies

The *DCMserver* supports the default DICOM Little-endian Transfer Syntax.

4. Print Application Entity Specifications

The Hitachi MR Imaging System's DICOM Print capability (*DCMserver*) consists of only a SCU component. The SCU portion originates associations for printing operations.

The *DCMserver* AE provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

Print Management Meta SOP Class UID

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18

4.1 Association Establishment Policies

4.1.1 General

The Hitachi MR Imaging System's GUI supports more than one DICOM capable imager. The *DCMserver* configuration file contains the configuration parameters such as host name, port number and AE title for that AE.

The *DCMserver* maintains a separate association with each DICOM SCP. It releases the association with the DICOM SCP if no operation is done on the association in a selected time period.

4.1.2 Number of Associations

The *DCMserver* is capable of initiating single association for point application.

4.1.3 Asynchronous Nature

The *DCMserver* does not support multiple outstanding transactions.

4.2 Association Initiation by Real World Activity

This section details the action of the *DCMserver* as a result of user initiated activity on the Hitachi MR Imaging System's GUI.

4.2.1 Print Request

4.2.1.1 Associated Real World Activity

The user of the Hitachi MR Imaging System selects the Print operation on the user interface.

4.2.1.2 Proposed Presentation Contexts

The following table describes the Presentation Contexts that may be presented for the Print request.
The configuration file contains 1 of the listed Abstract Syntax's.

Presentation Context Table for Print Request

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Basic Grayscale Print Management Meta	1.2.840.10008.5.1.1.9	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
Basic Color Print Management Meta	1.2.840.10008.5.1.1.18	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

4.2.1.3 SOP Specific Conformance for Basic Grayscale/Color Print Management Meta

The *DCMserver* supports the following mandatory SOP classes which are defined under the Basic Grayscale Print/Color Management Meta SOP Class:

Print Management SOP Class UID

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
Basic Color Image Box	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

The *DCMserver* supports the following mandatory and optional SOP class attributes and DIMSE services for the Basic Grayscale Print Management Meta SOP Class and Basic Color Print Management Meta SOP Class.

Print Management DIMSE Services

SOP Class	DIMSE Service	Optional Attribute	Tag
Basic Film Session SOP Class	N-CREATE	Number of Copies	2000,0010
		Print Priority	2000,0020
		Medium Type	2000,0030
		Film Destination	2000,0040
		Film Session Label	2000,0050
		Memory Allocation	2000,0060
Basic Film Box SOP Class	N-CREATE	Image Display Format	2010,0010
		Referenced Film Session Sequence	2010,0500
		>Referenced SOP Class UID	0008,1150
		>Referenced SOP Instance UID	0008,1155
		Referenced Presentation LUT Sequence	2050,0500
		>Referenced SOP Class UID	0008,1150
		>Referenced SOP Instance UID	0008,1155
		Film Orientation	2010,0040
		Film Size ID	2010,0050
		Magnification Type	2010,0060
		Max Density	2010,0130
		Configuration Information	2010,0150
		Smoothing Type	2010,0080
		Border Density	2010,0100
		Empty Image Density	2010,0110
		Min Density	2010,0120
		Trim	2010,0140
		Illumination	2010,015E
		Reflected Ambient Light	2010,0160
	N-ACTION		
	N-DELETE		

SOP Class	DIMSE Service	Optional Attribute	Tag
Basic Grayscale Image Box SOP Class	N-SET	Image Position	2020,0010
		Polarity	2020,0020
		Magnification type	2010,0060
		Smoothing type	2010,0080
		Requested Image Size	2020,0030
		Basic Grayscale Image Sequence	2020,0110
		>Samples Per Pixel	0028,0002
		>Photometric Interpretation	0028,0004
		>Rows	0028,0010
		>Columns	0028,0011
		>Pixel Aspect Ratio	0028,0034
		>Bits Allocated	0028,0100
		>Bits Stored	0028,0101
		>High Bit	0028,0102
		>Pixel Representation	0028,0103
		>Pixel Data	7FE0,0010
Printer SOP Class	N-EVENT-REPORT	Printer Status Info	2110,0020
	N-GET	Printer Status	2110,0010
		Printer Status Info	2110,0020
		Printer Name	2110,0030
		Manufacturer	0008,0070
		Manufacturer Model Name	0008,1090
		Device Serial Number	0018,1000
		Software Versions	0018,1020
Basic Color Image Box SCP Class	N-SET	Image Position	2020,0010
		Polarity	2020,0020
		Magnification type	2010,0060
		Smoothing type	2010,0080
		Requested Image Size	2020,0030
		Basic Color Image Sequence	2020,0111
		>Samples Per Pixel	0028,0002
		>Photometric Interpretation	0028,0004
		>Rows	0028,0010
		>Columns	0028,0011
		>Pixel Aspect Ratio	0028,0034
		>Bits Allocated	0028,0100
		>Bits Stored	0028,0101
		>High Bit	0028,0102
		>Pixel Representation	0028,0103
		>Pixel Data	7FE0,0010

4.3 Association Acceptance by Real World Activity

The *DCMserver* does not accept association requests.

5. Modality Worklist Application Entity Specifications

The *DCMserver* of the Hitachi MR Imaging System is capable of providing Standard Conformance to the following DICOM V3.0 SOP Classes as SCU:

Modality Worklist SOP Class UID

SOP Class Name	SOP Class UID
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31

5.1 Association Establishment Policies

5.1.1 General

When *DCMserver* issues a request to retrieve a Modality Worklist, it initiates an Association to the Modality Worklist SCP. *DCMserver* assumes the maximum PDU length to be 16384 bytes.

5.1.2 Number of Associations

DCMserver can initiate single association for Modality Worklist. When *DCMserver* has retrieved a Modality Worklist from a Modality Worklist SCP, *DCMserver* releases the Association to the Modality Worklist SCP.

5.1.3 Asynchronous Nature

DCMserver will allow only one pending C-FIND request per Association. Therefore, *DCMserver* will not support asynchronous operations and will not perform asynchronous window negotiation.

5.2 Association Initiation by Real World Activity

This section details the action of the *DCMserver* as a result of user initiated activity on the Hitachi MR Imaging System's GUI.

5.2.1 Modality Worklist Retrieval Request

5.2.1.1 Associated Real-World Activity

When the user of the Hitachi MR Imaging System issues a request to retrieve a Modality Worklist, *DCMserver* initiates an Association to the Modality Worklist SCP. The Hitachi MR Imaging System's GUI also issues a request automatically in order to retrieve a specific Worklist when the user starts scheduled procedures.

5.2.1.2 Proposed Presentation Context

The following table describes the Presentation Contexts that are presented for the FIND request.

Presentation Context Table for Establishing Modality Worklist Association

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

5.2.1.3 SOP Specific Conformance for Modality Worklist Information Model - FIND

The *DCMserver* supports the following search keys as SCU.

Search Keys for Modality Worklist Information Model - FIND

Attribute Name	Tag	Type	User Configurable
Scheduled Station AE Title	0040, 0001	R	Yes
Scheduled Procedure Step Start Date	0040, 0002	R	Yes
Modality	0008, 0060	R	Yes
Patient ID	0010, 0020	R	Yes
Accession Number	0008, 0050	O	Yes
Study Instance UID	0020, 000D	O	No

5.3 Association Acceptance by Real World Activity

The *DCMserver* does not accept association requests.

6. MPPS Entity Specifications

The *DCMserver* of the Hitachi MR Imaging System is capable of providing Standard Conformance to the following DICOM V3.0 SOP Classes as SCU:

Modality Worklist SOP Class UID

SOP Class Name	SOP Class UID
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

6.1 Association Establishment Policies

6.1.1 General

DCMserver initiates an Association to the MPPS SCP in response to a user of Hitachi MR Imaging System request to create or update an MPPS or to an automatic creation of an caused by initiation of image creation. When *DCMserver* has created or set an MPPS to the MPPS SCP, *DCMserver* releases the Association to the MPPS SCP.

6.1.2 Number of Associations

DCMserver can initiate single association for MPPS.

6.1.3 Asynchronous Nature

The *DCMserver* will allow only one pending request on an Association (being it N-CREATE or N-SET). Therefore, *DCMserver* will not support DICOM asynchronous operations and will not perform asynchronous window negotiation.

6.2 Association Initiation by Real World Activity

This section details the action of the *DCMserver* as a result of user initiated activity on the Hitachi MR Imaging System's GUI.

6.2.1 MPPS Association Request

6.2.1.1 Associated Real-World Activity

When the user of the Hitachi MR Imaging System issues a request to create or update an MPPS, *DCMserver* initiates an Association to the MPPS SCP.

The Hitachi MR Imaging System issues a request automatically in order to create an MPPS when the user starts scheduled procedures. The Hitachi MRI system also issues a request automatically in order to update an MPPS when the user finishes the scheduled procedures.

6.2.1.2 Proposed Presentation Context

The following table lists the Presentation Contexts offered to the MPPS SCP at the time the Association is established. The *DCMserver* does not negotiate SCU/SCP Role Selection and assumes SCU.

Presentation Context Table for Establishing MPPS Association

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name**	**UID**		
Modality Performed Procedure Step Model	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

6.3 Association Acceptance by Real World Activity

The *DCMserver* does not accept association requests.

7. Media Storage Application Entity Specification

The *DCMserver* AE provides Standard Conformance to DICOM Interchange option of the Media Storage Service Class. The Application Profiles and Roles are listed in the following table:

Application Profiles Supported

Application Profiles Supported	Real World Activity	Role	Service Class Option
STD-CTMR-DVD	Create	FSC	Interchange
	Store	FSU	Interchange
	Query	FSR	Interchange
	Retrieve	FSR	Interchange
STD-CTMR-CD	Write to CD-R	FSC	Interchange
	Query	FSR	Interchange
	Retrieve	FSR	Interchange

[DVD]
The *DCMserver* will support DVD-R/DVD+R 4.7GB media type as long as the media is formatted according to DICOM specification in PS 3.12.

[CD-R]
The *DCMserver* writes DICOM file-set (single DICOMDIR and zero or more DICOM files) to CD-R media. The *DCMserver* supports CD-R 650MB.

SOP Classes Supported

Application Profiles	SOP Class Name	SOP Class UID
STD-CTMR-DVD	MR Image Storage	1.2.840.10008.5.1.4.1.1.4
	Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
	SC Image Storage	1.2.840.10008.5.1.4.1.1.7
STD-CTMR-CD	MR Image Storage	1.2.840.10008.5.1.4.1.1.4
	Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
	SC Image Storage	1.2.840.10008.5.1.4.1.1.7

Transfer Syntaxes Supported for reading of SOP instances

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

Transfer Syntaxes Supported for storage of SOP instances

Transfer Syntax Name	Transfer Syntax UID
Explicit VR Little Endian	1.2.840.10008.1.2.1

7.1 File Meta Information for the Application Entity

The *DCMserver* AE Title is configurable.

7.2 Real World Activities for this Application Entity

7.2.1 Real World Activity : Create

The *DCMserver* acts as an FSC using the interchange option when requested to create.
When the DCMserver is requested to Create, it will create the DICOM file-set (DICOMDIR).

