Global Imaging Online

WEB PACS, WEB RIS, Télé-Imagerie, Applications 3D

DIAM4 Server

DICOM Conformance Statement

Revision 2.2

07/04/2006

Date	Rev.	Author	Comment
10/02/2003	1	H. Baekeland	Initial Release
31/03/2005	2	H. Baekeland	Added Query Retrieve SCU And Storage Commitment SCU/SCP
28/04/2005	2.1	H. Baekeland	Update Layout
07/04/2006	2.2	S. Moulinet JC. Judais	Added MPPS Added Presentation State

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1 Introduction

1.1 Purpose of this document

The purpose of this document is to describe how DIAM[4] Server conforms to the DICOM standard. It describes what parts and definition it uses and in what way, in order to provide interoperability with other devices that claim same conformance.

1.2 Sources for this document

American College of Cardiology – National Manufactures Association (ACR-NEMA) Digital Imaging and Communications V2.0
ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) v3.0, Final Draft, May. 1998

1.3 Acronyms and abbreviation

The following symbols and abbreviations are used in this Part.

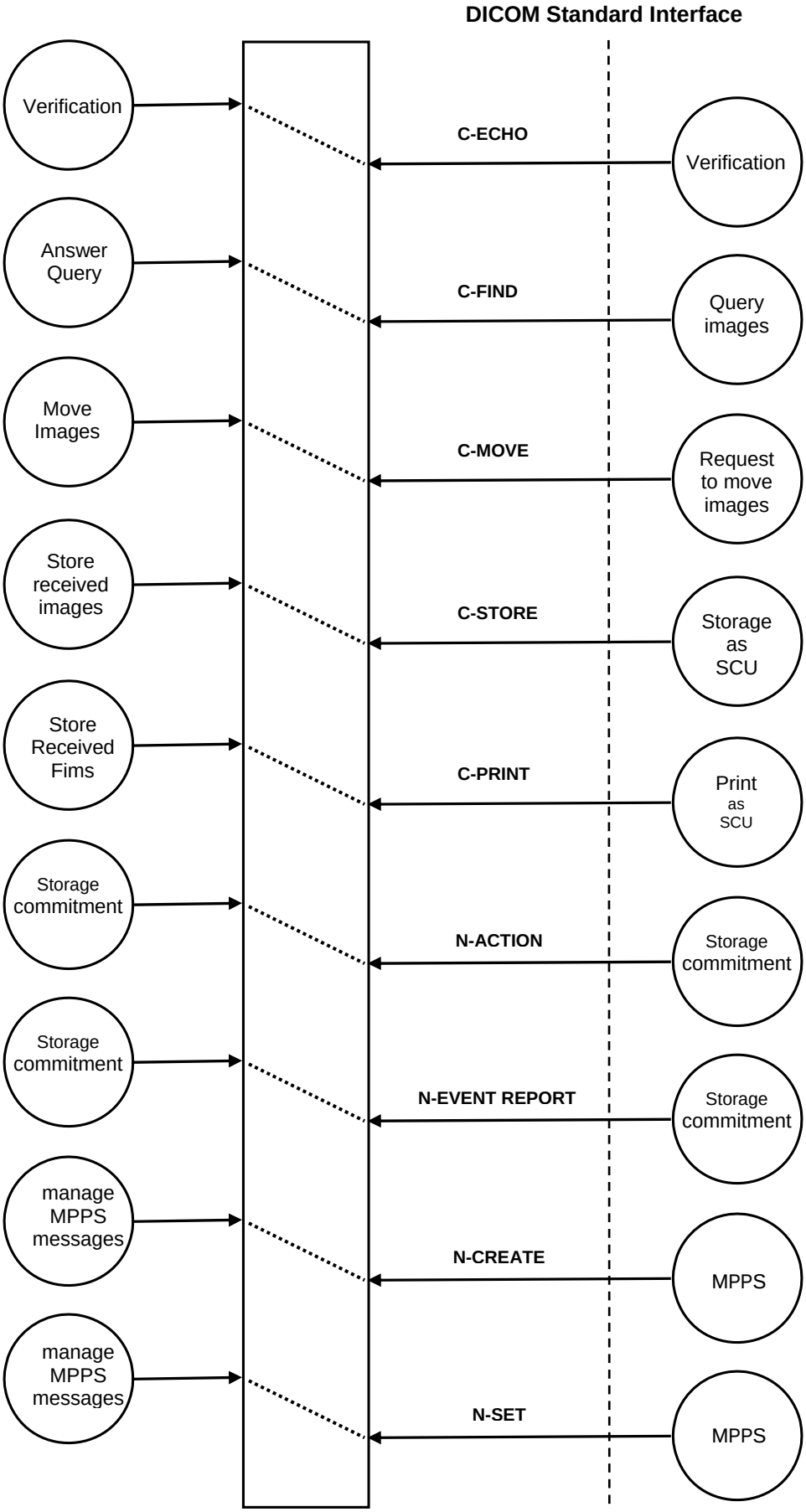
- ACR — American College of Radiology
- ACSE — Association Control Service Element
- AE — Application Entity
- ANSI — American National Standards Institute
- AP — Application Profile
- API — Application Programming Interface
- ASCII — American Standard Code for Information Interchange
- CEN TC251 — Comite Europeen de Normalisation - Technical Committee 251 – Medical Informatics
- DICOM — Digital Imaging and Communications in Medicine
- DIMSE — DICOM Message Service Element
- DIMSE-C — DICOM Message Service Element-Composite
- DIMSE-N — DICOM Message Service Element-Normalized
- FSC — File-set Creator
- FSR — File-set Reader
- FSU — File-set Updater
- HISPP — Healthcare Informatics Standards Planning Panel
- HL7 — Health Level 7
- IE — Information Entity
- IEEE — Institute of Electrical and Electronics Engineers
- IOD — Information Object Definition
- ISO — International Standards Organization
- ISP — International Standardized Profile
- JIRA — Japanese Industry Radiology Apparatus
- MSDS — Healthcare Message Standard Developers Sub-Committee
- NEMA — National Electrical Manufacturers Association
- OSI — Open Systems Interconnection
- PDU — Protocol Data Unit
- RWA — Real-World Activity
- SCP — Service Class Provider
- SCU — Service Class User
- SOP — Service-Object Pair