7.2.1.1 Application Profiles for the RWA : Create

For the list of application profiles that invoke this AE for the Initialize Media, see the table named "**Application Profiles Supported**" in section 7.

7.2.2 Real World Activity : Query

The *DCMserver* acts as an FSR using the interchange option when requested to Query.
When the *DCMserver* is requested to Query, it will read the DICOM file-set (DICOMDIR) and display the record entries according to the user query. The *DCMserver* will only return records that match the Hitachi MR Imaging System's application query.

7.2.2.1 Application Profiles for the RWA : Query

For the list of application profiles that invoke this AE for the Query, see the table named "**Application Profiles Supported**" in section 7.

7.2.3 Real World Activity : Retrieve

The DCMserver acts as an FSR using the interchange option when retrieve from the media to local database.
The DCMserver will copy any SOP instance selected from a media directory list from the media to local database upon request. The DCMserver will only copy any SOP instance that matches the user query to local database.

7.2.3.1 Application Profiles for the RWA : Retrieve

For the list of application profiles that invoke this AE for the Retrieve, see the table named "**Application Profiles Supported**" in section 7.

7.2.4 Real World Activity : Store

The DCMserver acts as an FSU using the interchange option when requested to store a media.
The DCMserver will take the select list of SOP instances and eliminate any SOP instance not belonging to the SOP Class listed in the table named "**SOP Classes Supported**" in section 7.

7.2.4.1 Application Profiles for the RWA : Store

For the list of application profiles that invoke this AE for the Store, see the table named "**Application Profiles Supported**" in section 7.

7.2.5 Real World Activity : Write to CD-R

The *DCMserver* acts as an FSC using the interchange option when requested to archive a Patient data to
CD-R media.
The *DCMserver* will take the select list of SOP instances and eliminate any SOP instance not belonging to the SOP Class listed in the table named "**SOP Classes Supported**" in section 7. The remaining SOP instances are written to the media.

7.2.5.1 Application Profiles for the RWA : Write to CD-R

For the list of application profiles that invoke this AE for the Write to CD-R, see the table named "**Application Profiles Supported**" in section 7.

8. Communication Profiles

8.1 Supported Communication Stacks (Parts 8,9)

The TCP/IP Network Communication Support as defined in DICOM Part 8 is supported.

8.1.1 OSI Stack

The OSI stack is not supported.

8.1.2 TCP/IP Stack

8.1.2.1 API

The *DCMserver* use Berkeley style sockets.

8.1.2.2 Physical Media Support

The Hitachi MR Imaging System supports a single 10 BASE-T/100 BASE-TX/1000 BASE-T Ethernet connection.
The *DCMserver* are not dependent on the physical medium used for the TCP/IP network other than its effect on performance.

8.1.3 Point-to-Point Stack

Not supported.

9. Extensions/Specialization's/Privatization's

9.1 Standard/Extended/Specialized/Private SOPs

Following is a list of additional term for Body Part Examined (0018,0015).

Applied values:

ADVASCULAR
ANKLE
BRACHIALPLEXUS
BRAIN
BREAST
CHEST
CHVASCULAR
CSPINE
ELBOW
FEMALEPELVIS
FINGER
FOOT
FOREARM
GENERALABDOME
GENERALPELVIS
HAND
HEART
HIP
HNVASCULAR
IAC
JAW
KIDNEY
KNEE
LIVER
LOWERLEG
LSPINE
LWVASCULAR
MALEPELVIS
NECK
ORBITS
PITUITARY
PVVASCULAR
SHOULDER
SINUS
SPVASCULAR
SSPINE
THYROID
TOE
TSPINE
UPPERARM

UPPERLEG
UPVASCULAR
WHOLEBODY
WRIST

9.2 Private Transfer Syntax's

Not applicable.

9.3 SOP Class Extension

9.3.1 *DCMserver* SOP Class Extension

The supported SOP classes have been extended to provide support for private attributes.

10. Security Profiles

10.1 Image Transfer and Storage Commitment Security Profile

DCMserver provides conformance to the following Security Profiles defined in PS3.15.

10.1.1 Basic TLS Secure Transport Connection Profile

DCMserver accepts and initiates TLS connections from/to an AE Title when is configured to do so.

As an Association Acceptor, *DCMserver* always asks for the Association Requestor's certificate when security is enabled, if this is set and a valid certificate is not presented, the TLS connection request is denied.
If during an exchange of DICOM data, *DCMserver* detects message tampering through an integrity check failure, the Association is aborted. The provider reason will be REASON-NOT-SPECIFIED as defined by DICOM in PS3.8; an implementation-specific reason may be used in a future version of *DCMserver.*

DCMserver supports the following features of the Basic TLS Secure Transport Profile:
- support for the profile can be enabled or disabled for each DICOM SCU instantiation
- TLS_RSA_WITH_3DES_EDE_CBC_SHA, TLS_RSA_WITH_AES_128_CBC_SHA and TLS_RSA_WITH_NULL_SHA cipher suites
- X.509 certificate in PEM format
- private key in PEM format
- certificates of trusted CAs in PEM format

10.2 Print security profile

DCMserver provides conformance to the following Security Profiles defined in PS3.15.

10.2.1 Basic TLS Secure Transport Connection Profile

DCMserver supports the following features of the Basic TLS Secure Transport Profile:
- support for the profile can be enabled or disabled for each DICOM SCU instantiation
- TLS_RSA_WITH_3DES_EDE_CBC_SHA, TLS_RSA_WITH_AES_128_CBC_SHA and TLS_RSA_WITH_NULL_SHA cipher suites
- X.509 certificate in PEM format
- private key in PEM format
- certificates of trusted CAs in PEM format

10.3 MWL security profile

DCMserver provides conformance to the following Security Profiles defined in PS3.15.

10.3.1 Basic TLS Secure Transport Connection Profile

The *DCMserver* supports the following features of the Basic TLS Secure Transport Profile:

- support for the profile can be enabled or disabled
- TLS_RSA_WITH_3DES_EDE_CBC_SHA, TLS_RSA_WITH_AES_128_CBC_SHA and TLS_RSA_WITH_NULL_SHA cipher suites
- X.509 certificate in PEM format
- private key in PEM format
- certificates of trusted CAs in PEM format

10.4 MPPS security profile

DCMserver provides conformance to the following Security Profiles defined in PS3.15.

10.4.1 Basic TLS Secure Transport Connection Profile

DCMserver supports the following features of the Basic TLS Secure Transport Profile:

- support for the profile can be enabled or disabled
- TLS_RSA_WITH_3DES_EDE_CBC_SHA, TLS_RSA_WITH_AES_128_CBC_SHA and TLS_RSA_WITH_NULL_SHA cipher suites
- X.509 certificate in PEM format
- private key in PEM format
- certificates of trusted CAs in PEM format

11. Configuration

11.1 AE Title/Presentation Address Mapping

The *DCMserver* AE maps AE Titles to host names and port numbers via lookups in the configuration file.

11.2 Configurable Parameters

DCMserver have the following configurable pamamenters.

- AE title, host name, IP address, alias, description and port number of the *DCMserver*
- AE title, host name, IP address, alias, description and port number of remote AEs
- TCP/IP connection timeout
- If private attributes are imported and exported
- Enable/disable Security Profile
- Cipher suites for the secure communications
- Minimam density and Maximum density for DICOM Print
- Supported media types and media sizes for DICOM Print
- Number of copies for DICOM Print
- Enable/disable Presentation LUT for DICOM Print

12. Support of Extended Character Sets

Following extended character sets are supported.

- ISO-IR 6: Default character set
- ISO-IR 13: Japanese katakana (phonetic) characters (94 characters, 1-byte)
- ISO-IR 87: Japanese kanji (ideographic), hiragana (phonetic), and katakana (phonetic) characters (94^2 characters, 2-byte)
- ISO-IR 100: Latin alphabet No. 1 characters (191 characters, 1-byte)

DM# 110979 V2

13. Annex A

This annex details the common Information Object Definitions content transmitted and /or stored by the *DCMserver* AE. They contain Type 1, Type 2 and Type 3 attributes for Level 2 conformance defined in
DICOM Part 3, Information Object Definitions PS3.3.
When the received image from outside through a network or media is transferred again, Type 3 tag which are not included in original data are not sent to destination.

13.1 Common Modules

Patient Module Attributes

Attribute Name	Tag	Type
Patient's Name	0010,0010	2
Patient ID	0010,0020	2
Issuer of Patient ID	0010,0021	3
Patient's Birth Date	0010,0030	2
Patient's Birth Time	0010,0032	3
Patient's Sex	0010,0040	2
Other Patient IDs	0010,1000	3
Other Patient Names	0010,1001	3
Ethnic Group	0010,2160	3
Patient Comments	0010,4000	3

Patient Identification Module Attributes

Attribute Name	Tag	Type
Issuer of Patient ID	0010,0021	3
Patient's Mother's Birth Name	0010,1060	3
Medical Record Locator	0010,1090	3

Patient Demographic Module Attributes

Attribute Name	Tag	Type
Patient's Address	0010,1040	3
Military Rank	0010,1080	3
Branch of Service	0010,1081	3
Country of Residence	0010,2150	3
Region of Residence	0010,2152	3
Patient's Telephone Numbers	0010,2154	3
Patient's Religious Preference	0010,21F0	3

Patient Medical Module Attributes

Attribute Name	Tag	Type
Medical Alerts	0010,2000	3
Contrast Allergies	0010,2110	3
Smoking Status	0010,21A0	3
Pregnancy Status	0010,21C0	3

General Study Module Attributes

Attribute Name	Tag	Type
Study Instance UID	0020,000D	1
Study ID	0020,0010	2
Study Date	0008,0020	2
Study Time	0008,0030	2
Accession Number	0008,0050	2
Referring Physician's Name	0008,0090	2
Referring Physician Identification Sequence	0008,0096	3
Study Description	0008,1030	3
Procedure Code Sequence	0008,1032	3
Physician of Record	0008,1048	3
Physician(s) of Record Identification Sequence	0008,1049	3
Name of Physician Reading Study	0008,1060	3
Physician(s) Reading Study Identification Sequence	0008,1062	3
Referenced Study Sequence	0008,1110	3

Patient Study Module Attributes

Attribute Name	Tag	Type
Patient's Age	0010,1010	3
Patient's Size	0010,1020	3
Patient's Weight	0010,1030	3
Occupation	0010,2180	3
Additional Patient's History	0010,21B0	3
Admitting Diagnoses Description	0008,1080	3
Admitting Diagnosis Code Sequence	0008,1084	3