- TCP/IP Transmission Control Protocol/Internet Protocol
- UID Unique Identifier

2 Implementation Model

DIAM^4 Server is a web based PACS solution. DIAM^4 Server stores images sent to it by service class users, takes responsibility for storage of the images, can respond to a storage commitment demand, allows queries based on several standard query models, and retrieves requested images. DIAM^4 Server also stores films sent to it by service class user.

2.1 Application Data flow diagram



2.2 Functional Definition of Application Entities

2.2.1 Verification

DIAM[4] Server will respond to a **C-ECHO** verification.
DIAM[4] Server will also ask for a **C-ECHO** verification.

2.2.2 Receive Images

DIAM[4] Server stores a received image in its entirety, without change, in its internal data store. DIAM[4] Server stores each image with the File Meta Information attached to it.
DIAM[4] Server extracts the query information with respect to the patient, study, series and image, and stores this information within its internal database.

2.2.3 Transmit Images

DIAM[4] Server acts a Service Class User of C-Store to transmit images to other compatible devices.

2.2.4 Query from Other Devices

DIAM[4] Server responds to queries based on the records stored in its database.

2.2.5 Query to Other Devices

DIAM[4] Server can query other compatible devices.

2.2.6 Retrieve to Other Devices

DIAM[4] Server acts as a Service Class Provider of C-Move to retrieve images. It does so by obtaining a reference from the database then obtaining the image object itself from the data store.

2.2.7 Retrieve from Other Devices

DIAM[4] Server can retrieve images from other compatible devices.

2.2.8 Receive Films

DIAM[4] Server stores a received film in its entirety, without change, in its internal data store. DIAM[4] Server stores each film with the File Meta Information attached to it.

2.2.9 Send Films

DIAM[4] Server can send films to other compatible devices.

2.2.10 Commitment to Store Images received

DIAM[4] Server acts a Service Class Provider of Storage Commitment to explicitly take responsibility for storing images received.