General Series Module Attributes

Attribute Name	Tag	Type
Modality	0008,0060	1
Series Instance UID	0020,000E	1
Series Number	0020,0011	2
Patient Position	0018,5100	2C
Laterality	0020,0060	2C
Series Date	0008,0021	3
Series Time	0008,0031	3
Series Description	0008,103E	3
Performing Physicians' Name	0008,1050	3
Operators' Name	0008,1070	3
Referenced Performed Procedure Step Sequence	0008,1111	3
Body Part Examined	0018,0015	3
Protocol Name	0018,1030	3
Patient Position FFS	0018,5100	2C
Smallest Pixel Value in Series	0028,0108	3
Largest Pixel Value in Series	0028,0109	3
Performed Procedure Step Start Date	0040,0244	3
Performed Procedure Step Start Time	0040,0245	3
Performed Procedure Step ID	0040,0253	3
Performed Procedure Step Description	0040,0254	3
Performed Protocol Code Sequence	0040,0260	3
Request Attributes Sequence	0040,0275	3
Comments on the Performed Procedure Step	0040,0280	3

Frame of Reference Module Attributes

Attribute Name	Tag	Type
Frame of Reference UID	0020,0052	1
Position Reference Indicator	0020,1040	2

General Equipment Module Attributes

Attribute Name	Tag	Type
Manufacturer	0008,0070	2
Institution Name	0008,0080	3
Institution Address	0008,0081	3
Station Name	0008,1010	3
Institutional Department Name	0008,1040	3
Manufacturer's Model Name	0008,1090	3
Device Serial Number	0018,1000	3
Software Versions	0018,1020	3
Spatial Resolution	0018,1050	3
Date of Last Calibration	0018,1200	3
Time of Last Calibration	0018,1201	3
Pixel Padding Value	0028,0120	3

General Image Module Attributes

Attribute Name	Tag	Type
Instance Number	0020,0013	2
Patient Orientation	0020,0020	2C
Content Date	0008,0023	2C
Content Time	0008,0033	2C
Image Type	0008,0008	3
Referenced Image Sequence	0008,1140	3
> Referenced SOP Class UID	0008,1150	1
> Referenced SOP Instance UID	0008,1155	1
Acquisition Number	0020,0012	3
Acquisition Date	0008,0022	3
Acquisition Time	0008,0032	3
Images in Acquisition	0020,1002	3
Image Comments	0020,4000	3
Lossy Image Compression	0028,2110	3
Presentation LUT Shape	2050,0020	3

Image Plane Module Attributes

Attribute Name	Tag	Type
Image Position (Patient)	0020,0032	1
Image Orientation (Patient)	0020,0037	1
Pixel Spacing	0028,0030	1
Slice Thickness	0018,0050	2
Slice Location	0020,1041	3

Image Pixel Module Attributes

Attribute Name	Tag	Type
Samples per Pixel	0028,0002	1
Photometric Interpretation	0028,0004	1
Rows	0028,0010	1
Columns	0028,0011	1
Bits Allocated	0028,0100	1
Bits Stored	0028,0101	1
High Bit	0028,0102	1
Pixel Representation	0028,0103	1
Pixel Data	7FE0,0010	1
Planar Configuration	0028,0006	1C
Pixel Aspect Ratio	0028,0034	1C
Smallest Image Pixel Value	0028,0106	3
Largest Image Pixel Value	0028,0107	3
Red Palette Color Lookup Table Descriptor	0028,1101	3
Green Palette Color Lookup Table Descriptor	0028,1102	3
Blue Palette Color Lookup Table Descriptor	0028,1103	3
Red Palette Color Lookup Table Data	0028,1201	3
Green Palette Color Lookup Table Data	0028,1202	3
Blue Palette Color Lookup Table Data	0028,1203	3

Contrast/Bolus Module Attributes

Attribute Name	Tag	Type
Contrast/Bolus Agent	0018,0010	2
Contrast/Bolus Agent Sequence	0018,0012	3
Contrast/Bolus Administration Route Sequence	0018,0014	3
Additional Drug Sequence	0018,002A	3
Contrast/Bolus Volume	0018,1041	3
Contrast/Bolus Start Time	0018,1042	3
Contrast/Bolus Stop Time	0018,1043	3
Contrast/Bolus Total Dose	0018,1044	3
Contrast Flow Rate	0018,1046	3
Contrast Flow Duration	0018,1047	3
Contrast/Bolus Ingredient	0018,1048	3
Contrast/Bolus Ingredient Concentration	0018,1049	3

VOI LUT Module Attributes

Attribute Name	Tag	Type
Window Center	0028,1050	3
Window Width	0028,1051	1C
Window Center & Width Explanation	0028,1055	3
VOI LUT Sequence	0028,3110	3

SOP Common Module Attributes

Attribute Name	Tag	Type
Specific Character Set	0008,0005	1
Instance Creation Date	0008,0012	1
Instance Creation Time	0008,0013	1
SOP Class UID	0008,0016	1
SOP Instance UID	0008,0018	1

13.2 MR Image Modules

MR Image Module Attributes

Attribute Name	Tag	Type
Image Type	0008,0008	1
Bits Allocated	0028,0100	1
Scanning Sequence	0018,0020	1
Sequence Variant	0018,0021	1
Samples per Pixel	0028,0002	1
Photometric Interpretation	0028,0004	1
Scan Options	0018,0022	2
MR Acquisition Type	0018,0023	2
Repetition Time	0018,0080	2C
Echo Time	0018,0081	2
Echo Train Length	0018,0091	2
Inversion Time	0018,0082	2C
Trigger Time	0018,1060	2C
Sequence Name	0018,0024	3
Angio Flag	0018,0025	3
Number of Averages	0018,0083	3
Imaging Frequency	0018,0084	3
Imaged Nucleus	0018,0085	3
Echo Number	0018,0086	3
Magnetic Field Strength	0018,0087	3
Spacing Between Slices	0018,0088	3
Number of Phase Encoding Steps	0018,0089	3
Percent Sampling	0018,0093	3
Percent Phase Field of View	0018,0094	3
Pixel Bandwidth	0018,0095	3
Normal Interval	0018,1062	3
Beet Rejection Flag	0018,1080	3
Low R-R Value	0018,1081	3
High R-R Value	0018,1082	3
Intervals Acquired	0018,1083	3
Intervals Rejected	0018,1084	3
PVC Rejection	0018,1085	3
Skip Beats	0018,1086	3
Heart Rate	0018,1088	3
Trigger Time	0018,1060	2C
Cardiac Number of Images	0018,1090	3
Trigger Window	0018,1094	3
Reconstruction Diameter	0018,1100	3
Receive Coil Name	0018,1250	3
Transmit Coil Name	0018,1251	3
Acquisition Matrix	0018,1310	3
In-plane Phase Encoding Direction	0018,1312	3
Flip Angle	0018,1314	3

Attribute Name	Tag	Type
SAR	0018,1316	3
Variable Flip Angle Flag	0018,1315	3
dB/dt	0018,1318	3
Temporal Position Identifier	0020,0100	3
Number of Temporal Positions	0020,0105	3
Temporal Resolution	0020,0110	3
Samples per Pixel	0028,0002	1
Photometric Interpretation	0028,0004	1
Bits Allocated	0028,0100	1
Anatomic Region Sequence	0008,2218	3
Primary Anatomic Structure Sequence	0008,2228	3
B1rms	0018,1320	3

Additional Attributes Module

Attribute Name	Tag	Type
Content Qualification	0018,9004	3
Number of k-Space Trajectories	0018,9093	3
Saturation Recovery	0018,9024	3
Geometry of k-Space Traversal	0018,9032	3
Rectilinear Phase Encode Reordering	0018,9034	3
Number of Frames	0028,0008	3
Frame Increment Pointer	0028,0009	3
Burned In Annotation	0028,0301	3
Rescale Intercept	0028,1052	3
Rescale Slope	0028,1053	3
Rescale Type	0028,1054	3
Shared Functional Groups Sequence	5200,9229	3
> MR Spatial Saturation Sequence	0018,9107	3
>> Slab Thickness	0018,9104	3
>> Slab Orientation	0018,9105	3
>> Mid Slab Position	0018,9106	3
> MR Receive Coil Sequence	0018,9042	3
>> Multi-Coil Definition Sequence	0018,9045	3
>>> Multi-Coil Element Name	0018,9047	3
>>> Multi-Coil Element Used	0018,9048	3
> MR Modifier Sequence	0018,9115	3
>> Spoiling	0018,9016	3
>> T2 Preparation	0018,9021	3
>> Spectrally Selected Excitation	0018,9026	3
>> Parallel Reduction Factor In-plane	0018,9069	3
>> Parallel Acquisition	0018,9077	3
>> Inversion Times	0018,9079	3
>> Parallel Reduction Factor out-of-plane	0018,9155	3
> MR Diffusion Sequence	0018,9117	3
>> Diffusion Directionality	0018,9075	3
>> Diffusion Gradient Direction Sequence	0018,9076	3
>>> Diffusion Gradient Orientation	0018,9089	3
>>> Private Tag	0029,101F	3

Attribute Name	Tag	Type
>> Diffusion b-value	0018,9087	3
>> Diffusion Anisotropy Type	0018,9147	3
Per-Frame Functional Groups Sequence	5200,9230	3
> MR Spatial Saturation Sequence	0018,9107	3
>> Slab Thickness	0018,9104	3
>> Slab Orientation	0018,9105	3
>> Mid Slab Position	0018,9106	3
> MR Receive Coil Sequence	0018,9042	3
>> Multi-Coil Definition Sequence	0018,9045	3
>>> Multi-Coil Element Name	0018,9047	3
>>> Multi-Coil Element Used	0018,9048	3
> MR Modifier Sequence	0018,9115	3
>> Spoiling	0018,9016	3
>> T2 Preparation	0018,9021	3
>> Spectrally Selected Excitation	0018,9026	3
>> Parallel Reduction Factor In-plane	0018,9069	3
>> Parallel Acquisition	0018,9077	3
>> Inversion Times	0018,9079	3
>> Parallel Reduction Factor out-of-plane	0018,9155	3
> MR Diffusion Sequence	0018,9117	3
>> Diffusion Directionality	0018,9075	3
>> Diffusion Gradient Direction Sequence	0018,9076	3
>>> Diffusion Gradient Orientation	0018,9089	3
>> Diffusion b-value	0018,9087	3
>> Diffusion Anisotropy Type	0018,9147	3

Private Attributes

Attribute Name	Tag	VR	Value
Private Creator	0009,0000	LO	From Application
Technologist	0009,1001	LO	From Application
ScheduledStudyDateTime	0009,1002	LO	From Application
StudyAppData	0009,1003	OB	From Application
ProtocolObjectID	0009,1004	UI	From Application
Name	0009,1005	LO	From Application
Frequency	0009,1006	IS	From Application
UpdateFlag	0009,1007	SH	From Application
Directory	0009,1008	SH	From Application
Comments	0009,1009	LO	From Application
Region	0009,100a	LO	From Application
Laterality	0009,100b	SH	From Application
TotalScanTime	0009,100c	TM	From Application
ContrastMedium	0009,100d	LO	From Application
CreateDateTime	0009,100e	LO	From Application
Creator	0009,100f	LO	From Application
SiteName	0009,1010	LO	From Application
ReferringPhysician	0009,1011	LO	From Application
Radiologist	0009,1012	LO	From Application
Technologist	0009,1013	LO	From Application

Attribute Name	Tag	VR	Value
ProtocolUid	0009,1014	UI	From Application
IsInLibrary	0009,1015	SH	From Application
Gating	0009,1016	LO	From Application
Note	0009,1017	ST	From Application
NumberOfTasks	0009,1018	IS	From Application
IsFlagRaised	0009,1019	SH	From Application
IsArchived	0009,101a	SH	From Application
IsDefault	0009,101b	SH	From Application
ProtocolAppData	0009,101c	OB	From Application
IsAllowCascadeSave	0009,101d	SH	From Application
IsAllowCascadeProtect	0009,101e	SH	From Application
TaskInfo	0009,101f	SQ	From Application
TaskInfoObjectID	0009,1020	UI	From Application
Name	0009,1021	LO	From Application
TaskStatus	0009,1022	SH	From Application
TaskPriority	0009,1023	SH	From Application
Leaf	0009,1024	SH	From Application
TaskID	0009,1025	LO	From Application
Frequency	0009,1026	IS	From Application
UpdateFlag	0009,1027	SH	From Application
Directory	0009,1028	SH	From Application
Comments	0009,1029	LO	From Application
Category	0009,102a	SH	From Application
Region	0009,102b	LO	From Application
Laterality	0009,102c	SH	From Application
ScanTime	0009,102d	TM	From Application
ContrastMedium	0009,102e	LO	From Application
CreateDateTime	0009,102f	LO	From Application
Creator	0009,1030	LO	From Application
SiteName	0009,1031	LO	From Application
ReferringPhysician	0009,1032	LO	From Application
Radiologist	0009,1033	LO	From Application
Technologist	0009,1034	LO	From Application
TaskUid	0009,1035	UI	From Application
TaskInfoUid	0009,1036	UI	From Application
IsInLibrary	0009,1037	SH	From Application
TaskOrder	0009,1038	IS	From Application
Gating	0009,1039	LO	From Application
Plane	0009,103a	SH	From Application
SequenceType	0009,103b	LO	From Application
IsExecutive	0009,103c	SH	From Application
Note	0009,103d	ST	From Application
AutoStart	0009,103e	SH	From Application
AutoSave	0009,103f	SH	From Application
AutoArchive	0009,1040	SH	From Application
QueueGroupID	0009,1041	IS	From Application
IsFlagRaised	0009,1042	SH	From Application
IsArchived	0009,1043	SH	From Application

Attribute Name	Tag	VR	Value
IsDefault	0009,1044	SH	From Application
TaskInfoAppData	0009,1045	OB	From Application
IsAllowCascadeSave	0009,1046	SH	From Application
IsAllowCascadeProtect	0009,1047	SH	From Application
ProtocolName	0009,1048	LO	From Application
Cms_BodyPartExamined	0009,104e	LO	From Application
IsProtected	0009,104f	LO	From Application
ProtocolObjectID	0009,105f	UI	From Application
TaskInfoAppData	0009,1060	OB	From Application
ProtocolTaskInfoObjectID	0009,1072	UI	From Application
ProtocolTaskOrder	0009,1073	IS	From Application
ProtocolTaskUid	0009,1074	UI	From Application
ProtocolTaskAppData	0009,1075	OB	From Application
ProtocolTaskIsAllowCascadeSave	0009,1076	SH	From Application
ProtocolTaskIsAllowCascadeProtect	0009,1077	SH	From Application
Private Creator	0011,0000	LO	From Application
IsRapidRegistration	0011,1001	LO	From Application
IsProtected	0011,1002	LO	From Application
Private Creator	0019,0000	LO	From Application
ProcType	0019,1001	LO	From Application
Plane	0019,1002	LO	From Application
IsSnapShotSeries	0019,1003	SH	From Application
MaxFsColor	0019,1004	DS	From Application
SeriesCategoryType	0019,1005	LO	From Application
ImageContrastBolusAgent	0019,1007	LO	From Application
ImageSliceThickness	0019,1008	LO	From Application
ImageReconstructionDiameter	0019,1009	LO	From Application
ImageEchoTime	0019,100a	LO	From Application
ImageRepetitionTime	0019,100b	LO	From Application
SequenceType	0019,100c	LO	From Application
TaskUid	0019,100d	LO	From Application
SeriesAppData	0019,100e	OB	From Application
MultiSliceNumber	0019,100f	IS	From Application
ImageScanTime	0019,1010	LO	From Application
IsProtected	0019,1011	LO	From Application
MultiFrameSopInstanceUid	0019,1020	UI	From Application
Private Creator	0029,0000	LO	From Application
SliceNumber	0029,1001	IS	From Application
PhaseNumber	0029,1002	IS	From Application
ProcType	0029,1003	LO	From Application
StopwatchTime	0029,1004	LO	From Application
Plane	0029,1005	LO	From Application
ScanTime	0029,1006	LO	From Application
DualSliceFlag	0029,1008	LO	From Application
SspRatio	0029,1009	LO	From Application
GatingSignalSource	0029,100a	LO	From Application
Rephase	0029,100b	LO	From Application
HalfEcho	0029,100c	LO	From Application

Attribute Name	Tag	VR	Value
RectFOVRatio	0029,100d	LO	From Application
HalfScan	0029,100e	LO	From Application
NumShots	0029,100f	LO	From Application
ContrastAgent	0029,1010	LO	From Application
EchoAllocation	0029,1011	LO	From Application
NumEchoShift	0029,1012	LO	From Application
FatSat	0029,1013	LO	From Application
MTC	0029,1014	LO	From Application
NumPreSat	0029,1015	LO	From Application
TargetVelocity	0029,1016	LO	From Application
VENCAxis	0029,1017	LO	From Application
NumVENCDirection	0029,1018	LO	From Application
IsScalableWindowLevel	0029,101c	LO	From Application
ThreeDSettingLineAngle	0029,101d	LO	From Application
MPGTotalAxis	0029,101e	LO	From Application
MPGAxisNumber	0029,101f	LO	From Application
MultiEchoNumber	0029,1020	IS	From Application
NaviAverageGateWidth	0029,1021	DS	From Application
ShimCompensateValue	0029,1022	ST	From Application
GCOffset	0029,1023	LO	From Application
NaviMaxGateWidth	0029,1024	DS	From Application
NaviMinGateWidth	0029,1025	DS	From Application
NaviMaxGatePosition	0029,1026	DS	From Application
NaviMinGatePosition	0029,1027	DS	From Application
TimeDuration	0029,1028	DS	From Application
TablePosition	0029,1029	DS	From Application
NaviInitialGateWidth	0029,102a	DS	From Application
NaviFinalGateWidth	0029,102b	DS	From Application
NaviInitialGatePosition	0029,102c	DS	From Application
NaviFinalGatePosition	0029,102d	DS	From Application
NaviAverageGatePosition	0029,102e	DS	From Application
ImageAppData	0029,102f	OB	From Application
DiffusionBValue	0029,1030	FD	The value is same as Diffusion b-value of MR Diffusion Macro
SharedFunctionalGroupsSequence	0029,1031	SQ	The value is same as Shared Functional Groups Sequence of Multi-frame Functional Groups Module
PerFrameFunctionalGroupsSequence	0029,1032	SQ	The value is same as Per-frame Functional Groups Sequence of Multi-frame Functional Groups Module
LossyImageCompressionRatio	0029,1033	DS	The value is same as Lossy Image Compression Ratio of Enhanced MR Image Module
InstanceCreatorUID	0029,1034	UI	The value is same as Instance Creator UID of SOP Common Module
RelatedGeneralSOPClassUID	0029,1035	UI	The value is same as Related General SOP Class UID of SOP Common Module

Attribute Name	Tag	VR	Value
OriginalSpecializedSOPClassUID	0029,1036	UI	The value is same as Original Specialized SOP Class UID of SOP Common Module
TimezoneOffsetFromUTC	0029,1037	SH	The value is same as Timezone Offset From UTC of SOP Common Module
SOPInstanceStatus	0029,1038	CS	The value is same as SOP Instance Status of SOP Common Module
SOPAuthorizationDateandTime	0029,1039	DT	The value is same as SOP Authorization Date and Time of SOP Common Module
SOPAuthorizationComment	0029,103a	LT	The value is same as SOP Authorization Comment of SOP Common Module
AuthorizationEquipmentCertificationNumber	0029,103b	LO	The value is same as Authorization Equipment Certification Number of SOP Common Module
ConcatenationFrameOffsetNumber	0029,103c	UL	The value is same as Concatenation Frame Offset Number of Multi-frame Functional Groups Module
RepresentativeFrameNumber	0029,103d	CS	The value is same as Representative Frame Number of Multi-frame Functional Groups Module
ConcatenationUID	0029,103e	UI	The value is same as Concatenation UID of Multi-frame Functional Groups Module
InConcatenationNumber	0029,103f	US	The value is same as In-concatenation Number of Multi-frame Functional Groups Module
CardiacSynchronizationTechnique	0029,1040	CS	The value is same as Cardiac Synchronization Technique of Cardiac Synchronization Module
CardiacSignalSource	0029,1041	CS	The value is same as Cardiac Signal Source of Cardiac Synchronization Module
CardiacRRIntervalSpecified	0029,1042	FD	The value is same as Cardiac RR Interval Specified of Cardiac Synchronization Module
CardiacBeatRejectionTechnique	0029,1043	CS	The value is same as Cardiac Beat Rejection Technique of Cardiac Synchronization Module
LowRRValue	0029,1044	IS	The value is same as Low R-R Value of Cardiac Synchronization Module
HighRRValue	0029,1045	IS	The value is same as High R-R Value of Cardiac Synchronization Module
IntervalsAcquired	0029,1046	IS	The value is same as Intervals Acquired of Cardiac Synchronization Module
IntervalsRejected	0029,1047	IS	The value is same as Intervals Rejected of Cardiac Synchronization Module

Attribute Name	Tag	VR	Value
RespiratoryMotionCompensationTechnique	0029,1048	CS	The value is same as Respiratory Motion Compensation Technique of Respiratory Synchronization Module
RespiratorySignalSource	0029,1049	CS	The value is same as Respiratory Signal Source of Respiratory Synchronization Module
BulkMotionCompensationTechnique	0029,104a	CS	The value is same as Bulk Motion Compensation Technique of Bulk Motion Synchronization Module
BulkMotionSignalSource	0029,104b	CS	The value is same as Bulk Motion Signal Source of Bulk Motion Synchronization Module
PixelPresentation	0029,104c	CS	The value is same as Pixel Presentation of Common CT/MR Image Description Macro/Enhanced MR Image Module
VolumetricProperties	0029,104d	CS	The value is same as Volumetric Properties of Common CT/MR Image Description Macro/Enhanced MR Image Module
VolumeBasedCalculationTechnique	0029,104e	CS	The value is same as Volume Based Calculation Technique of Common CT/MR Image Description Macro/Enhanced MR Image Module
AcquisitionContextDescription	0029,104f	ST	The value is same as Acquisition Context Description of Acquisition Context Module
ModalityLUTSequence	0029,1050	SQ	The value is same as Mdality LUT module
LUTDescriptor	0029,1051	LO	The value is same as LUT Descriptor of Modality LUT module
LUTExplanation	0029,1052	LO	The value is same as LUT Explanation of Modality LUT module
LUTData	0029,1053	LO	The value is same as LUT Data of Modality LUT module
PresentationLUTShape	0029,1054	CS	The value is same as Presentation LUT Shape of General Image Module/Enhanced MR Image Module
FrameAnatomySequence	0029,1055	SQ	The value is same as Frame Anatomy Sequence of Frame Anatomy Macro
FrameLaterality	0029,1056	CS	The value is same as Frame Laterality of Frame Anatomy Macro
AnatomicRegionSequence	0029,1057	SQ	The value is same as Anatomic Region Sequence of General Anatomy Macro
AnatomicRegionCodeValue	0029,1058	SH	The value is same as Code Value of Code Sequence Macro
AnatomicRegionCodingSchemeDesignator	0029,1059	SH	The value is same as Coding Scheme Designator of Code Sequence Macro