2.2.11 Ask Commitment to other devices

DIAM[4] Server can ask storage commitment to other compatible devices.

2.2.12 Modality Performed Procedure Step

DIAM[4] Server can receive Modality Performed Procedure Step messages from modalities. When DIAM[4] Server receives a DICOM Modality Performed Procedure Step SOP Class N-CREATE request, it creates a new obejct in its database. When DIAM[4] Server receives a DICOM Modality Performed Procedure Step SOP Class N-SET request, it updates the corresponding object.

DIAM[4] Server can also route this messages to other Dicom devices.

2.2.13 Presentation state

DIAM[4] Server can receive Grayscale Softcopy Presentation State objects from other DICOM devices. It stores these in its database and applies them when the display of related objects is performed.

DIAM[4] Server can't create Grayscale Softcopy Presentation State objects.

2.3 Sequencing of real world activity

Not applicable.

3 AE Specifications

3.1 DIAM[4] Server specification

DIAM[4] Server provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU.

Table 1 : Verification SOP Class as SCU

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1

Table 2 : Query/Retrieve SOP Classes as SCU

SOP Class Name	SOP Class UID
Study Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.2.2

Table 3 : Storage SOP Classes as SCU

SOP Class Name	SOP Class UID
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital Intra Oral X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra Oral X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Digital Mammography X-ray Image Storage For Present.	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2
PET Image Storage	1.2.840.10008.5.1.4.1.1.128
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
RETIRED Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.5
RETIRED Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6
RETIRED Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Stored Print Storage	1.2.840.10008.5.1.1.27
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2

Table 4 : Storage Commitment SOP Classes as SCU

SOP Class Name	SOP Class UID
Storage Commitment Push Model	1.2.840.10008.1.20.1

Table 5 : Print SOP Class as SCU

SOP Class Name	SOP Class UID
BasicFilmSession	1.2.840.10008.5.1.1.1
BasicFilmBox	1.2.840.10008.5.1.1.2
BasicGrayscaleImageBox	1.2.840.10008.5.1.1.4
BasicColorImageBox	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

DIAM[4] Server provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCP.

Table 6 : Verification SOP Class as SCP

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1

Table 7 : Query/Retrieve SOP Classes as SCP

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.3.2

Table 8 : Storage Commitment SOP Classes as SCP

SOP Class Name	SOP Class UID
Storage Commitment Push Model	1.2.840.10008.1.20.1

Table 9 : Storage SOP Classes as SCP

SOP Class Name	SOP Class UID
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital Intra Oral X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra Oral X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
Digital Mammography X-ray Image Storage For Present.	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2
PET Image Storage	1.2.840.10008.5.1.4.1.1.128
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
RETIRED Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.5
RETIRED Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6
RETIRED Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Stored Print Storage	1.2.840.10008.5.1.1.27
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2

Table 10 : Print SOP Class as SCP

SOP Class Name	SOP Class UID
BasicFilmSession	1.2.840.10008.5.1.1.1
BasicFilmBox	1.2.840.10008.5.1.1.2
BasicGrayscaleImageBox	1.2.840.10008.5.1.1.4
BasicColorImageBox	1.2.840.10008.5.1.1.4.1
Printer	1.2.840.10008.5.1.1.16

3.1.1 Association establishment Policies

3.1.1.1 General

The following Application Context Name will be proposed and recognized by DIAM4 Server

- DICOM 3.0 Application Context 1.2.840.10008.3.1.1.1

3.1.1.2 Number of Associations

The maximum number of association accepted or maintained by DIAM4 Server is limited only by the physical memory of the machine on which it runs. Typically it can be up to 20.

3.1.1.3 Asynchronous nature

DIAM^4 Server allows a single outstanding operation on any association. Therefore, DIAM^4 Server does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

3.1.1.4 Implementation Identifying Information

DIAM^4 Server will respond with the following implementation identifying parameters:

Implementation Class UID 1.2.826.0.1.3680043.2.406.0001
The last number of the implementation class UID is the machine serial number.