Attribute Name	Tag	VR	Value
AnatomicRegionCodingSchemeVersion	0029,105a	SH	The value is same as Coding Scheme Version of Code Sequence Macro
AnatomicRegionCodeMeaning	0029,105b	LO	The value is same as Code Meaning of Code Sequence Macro
PixelValueTransformationSequence	0029,105c	SQ	The value is same as Pixel Value Transformation Sequence of Pixel Value Transformation Macro
RescaleType	0029,105d	LO	The value is same as Rescale Type of Pixel Value Transformation Macro
CardiacTriggerSequence	0029,105e	SQ	The value is same as Cardiac Synchronization Macro
TriggerDelayTime	0029,105f	FD	The value is same as Nominal Cardiac Trigger Delay Time of Cardiac Synchronization Macro
FrameVOILUTSequence	0029,1060	SQ	The value is same as Frame VOI LUT Sequence of Frame VOI LUT Macro
WindowCenterAndWidthExplanation	0029,1061	LO	The value is same as Window Center & Width Explanation of Frame VOI LUT Macro
AcquisitionContrast	0029,1062	CS	The value is same as Acquisition Contrast of MR Image Description Macro
MRModifierSequence	0029,1063	SQ	The value is same as MR Modifier Sequence of MR Modifier Macro
ParallelAcquisitionTechnic	0029,1064	CS	The value is same as Parallel Acquisition Technique of MR Modifier Macro
ParallelReductionFactorSecIn	0029,1065	FD	The value is same as Parallel Reduction Factor Second In-plane of MR Modifier Macro
InversionRecovery	0029,1066	CS	The value is same as Inversion Recovery of MR Modifier Macro
FlowCompensation	0029,1067	CS	The value is same as Flow Compensation of MR Modifier Macro
FlowCompensationDirection	0029,1068	CS	The value is same as Flow Compensation Direction of MR Modifier Macro
SpatialPreSaturation	0029,1069	CS	The value is same as Spatial Pre-saturation of MR Modifier Macro
PartialFourier	0029,106a	CS	The value is same as Partial Fourier of MR Modifier Macro
PartialFourierDirection	0029,106b	CS	The value is same as Partial Fourier Direction of MR Modifier Macro
ResonantNucleus	0029,106c	CS	The value is same as Resonant Nucleus of Enhanced MR Image Module
KSpaceFiltering	0029,106d	CS	The value is same as k-space Filtering of Enhanced MR Image Module

Attribute Name	Tag	VR	Value
ApplicableSafetyStandardAgency	0029,106e	CS	The value is same as Applicable Safety Standard Agency of Enhanced MR Image Module
ApplicableSafetyStandardDescription	0029,106f	LO	The value is same as Applicable Safety Standard Description of Enhanced MR Image Module
MRReceiveCoilSequence	0029,1070	SQ	The value is same as MR Receive Coil Sequence of MR Receive Coil Macro
ReceiveCoilManufacturerName	0029,1071	LO	The value is same as Receive Coil Manufacturer Name of MR Receive Coil Macro
ReceiveCoilType	0029,1072	CS	The value is same as Receive Coil Type of MR Receive Coil Macro
QuadratureReceiveCoil	0029,1073	CS	The value is same as Quadrature Receive Coil of MR Receive Coil Macro
MultiCoilConfiguration	0029,1074	LO	The value is same as Multi-Coil Configuration of MR Receive Coil Macro
ComplexImageComponent	0029,1075	CS	The value is same as Complex Image Component of MR Image Frame Type Macro/Enhanced MR Image Module/MR Image Description Macro
PulseSequenceName	0029,1076	SH	The value is same as Pulse Sequence Name of MR Pulse Sequence Module
EchoPulseSequence	0029,1077	CS	The value is same as Echo Pulse Sequence of MR Pulse Sequence Module
MultipleSpinEcho	0029,1078	CS	The value is same as Multiple Spin Echo of MR Pulse Sequence Module
MultiPlanarExcitation	0029,1079	CS	The value is same as Multi-planar Excitation of MR Pulse Sequence Module
PhaseContrast	0029,107a	CS	The value is same as Phase Contrast of MR Pulse Sequence Module
TimeOfFlightContrast	0029,107b	CS	The value is same as Time of Flight Contrast of MR Pulse Sequence Module
SteadyStatePulseSequence	0029,107c	CS	The value is same as Steady State Pulse Sequence of MR Pulse Sequence Module
EchoPlanarPulseSequence	0029,107d	CS	The value is same as Echo Planar Pulse Sequence of MR Pulse Sequence Module
SpectrallySelectedSuppression	0029,107e	CS	The value is same as Spectrally Selected Suppression of MR Pulse Sequence Module
OversamplingPhase	0029,107f	CS	The value is same as Oversampling Phase of MR Pulse Sequence Module

Attribute Name	Tag	VR	Value
SegmentedKSpaceTraversal	0029,1080	CS	The value is same as Segmented k-Space Traversal of MR Pulse Sequence Module
CoverageOfKSpace	0029,1081	CS	The value is same as Coverage of k-Space of MR Pulse Sequence Module
MRTimingAndRelatedParametersSequence	0029,1082	SQ	The value is same as MR Timing and Related Parameters Sequence of MR Timing and Related Parameters Macro
RFEchoTrainLength	0029,1083	US	The value is same as RF Echo Train Length of MR Timing and Related Parameters Macro
GradientEchoTrainLength	0029,1084	US	The value is same as Gradient Echo Train Length of MR Timing and Related Parameters Macro
GradientOutputType	0029,1085	CS	The value is same as Gradient Output Type of MR Timing and Related Parameters Macro
GradientOutput	0029,1086	FD	The value is same as Gradient Output of MR Timing and Related Parameters Macro
MRFOVGeometrySequence	0029,1087	SQ	The value is same as MR FOV Geometry Sequence of MR FOV/Geometry Macro
MRAcquisitionFrequencyEncodingSteps	0029,1088	US	The value is same as MR Acquisition Frequency Encoding Steps of MR FOV/Geometry Macro
MRAcquisitionPhaseEncodingStepsInPlane	0029,1089	US	The value is same as MR Acquisition Phase Encoding Steps in-plane of MR FOV/Geometry Macro
MRAcquisitionPhaseEncodingStepsOutOfPlane	0029,108a	US	The value is same as MR Acquisition Phase Encoding Steps out-of-plane of MR FOV/Geometry Macro
MRTransmitCoilSequence	0029,108b	SQ	The value is same as MR Transmit Coil Sequence of MR Transmit Coil Macro
TransmitCoilName	0029,108c	SH	The value is same as Transmit Coil Name of MR Transmit Coil Macro
TransmitCoilManufacturerName	0029,108d	LO	The value is same as Transmit Coil Manufacturer Name of MR Transmit Coil Macro
TransmitCoilType	0029,108e	CS	The value is same as Transmit Coil Type of MR Transmit Coil Macro
MREchoSequence	0029,108f	SQ	The value is same as MR Echo Sequence of MR Echo Macro
EffectiveEchoTime	0029,1090	FD	The value is same as Effective Echo Time of MR Echo Macro
MRMetaboliteMapSequence	0029,1091	SQ	The value is same as MR Metabolite Map Sequence of MR Metabolite Map Macro

Attribute Name	Tag	VR	Value
MetaboliteMapDescription	0029,1092	ST	The value is same as Metabolite Map Description of MR Metabolite Map Macro
MetaboliteMapCodeSequence	0029,1093	SQ	The value is same as Metabolite Map Code Sequence of MR Metabolite Map Macro
MetaboliteMapCodeValue	0029,1094	SH	The value is same as Code Value of Code Sequence Macro
MetaboliteMapCodingSchemeDesignator	0029,1095	SH	The value is same as Coding Scheme Designator of Code Sequence Macro
MetaboliteMapCodingSchemeVersion	0029,1096	SH	The value is same as Coding Scheme Version of Code Sequence Macro
MetaboliteMapCodeMeaning	0029,1097	LO	The value is same as Code Meaning of Code Sequence Macro
MRImagingModifierSequence	0029,1098	SQ	The value is same as MR Imaging Modifier Sequence of MR Imaging Modifier Macro
MagnetizationTransfer	0029,1099	CS	The value is same as Magnetization Transfer of MR Imaging Modifier Macro
BloodSignalNulling	0029,109a	CS	The value is same as Blood Signal Nulling of MR Imaging Modifier Macro
Tagging	0029,109b	CS	The value is same as Tagging of MR Imaging Modifier Macro
TagSpacingFirstDimension	0029,109c	FD	The value is same as Tag Spacing First Dimension of MR Imaging Modifier Macro
TagSpacingSecondDimension	0029,109d	FD	The value is same as Tag Spacing Second Dimension of MR Imaging Modifier Macro
TagAngleFirstAxis	0029,109e	FD	The value is same as Tag Angle First Axis of MR Imaging Modifier Macro
TagAngleSecondAxis	0029,109f	SS	The value is same as Tag Angle Second Axis of MR Imaging Modifier Macro
TagThickness	0029,10a0	FD	The value is same as Tag Thickness of MR Imaging Modifier Macro
TaggingDelay	0029,10a1	FD	The value is same as Tagging Delay of MR Imaging Modifier Macro
TransmitterFrequency	0029,10a2	FD	The value is same as Transmitter Frequency of MR Imaging Modifier Macro
PixelBandwidth	0029,10a3	DS	The value is same as Pixel Band width of MR Imaging Modifier Macro
MRVelocityEncodingSequence	0029,10a4	SQ	The value is same as MR Velocity Encoding Sequence of MR Velocity Encoding Macro
VelocityEncodingDirection	0029,10a5	FD	The value is same as Velocity Encoding Direction of MR Velocity Encoding Macro