Implementation Version Name GIOL_DIAM_400
The implementation version name policies are the following: product name “GIOL_DIAM_” followed by the version of the product, “400” (meaning “version 4.0.0”).

3.1.2 Association Initiation by Real World Activity

3.1.2.1 Real World Activity – Find

3.1.2.1.1 Associated Real World Activity – Find

DIAM[4] Server will issue a FIND request when a user of DIAM[4] Server wishes to view patient and study information from a remote DICOM SCP.

3.1.2.1.2 Presentation context Table – Find

DIAM[4] Server supports the transfer syntaxes listed in Table 11. For a QUERY request, DIAM[4] Server supports the Presentation Contexts listed in Table 12.

Table 11 : Query Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 12 : Query Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Study Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.2.1	all from Table 11	SCU	None

3.1.2.1.3 SOP Specific conformance – Find

DIAM[4] Server supports the following search keys.

Table 13 : Patient level attributes

Description	Tag
Patient name	(0x0010, 0x0010)
Patient id	(0x0010, 0x0020)

Table 14 : Study level attributes

Description	Tag
Study id	(0x0020, 0x0010)
Study date	(0x0008, 0x0020)
Study time	(0x0008, 0x0010)
Accession number	(0x0008, 0x0050)
Modalities in Study	(0x0008, 0x0061)
Referring Physician's Name	(0x0008, 0x0090)
Study Description	(0x0008, 0x1030)
Study Instance UID	(0x0020, 0x000D)

Table 15 : Series level attributes

Description	Tag
Series instance UID	(0x0020, 0x000E)
Series number	(0x0020, 0x0011)
Modality	(0x0008, 0x0060)
Series Description	(0x0008, 0x103e)
Request Attribute Sequence	(0x0040, 0x0275)
> Requested Procedure ID	(0x0040, 0x1001)
> Scheduled Procedure Step ID	(0x0040, 0x0009)
Performed Procedure Step Start Date	(0x0040, 0x0244)
Performed Procedure Step Start Time	(0x0040, 0x0245)

Table 16 : Composite Object Instance Level attributes

Description	Tag
SOP instance UID	(0x0008, 0x0018)
Instance Number	(0x0020, 0x0013)

Table 17 : SR Document Specific Level attributes

Description	Tag
Completion Flag	(0x0040, 0xA491)
Verification Flag	(0x0040, 0xA493)
Verifying Observer Sequence	(0x0040, 0xA073)
> Verification DateTime	(0x0040, 0xA030)
> Verifying Observer Name	(0x0040, 0xA075)
Concept Name Code Sequence	(0x0040, 0xA043)
> Code Value	(0x0008, 0x0100)
> Coding Scheme Designator	(0x0008, 0x0102)

Table 18 : Key Object Document Specific Level attributes

Description	Tag
Concept Name Code Sequence	(0x0040, 0xA043)
> Code Value	(0x0008, 0x0100)
> Coding Scheme Designator	(0x0008, 0x0102)

Table 19 : Presentation State Specific Level attributes

Description	Tag
Content Label	(0x0070, 0x0080)
Content Description	(0x0070, 0x0081)
Presentation Creation Date	(0x0070, 0x0082)
Presentation Creation time	(0x0070, 0x0083)
Presentation Creator's Name	(0x0070, 0x0084)
Referenced Series Sequence	(0x0008, 0x1115)
> Series Instance UID	(0x0020, 0x000E)
> Referenced Image Sequence	(0x0008, 0x1140)
> >Referenced SOP Class UID	(0x0008, 0x1150)
> >Referenced SOP Instance UID	(0x0008, 0x1155)

3.1.2.2 Real World Activity - Move Images

3.1.2.2.1 Associated Real World Activity – Move Images

DIAM[4] Server will issue a MOVE request when a user of DIAM[4] Server wishes to move one or more studies / series from a remote DICOM SCP back to DIAM[4] Server (retrieve) or another remote DICOM SCP.

3.1.2.2.2 Presentation context Table – Move

DIAM[4] Server supports the transfer syntaxes listed in Table 20. For a MOVE request, DIAM[4] Server supports the Presentation Contexts listed in Table 21.