Attribute Name	Tag	VR	Value
VelocityEncodingMinimumValue	0029,10a6	FD	The value is same as Velocity Encoding Minimum Value of MR Velocity Encoding Macro
VelocityEncodingMaximumValue	0029,10a7	FD	The value is same as Velocity Encoding Maximum Value of MR Velocity Encoding Macro
MRImageFrameTypeSequence	0029,10a8	SQ	The value is same as MR Image Frame Type Sequence of MR Image Frame Type Macro
FrameType	0029,10a9	CS	The value is same as Frame Type of MR Image Frame Type Macro
PixelPresentation	0029,10aa	CS	The value is same as Pixel Presentation of Common CT/MR Image Description Macro
VolumetricProperties	0029,10ab	CS	The value is same as Volumetric Properties of Common CT/MR Image Description Macro
VolumeBasedCalculationTechnique	0029,10ac	CS	The value is same as Volume Based Calculation Technique of Common CT/MR Image Description Macro
BackgroundImageInstanceUID	0029,10bd	UI	From Application
IsStoredToPortableMedia	0029,10be	LO	From Application
Voi1	0029,10bf	DS	From Application
Voi2	0029,10c1	DS	From Application
MixingTime	0029,10c2	DS	From Application
SelectiveIRPosition	0029,10c3	DS	From Application
SelectiveIRRow	0029,10c4	DS	From Application
SelectiveIRColumn	0029,10c5	DS	From Application
SelectiveIROrientation	0029,10c6	DS	From Application
SelectiveIRThickness	0029,10c7	LO	From Application
RephaseOrderSlice	0029,10c8	SH	From Application
RephaseOrderPhase	0029,10c9	SH	From Application
RephaseOrderFreq	0029,10ca	SH	From Application
MetaboliteMapDescription	0029,10cb	ST	From Application
volumeLocalizationSeq	0029,10cc	SQ	From Application
SlabThickness	0029,10cd	FD	From Application
SlabOrientation	0029,10ce	FD	From Application
MidSlabPosition	0029,10cf	FD	From Application
AcqModeSliceDir	0029,10d0	LO	From Application
IRThicknessRatio	0029,10d1	LO	From Application
BBIRThicknessRatio	0029,10d2	LO	From Application
DeltaAngle	0029,10d3	LO	From Application
MultiFrameFrameNumber	0029,10d4	IS	From Application
EnhancedSopInstanceUid	0029,10d5	UI	From Application
PolarityOfPhaseEncoding	0029,10d6	LO	From Application
PresentationStates	0029,10d7	OB	From Application
Magnetic Field Direction	0029,10d9	DS	From Application
RawDataAppData	0041,1001	OB	From Application
RawDataIndex	0041,1002	SQ	From Application

Attribute Name	Tag	VR	Value
ChannelNumber	0041,1003	LO	From Application
AxisDirection	0041,1004	LO	From Application
SlabNumbe	0041,1005	LO	From Application
CardiacPhaseNumbe	0041,1006	LO	From Application
EchoNumber	0041,1007	LO	From Application
SliceEncodeNumber	0041,1008	LO	From Application
NsaNumber	0041,1009	LO	From Application
RawData	0041,100a	OB	From Application
RawDataMRInfo	0041,100b	SS	From Application
NumberOfVoxels	0041,100c	IS	From Application
MixingTime	0041,100d	DS	From Application
ADDiff	0041,100e	DS	From Application
ScanTime	0041,100f	LO	From Application
NumPreSat	0041,1010	LO	From Application
IsStoredToPortableMedia	0041,1011	LO	From Application
Voi1	0041,1012	DS	From Application
Voi2	0041,1013	DS	From Application
VoxelSize	0041,1014	DS	From Application
FreqPoint	0041,1015	IS	From Application
LowOrderShim	0041,1016	SH	From Application
EccLevel	0041,1017	SH	From Application
FwhmHz	0041,1018	FL	From Application
FwhmPpm	0041,1019	FL	From Application
WaterSupRate	0041,101a	FL	From Application
ForegroundTransparency	0071,1001	FL	From Application
IsDisplayBackgroundImage	0071,1002	LO	From Application
ForegroundHorizontalShift	0071,1003	FL	From Application
ForegroundVerticalShift	0071,1004	FL	From Application
ForegroundRotationAngle	0071,1005	FL	From Application
ForegroundMagnification	0071,1006	FL	From Application
ApplicationData	0071,1007	OB	From Application

13.3 Enhanced MR Image Module

MR Series Module Attributes

Attribute Name	Tag	Type
Modality	0008,0060	1

Enhanced General Equipment Module Attributes

Attribute Name	Tag	Type
Manufacturer	0008,0070	1
Manufacturer's Model Name	0008,1090	1
Device Serial Number	0018,1000	1
Software Versions	0018,1020	1

Multi-frame Functional Groups Module Attributes

Attribute Name	Tag	Type
Shared Functional Groups Sequence	5200,9229	2
Per-frame Functional Groups Sequence	5200,9230	1
Instance Number	0020,0013	1
Content Date	0008,0023	1
Content Time	0008,0033	1
Number of Frames	0028,0008	1

Multi-frame Functional Groups Macros Attributes

Attribute Name	Tag	Type
> Pixel Measures Sequence	0028,9110	1
>> Pixel Spacing	0028,0030	1C
>> Slice Thickness	0018,0050	1C
> Frame Content Sequence	0020,9111	1
>> Frame Reference DateTime	0018,9151	1C
>> Frame Acquisition DateTime	0018,9074	1C
>> Frame Acquisition Duration	0018,9220	1C
> Plane Position Sequence	0020,9113	1
>> Image Position (Patient)	0020,0032	1C
> Plane Orientation Sequence	0020,9116	1
>> Image Orientation (Patient)	0020,0037	1C
> Referenced Image Sequence	0008,1140	2
>> Referenced SOP Class UID	0008,1150	1
>> Referenced SOP Instance UID	0008,1155	1
>> Purpose of Reference Code Sequence	0040,A170	1
>>> Code Value	0008,0100	1
>>> Coding Scheme Designator	0008,0102	1
>>> Code Meaning	0008,0104	1
> Derivation Image Sequence	0008,9124	2
> Cardiac Synchronization Sequence	0018,9118	1
>> Nominal Cardiac Trigger Delay Time	0020,9153	1
> Frame Anatomy Sequence	0020,9071	1
>> Frame Laterality	0020,9072	1

Attribute Name	Tag	Type
>> Anatomic Region Sequence	0008,2218	1
>>> Code Value	0008,0100	1
>>> Coding Scheme Designator	0008,0102	1
>>> Coding Scheme Version	0008,0103	1C
>>> Code Meaning	0008,0104	1
> Pixel Value Transformation Sequence	0028,9145	1
>> Rescale Intercept	0028,1052	1
>> Rescale Slope	0028,1053	1
>> Rescale Type	0028,1054	1
> MR Image Frame Type Sequence	0018,9226	1
>> Frame Type	0008,9007	1
>> Pixel Presentation	0008,9205	1
>> Volumetric Properties	0008,9206	1
>> Volume Based Calculation Technique	0008,9207	1
>> Complex Image Component	0008,9208	1
>> Acquisition Contrast	0008,9209	1
> MR Timing and Related Parameters Sequence	0018,9112	1
>> Repetition Time	0018,0080	1C
>> Flip Angle	0018,1314	1C
>> Echo Train Length	0018,0091	1C
>> RF Echo Train Length	0018,9240	1C
>> Gradient Echo Train Length	0018,9241	1C
>> Gradient Output Type	0018,9180	1C
>> Gradient Output	0018,9182	1C
> MR FOV/Geometry Sequence	0018,9125	1
>> In-plane Phase Encoding Direction	0018,1312	1C
>> MR Acquisition Frequency Encoding Steps	0018,9058	1C
>> MR Acquisition Phase Encoding Steps in-plane	0018,9231	1C
>> MR Acquisition Phase Encoding Steps out-of-plane	0018,9232	1C
>> Percent Sampling	0018,0093	1C
>> Percent Phase Field of View	0018,0094	1C
> MR Echo Sequence	0018,9114	1
>> Effective Echo Time	0018,9082	1C
> MR Modifier Sequence	0018,9115	1
>> Inversion Recovery	0018,9009	1C
>> Inversion Times	0018,9079	1C
>> Flow Compensation	0018,9010	1C
>> Flow Compensation Direction	0018,9183	1C
>> Spoiling	0018,9016	1C
>> T2 Preparation	0018,9021	1C
>> Spectrally Selected Excitation	0018,9026	1C
>> Spatial Pre-saturation	0018,9027	1C
>> Partial Fourier	0018,9081	1C
>> Partial Fourier Direction	0018,9036	1C
>> Parallel Acquisition	0018,9077	1C
>> Parallel Acquisition Technique	0018,9078	1C
>> Parallel Reduction Factor In-plane	0018,9069	1C
>> Parallel Reduction Factor out-of-plane	0018,9155	1C

Attribute Name	Tag	Type
>> Parallel Reduction Factor Second In-plane	0018,9168	1C
> MR Imaging Modifier Sequence	0018,9006	1
>> Magnetization Transfer	0018,9020	1C
>> Blood Signal Nulling	0018,9022	1C
>> Tagging	0018,9028	1C
>> Tag Spacing First Dimension	0018,9030	1C
>> Tag Spacing Second Dimension	0018,9218	1C
>> Tag Angle First Axis	0018,9019	1C
>> Tag Angle Second Axis	0018,9219	1C
>> Tag Thickness	0018,9035	1C
>> Tagging Delay	0018,9184	3
>> Transmitter Frequency	0018,9098	1C
>> Pixel Bandwidth	0018,0095	1C
> MR Receive Coil Sequence	0018,9042	1
>> Receive Coil Name	0018,1250	1C
>> Receive Coil Manufacturer Name	0018,9041	2C
>> Receive Coil Type	0018,9043	1C
>> Quadrature Receive Coil	0018,9044	1C
>> Multi-Coil Definition Sequence	0018,9045	1C
>>> Multi-Coil Element Name	0018,9047	1
>>> Multi-Coil Element Used	0018,9048	1
>> Multi-Coil Configuration	0018,9046	3
> MR Transmit Coil Sequence	0018,9049	1
>> Transmit Coil Name	0018,1251	1C
>> Transmit Coil Manufacturer Name	0018,9050	2C
>> Transmit Coil Type	0018,9051	1C
> MR Diffusion Sequence	0018,9117	1
>> Diffusion b-value	0018,9087	1C
>> Diffusion Directionality	0018,9075	1C
>> Diffusion Gradient Direction Sequence	0018,9076	1C
>>> Diffusion Gradient Orientation	0018,9089	1C
>> Diffusion Anisotropy Type	0018,9147	1C
> MR Averages Sequence	0018,9119	1
>> Number of Averages	0018,0083	1C
> MR Spatial Saturation Sequence	0018,9107	2
>> Slab Thickness	0018,9104	1
>> Slab Orientation	0018,9105	1
>> Mid Slab Position	0018,9106	1
> MR Metabolite Map Sequence	0018,9152	1
>> Metabolite Map Description	0018,9080	1C
> MR Velocity Encoding Sequence	0018,9197	1
>> Velocity Encoding Direction	0018,9090	1C
>> Velocity Encoding Minimum Value	0018,9091	1C
>> Velocity Encoding Maximum Value	0018,9217	1C

Multi-frame Dimension Module Attributes

Attribute Name	Tag	Type
Dimension Organization Sequence	0020,9221	2
Dimension Index Sequence	0020,9222	2

Cardiac Synchronization Module Attributes

Attribute Name	Tag	Type
Cardiac Synchronization Technique	0018,9037	1C
Cardiac Signal Source	0018,9085	1C
Cardiac RR Interval Specified	0018,9070	1C
Cardiac Beat Rejection Technique	0018,9169	1C
Low R-R Value	0018,1081	2C
High R-R Value	0018,1082	2C
Intervals Acquired	0018,1083	2C
Intervals Rejected	0018,1084	2C
Skip Beats	0018,1086	3

Respiratory Synchronization Module Attributes

Attribute Name	Tag	Type
Respiratory Motion Compensation Technique	0018,9170	1C
Respiratory Signal Source	0018,9171	1C

Bulk Motion Synchronization Module Attributes

Attribute Name	Tag	Type
Bulk Motion Compensation Technique	0018,9172	1C
Bulk Motion Signal Source	0018,9173	1C

Supplemental Palette Color Lookup Table Module Attributes

Attribute Name	Tag	Type
Red Palette Color Lookup Table Descriptor	0028,1101	1
Green Palette Color Lookup Table Descriptor	0028,1102	1
Blue Palette Color Lookup Table Descriptor	0028,1103	1
Red Palette Color Lookup Table Data	0028,1201	1
Green Palette Color Lookup Table Data	0028,1202	1
Blue Palette Color Lookup Table Data	0028,1203	1

Acquisition Context Module Attributes

Attribute Name	Tag	Type
Acquisition Context Sequence	0040,0555	2
Acquisition Context Description	0040,0556	3

MR Pulse Sequence Module Attributes

Attribute Name	Tag	Type
Pulse Sequence Name	0018,9005	1C
MR Acquisition Type	0018,0023	1C
Echo Pulse Sequence	0018,9008	1C
Multiple Spin Echo	0018,9011	1C
Multi-planar Excitation	0018,9012	1C
Phase Contrast	0018,9014	1C
Time of Flight Contrast	0018,9015	1C
Steady State Pulse Sequence	0018,9017	1C
Echo Planar Pulse Sequence	0018,9018	1C
Saturation Recovery	0018,9024	1C
Spectrally Selected Suppression	0018,9025	1C
Oversampling Phase	0018,9029	1C
Geometry of k-Space Traversal	0018,9032	1C
Rectilinear Phase Encode Reordering	0018,9034	1C
Segmented k-Space Traversal	0018,9033	1C
Coverage of k-Space	0018,9094	1C
Number of k-Space Trajectories	0018,9093	1C

Enhanced MR Image Module Attributes

Attribute Name	Tag	Type
Acquisition Number	0020,0012	3
Acquisition DateTime	0008,002A	1C
Acquisition Duration	0018,9073	1C
Referenced Image Evidence Sequence	0008,9092	1C
> Study Instance UID	0020,000D	1
> Referenced Series Sequence	0008,1115	1
>> Series Instance UID	0020,000E	1
>> Referenced SOP Sequence	0008,1199	1
>>> Referenced SOP Class UID	0008,1150	1
>>> Referenced SOP Instance UID	0008,1155	1
Content Qualification	0018,9004	1
Resonant Nucleus	0018,9100	1C
k-space Filtering	0018,9064	1C
Magnetic Field Strength	0018,0087	1C
Applicable Safety Standard Agency	0018,9174	1
Applicable Safety Standard Description	0018,9175	3
Image Comments	0020,4000	3
Image Type	0008,0008	1
Pixel Presentation	0008,9205	1
Volumetric Properties	0008,9206	1
Volume Based Calculation Technique	0008,9207	1
Complex Image Component	0008,9208	1
Acquisition Contrast	0008,9209	1
Samples per Pixel	0028,0002	1
Photometric Interpretation	0028,0004	1
Bits Allocated	0028,0100	1
Bits Stored	0028,0101	1
High Bit	0028,0102	1
Spacing between Slices	0018,0088	3
Burned In Annotation	0028,0301	1
Lossy Image Compression	0028,2110	1
Lossy Image Compression Ratio	0028,2112	1C
Presentation LUT Shape	2050,0020	1

13.4 SC Image Modules

SC Image Module Attributes

Attribute Name	Tag	Type
Conversion Type	0008,0064	1

13.5 GSPS Modules

Presentation Series Module Attributes

Attribute Name	Tag	Type
Modality	0008,0060	1

Presentation State Module Attributes

Attribute Name	Tag	Type
Instance Number	0020,0013	1
Presentation Label	0070,0080	1
Presentation Description	0070,0081	2
Presentation Creation Date	0070,0082	1
Presentation Creation Time	0070,0083	1
Presentation Creator's Name	0070,0084	2
Referenced Series Sequence	0008,1115	1
>Series Instance UID	0020,000E	1C
>Referenced Image Sequence	0008,1140	1C
>>Referenced SOP Class UID	0008,1150	1C
>>Referenced SOP Instance UID	0008,1155	1C

Displayed Area Module Attributes

Attribute Name	Tag	Type
Displayed Area Selection Sequence	0070,005A	1
>Referenced Image Sequence	0008,1140	1C
>>Referenced SOP Class UID	0008,1150	1C
>>Referenced SOP Instance UID	0008,1155	1C
>Displayed Area Top Left Hand Corner	0070,0052	1
>Displayed Area Bottom Right Hand Corner	0070,0053	1
>Presentation Size Mode	0070,0100	1
>Presentation Pixel Spacing	0070,0101	1C
>Presentation Pixel Magnification Ratio	0070,0103	1C

Graphic Annotation Module Attributes

Attribute Name	Tag	Type
Graphic Annotation Sequence	0070,0001	1
>Referenced Image Sequence	0008,1140	1C
>>Referenced SOP Class UID	0008,1150	1C
>>Referenced SOP Instance UID	0008,1155	1C
>Graphic Layer	0070,0002	1
>Text Object Sequence	0070,0008	1C
>>Anchor Point Annotation Units	0070,0004	1C
>>Unformatted Text Value	0070,0006	1
>>Anchor Point	0070,0014	1C
>>Anchor Point Visibility	0070,0015	1C
>Graphic Object Sequence	0070,0009	1C
>>Graphic Annotation Units	0070,0005	1
>>Graphic Dimensions	0070,0020	1
>>Number of Graphic Points	0070,0021	1
>>Graphic Data	0070,0022	1
>>Graphic Type	0070,0023	1
>>Graphic Filled	0070,0024	1C

Spatial Transformation Module Attributes

Attribute Name	Tag	Type
Image Rotation	0070,0042	1
Image Horizontal Flip	0070,0041	1

Graphic Layer Module Attributes

Attribute Name	Tag	Type
Graphic Layer Sequence	0070,0060	1
>Graphic Layer	0070,0002	1
>Graphic Layer Order	0070,0062	1
>Graphic Layer Recommended Display RGB Value	0070,0067	3
>Graphic Layer Description	0070,0068	3

Softcopy VOI LUT Module Attributes

Attribute Name	Tag	Type
Softcopy VOI LUT Sequence	0028,3110	1
>Referenced Image Sequence	0008,1140	1C
>>Referenced SOP Class UID	0008,1150	1C
>>Referenced SOP Instance UID	0008,1155	1C
>VOI LUT Sequence	0028,3010	1C
>>LUT Descriptor	0028,3002	1C
>>LUT Data	0028,3006	1C
>Window Center	0028,1050	1C
>Window Width	0028,1051	1C

Softcopy Presentation LUT Module Attributes

Attribute Name	Tag	Type
Presentation LUT Shape	2050,0020	1C

13.6 Key Object Selection Modules

SR Document Content Module Attributes

Attribute Name	Tag	Type
Observation Date time	0040,A032	1C
Content Template Sequence	0040,A504	1C
> Mapping Resource	0008,0105	3
> Template Identifier	0040,DB00	3
Content Sequence	0040,A730	1C
> Relationship Type	0040,A010	1
> Referenced Content Item Identifier	0040,DB73	1C
> Value Type	0040,A040	3
> Concept Name Code Sequence	0040,A043	3
>> Code Value	0008,0100	3
>> Coding Scheme Designator	0008,0102	3
>> Coding Scheme Version	0008,0103	3
>> Code Meaning	0008,0104	3
> Concept Code Sequence	0040,A168	3
>> Code Value	0008,0100	3
>> Coding Scheme Designator	0008,0102	3
>> Coding Scheme Version	0008,0103	3
>> Code Meaning	0008,0104	3
> Relationship Type	0040,A010	1
> Referenced Content Item Identifier	0040,DB73	1C
> Value Type	0040,A040	3
> Concept Name Code Sequence	0040,A043	3
>> Code Value	0008,0100	3
>> Coding Scheme Designator	0008,0102	3
>> Coding Scheme Version	0008,0103	3
>> Code Meaning	0008,0104	3
> Concept Code Sequence	0040,A168	3
>> Code Value	0008,0100	3
>> Coding Scheme Designator	0008,0102	3
>> Coding Scheme Version	0008,0103	3
>> Code Meaning	0008,0104	3
> Relationship Type	0040,A010	1
> Referenced Content Item Identifier	0040,DB73	1C
> Value Type	0040,A040	3
> Concept Name Code Sequence	0040,A043	3
>> Code Value	0008,0100	3
>> Coding Scheme Designator	0008,0102	3
>> Coding Scheme Version	0008,0103	3
>> Code Meaning	0008,0104	3
> Person Name	0040,A123	3
> Relationship Type	0040,A010	1
> Referenced Content Item Identifier	0040,DB73	1C
> Value Type	0040,A040	3
> Concept Name Code Sequence	0040,A043	3

Attribute Name	Tag	Type
>> Code Value	0008,0100	3
>> Coding Scheme Designator	0008,0102	3
>> Coding Scheme Version	0008,0103	3
>> Code Meaning	0008,0104	3
> Text Value	0040,A160	3
> Relationship Type	0040,A010	1
> Referenced Content Item Identifier	0040,DB73	1C
> Referenced SOP Sequence	0008,1199	3
>> Referenced SOP Class UID	0008,1150	3
>> Referenced SOP Instance UID	0008,1155	3
> Value Type	0040,A040	3
Value Type	0040,A040	1
Concept Name Code Sequence	0040,A043	1
> Code Value	0008,0100	1
> Coding Scheme Designator	0008,0102	1
> Code Meaning	0008,0104	1
> Coding Scheme Version	0008,0103	1C
> Mapping Resource	0008,0105	1
> Context Group Version	0008,0106	1C
> Context Group Local Version	0008,0107	1C
> Context Group Extension Creator UID	0008,010D	1C
> Context Group Extension Flag	0008,010B	3
> Context Identifier	0008,010F	3
Continuity Of Content	0040,A050	1

Key Object Document Module Attributes

Attribute Name	Tag	Type
Content Date	0008,0023	1
Content Time	0008,0033	1
Instance Number	0020,0013	1
Referenced Request Sequence	0040,A370	1C
Current Requested Procedure Evidence Sequence	0040,A375	1
> Study Instance UID	0020,000D	1
> Referenced Series Sequence	0008,1115	3
>>Referenced SOP Sequence	0008,1199	3
>>> Referenced SOP Class UID	0008,1150	3
>>> Referenced SOP Instance UID	0008,1155	3
>>Series Instance UID	0020,000E	3
Identical Documents Sequence	0040,A525	1C

Key Object Document Series Module Attributes

Attribute Name	Tag	Type
Modality KO	0008,0060	1
Referenced Performed Procedure Step Sequence	0008,1111	2
Series Instance UID	0020,000E	1
Series Number	0020,0011	1

14. Annex B

This annex details the actual Return keys for Modality Worklist Information Model -FIND request.

Return Keys for Modality Worklist Information Model - FIND

Attribute Name	Tag	Type
Specific Character Set	0008,0005	1C
Scheduled Procedure Step Sequence	0040,0100	1
>Scheduled Station AE Title	0040,0001	1
>Scheduled Procedure Step Start Date	0040,0002	1
>Scheduled Procedure Step Start Time	0040,0003	1
>Scheduled Procedure Step End Date	0040,0004	3
>Scheduled Procedure Step End Time	0040,0005	3
>Modality	0008,0060	1
>Scheduled Performing Physician Name	0040,0006	2
>Scheduled Procedure Step Description	0040,0007	1C
>Scheduled Station Name	0040,0010	2
>Scheduled Procedure Step Location	0040,0011	2
>Scheduled Protocol Code Sequence	0040,0008	1C
>>Code Value	0008,0100	1C
>>Coding Scheme Designator	0008,0102	1C
>>Coding Scheme Version	0008,0103	3
>>Code Meaning	0008,0104	3
>Pre-Medication	0040,0012	2C
>Scheduled Procedure Step ID	0040,0009	1
>Requested Contrast Agent	0032,1070	2C
>Scheduled Procedure Step Status	0040,0020	3
>Comments on the Scheduled Procedure Step	0040,0400	3
Requested Procedure ID	0040,1001	1
Requested Procedure Description	0032,1060	1C
Requested Procedure Code Sequence	0032,1064	1C
>Code Value	0008,0100	1C
>Coding Scheme Designator	0008,0102	1C
>Coding Scheme Version	0008,0103	3
>Code Meaning	0008,0104	3
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
Requested Procedure Priority	0040,1003	2
Patient Transport Arrangements	0040,1004	2
Reason For Requested Procedure	0040,1002	3
Requested Procedure Comments	0040,1400	3
Requested Procedure Location	0040,1005	3
Confidentiality Code	0040,1008	3
Reporting Priority	0040,1009	3
Names of Intended Recipients of Results	0040,1010	3

Attribute Name	Tag	Type
Accession Number	0008,0050	2
Requesting Physician	0032,1032	2
Referring Physician's Name	0008,0090	2
Reason for the Imaging Service Request	0040,2001	3
Imaging Service Request Comments	0040,2400	3
Requesting Service	0032,1033	3
Issuing Date of Imaging Service Request	0040,2004	3
Issuing Time of Imaging Service Request	0040,2005	3
Placer Order Number / Imaging Service Request	0040,2016	3
Filler Order Number / Imaging Service Request	0040,2017	3
Order Entered By …	0040,2008	3
Order Enterer's Location	0040,2009	3
Order Callback Phone Number	0040,2010	3
Admission ID	0038,0010	2
Issuer of Admission ID	0038,0011	3
Institution Name	0008,0080	3
Institution Address	0008,0081	3
Institution Code Sequence	0008,0082	3
>Code Value	0008,0100	3
>Coding Scheme Designator	0008,0102	3
>Coding Scheme Version	0008,0103	3
>Code Meaning	0008,0104	3
Current Patient Location	0038,0300	2
Visit Status ID	0038,0008	3
Patient's Institution Residence	0038,0400	3
Visit Comments	0038,4000	3
Referenced Patient Sequence	0008,1120	2
>Referenced SOP Class UID	0008,1150	2
>Referenced SOP Instance UID	0008,1155	2
Referring Physician's Address	0008,0092	3
Referring Physician's Phone Numbers	0008,0094	3
Admitting Diagnosis Description	0008,1080	3
Admitting Diagnosis Code Sequence	0008,1084	3
>Code Value	0008,0100	3
>Coding Scheme Designator	0008,0102	3
>Coding Scheme Version	0008,0103	3
>Code Meaning	0008,0104	3
Route of Admissions	0038,0016	3
Admitting Date	0038,0020	3
Admitting Time	0038,0021	3
Referenced Visit Sequence	0008,1125	3
>Referenced SOP Class UID	0008,1150	3
>Referenced SOP Instance UID	0008,1155	3
Referenced Patient Alias Sequence	0038,0004	3
>Referenced SOP Class UID	0008,1150	3
>Referenced SOP Instance UID	0008,1155	3
Patient Name	0010,0010	1
Patient ID	0010,0020	1

Attribute Name	Tag	Type
Issuer of Patient ID	0010,0021	3
Other Patient IDs	0010,1000	3
Other Patient Names	0010,1001	3
Patient's Birth Name	0010,1005	3
Patient's Mother's Birth Name	0010,1060	3
Medical Record Locator	0010,1090	3
Patient's Birth Date	0010,0030	2
Patient's Sex	0010,0040	2
Patient's Weight	0010,1030	2
Confidentiality Constraint on Patient Data	0040,3001	2
Patient's Age	0010,1010	3
Patient's Occupation	0010,2180	3
Patient's Birth Time	0010,0032	3
Patient's Insurance Plan Code Sequence	0010,0050	3
>Code Value	0008,0100	3
>Coding Scheme Designator	0008,0102	3
>Coding Scheme Version	0008,0103	3
>Code Meaning	0008,0104	3
Patient's Size	0010,1020	3
Patient's Address	0010,1040	3
Military Rank	0010,1080	3
Branch of Service	0010,1081	3
Country of Residence	0010,2150	3
Region of Residence	0010,2152	3
Patient's Telephone Numbers	0010,2154	3
Ethnic Group	0010,2160	3
Patient's Religious Preference	0010,21F0	3
Patient Comments	0010,4000	3
Patient State	0038,0500	2
Pregnancy Status	0010,21C0	2
Medical Alerts	0010,2000	2
Contrast Allergies	0010,2110	2
Special Needs	0038,0050	2
Smoking Status	0010,21A0	3
Additional Patient History	0010,21B0	3
Last Menstrual Date	0010,21D0	3

15. Annex C

This annex details attributes for Modality Performed Procedure Step N-CREATE and N-SET request.

MPPS SOP Class N-CREATE, N-SET and Final State Attributes

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Req. Type Final State
Performed Procedure Step Relationship				
Scheduled Step Attribute Sequence	0040,0270	1/1	Not allowed	
>Study Instance UID	0020,000D	1/1	Not allowed	
>Referenced Study Sequence	0008,1110	2/2	Not allowed	
>>Referenced SOP Class UID	0008,1150	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Referenced SOP Instance UID	0008,1155	1C/1 (Required if Sequence Item is present)	Not allowed	
>Accession Number	0008,0050	2/2	Not allowed	
>Placer Order Number/Imaging Service Request	0040,2016	3/3	Not allowed	
>Filler Order Number/Imaging Service Request	0040,2017	3/3	Not allowed	
>Requested Procedure ID	0040,1001	2/2	Not allowed	
>Requested Procedure Description	0032,1060	2/2	Not allowed	
>Scheduled Procedure Step ID	0040,0009	2/2	Not allowed	
>Scheduled Procedure Step Description	0040,0007	2/2	Not allowed	
>Scheduled Protocol Code Sequence	0040,0008	2/2	Not allowed	
>>Code Value	0008,0100	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme designator	0008,0102	1C/1 (Required if Sequence Item is present)	Not allowed	
>>Coding Scheme Version	0008,0103	3/3	Not allowed	
>>Code Meaning	0008,0104	3/3	Not allowed	
Patient's Name	0010,0010	2/2	Not allowed	
Patient ID	0010,0020	2/2	Not allowed	
Patient's Birth Date	0010,0030	2/2	Not allowed	
Patient's Sex	0010,0040	2/2	Not allowed	

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Req. Type Final State
Referenced Patient Sequence	0008,1120	2/2	Not allowed	
>Referenced SOP Class UID	0008,1150	1C/1 (Required if Sequence Item is present)	Not allowed	
>Referenced Instance UID	0008,1155	1C/1 (Required if Sequence Item is present)	Not allowed	
Performed Procedure Step Information				
Performed Procedure Step ID	0040,0253	1/1	Not allowed	
Performed Station AE Title	0040,0241	1/1	Not allowed	
Performed Station Name	0040,0242	2/2	Not allowed	
Performed Location	0040,0243	2/2	Not allowed	
Performed Procedure Step Start Date	0040,0244	1/1	Not allowed	
Performed Procedure Step Start Time	0040,0245	1/1	Not allowed	
Performed Procedure Step Status	0040,0252	1/1	3/1	
Performed Procedure Step Description	0040,0254	2/2	3/2	
Performed Procedure Type Description	0040,0255	2/2	3/2	
Procedure Code Sequence	0008,1032	2/2	3/2	
>Code Value	0008,0100	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Designator	0008,0102	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Version	0008,0103	3/3	3/3	
>Code Meaning	0008,0104	3/3	3/3	
Performed Procedure Step End Date	0040,0250	2/2	3/1	1
Performed Procedure Step End Time	0040,0251	2/2	3/1	1

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Req. Type Final State
Image Acquisition Results				
Modality	0008,0060	1/1	Not allowed	
Study ID	0020,0010	2/2	Not allowed	
Performed Protocol Code Sequence	0040,0260	2/2	3/2	
>Code Value	0008,0100	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Designator	0008,0102	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Coding Scheme Version	0008,0103	3/3	3/3	
>Code Meaning	0008,0104	3/3	3/3	
Performed Series Sequence	0040,0340	2/2	3/1	1
>Performing Physician's Name	0008,1050	2C/2 (Required if Sequence Item is present)	2C/2 (Required if Sequence Item is present)	2
>Protocol Name	0018,1030	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	1
>Operator's Name	0008,1070	2C/2 (Required if Sequence Item is present)	2C/2 (Required if Sequence Item is present)	2
>Series Instance UID	0020,000E	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	1
>Series Description	0008,103E	2C/2 (Required if Sequence Item is present)	2C/2 (Required if Sequence Item is present)	2
>Retrieve AE Title	0008,0054	2C/2 (Required if Sequence Item is present)	2C/2 (Required if Sequence Item is present)	2
>Referenced Image Sequence	0008,1140	2C/2 (Required if Sequence Item is present)	2C/2 (Required if Sequence Item is present)	
>>Referenced SOP Class UID	0008,1150	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	

Attribute Name	Tag	Req. Type N-CREATE (SCU/SCP)	Req. Type N-SET (SCU/SCP)	Req. Type Final State
>>Referenced SOP Instance UID	0008,1155	1C/1 (Required if Sequence Item is present)	1C/1 (Required if Sequence Item is present)	
>Referenced Standalone SOP Instance Sequence	0040,0220	2C/2 (Required if Sequence Item is present)	2C/2 (Required if Sequence Item is present)	