Table 20 : Move Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 21 Move Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Study Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.2.2	all from Table 20	SCU	None

3.1.2.2.3 SOP Specific Conformance – Move

See SOP Specific Conformance – Storage SCU.

3.1.2.3 Real World Activity - Storage as SCU

3.1.2.3.1 Associated Real World Activity – Storage as SCU

DIAM[4] Server will issue a Storage request when a user of DIAM[4] wishes to send a study of images to a remote DICOM SCP.

3.1.2.3.2 Presentation context Table – Storage as SCU

DIAM[4] Server supports the transfer syntaxes listed in Table 22. For a Storage request, DIAM[4] Server supports the Presentation Contexts listed in Table 23.

Table 22 : Storage Transfer Syntaxes

Transfer Syntax	UID
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2
DICOM Lossy JPEG 8 Bit – JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
DICOM JPEG Lossless, hierarchical, first order prediction (Process 14)	1.2.840.10008.1.2.4.70
RLE Lossless Transfer Syntax	1.2.840.10008.1.2.5

3.1.2.3.3 SOP Specific Conformance – Storage as SCU

Table 23 : Storage Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	all from Table20	SCU	None

CT Image Storage	1.2.840.10008.5.1.4.1.1.2	all from Table20	SCU	None
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	all from Table20	SCU	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	all from Table20	SCU	None
Digital Intra Oral X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.3	all from Table20	SCU	None
Digital Intra Oral X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	all from Table20	SCU	None
Digital Mammography X-ray Image Storage For Present.	1.2.840.10008.5.1.4.1.1.1.2	all from Table20	SCU	None
Digital Mammography X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	all from Table20	SCU	None
Digital X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1	all from Table20	SCU	None
Digital X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	all from Table20	SCU	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	all from Table20	SCU	None
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	all from Table20	SCU	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	all from Table20	SCU	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	all from Table20	SCU	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	all from Table20	SCU	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	all from Table20	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	all from Table20	SCU	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	all from Table20	SCU	None
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	all from Table20	SCU	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	all from Table20	SCU	None
RETIRED Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.5	all from Table20	SCU	None
RETIRED Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6	all from Table20	SCU	None
RETIRED Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3	all from Table20	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	all from Table20	SCU	None
Stored Print Storage	1.2.840.10008.5.1.1.27	all from Table20	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	all from Table20	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	all from Table20	SCU	None
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	all from Table20	SCU	None
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	all from Table20	SCU	None
Raw data	1.2.840.10008.5.1.4.1.1.66	all from Table20	SCU	None
VL photographic	1.2.840.10008.5.1.4.1.1.77.1.4	all from Table20	SCU	None

3.1.2.4 Real World Activity – Storage Commitment

3.1.2.4.1 Associated Real World Activity – Storage Commitment

DIAM[4] Server stores images that are sent to it from an SCU. In some configurations (eg cache-only), DIAM[4] Server may send images to another SCP (eg a PACS) for permanent storage. The request for storage commitment may then be transmitted from DIAM[4] Server together with a list of references to one or more SOP instances. This action is invoked through the DIMSE N-ACTION primitive. The following message is supported:

- Request Storage Commitment - to request the safekeeping of a set of SOP instances

3.1.2.4.2 Presentation Context Table – Storage Commitment

DIAM[4] Server supports the transfer syntaxes listed in Table 24. For a Storage Commitment request, DIAM4 Server supports the Presentation Contexts listed in Table 25.

Table 24 : Storage Commitment Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 25 : Storage Commitment Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	**SOP Class UID**			
Storage Commitment Push Model	1.2.840.10008.1.20.1	all from Table 23	SCU	None

3.1.2.4.3 SOP Specific Conformance – Storage Commitment

DIAM[4] Server provides standard conformance to the DICOM **Storage Commitment** Service Class.

DIAM[4] Server supports the following elements for this SOP class as a SCU. The Transaction UID Attribute (0008,1195) value generated by DIAM[4] Server uniquely identifies each Storage Commitment Request.

Table 26 :Storage Commitment Request – Action Information

Action Type Name	Action Type ID	Attribute Name	Tag
Request Storage Commitment	1	Transaction UID	(0008,1195)
		Referenced SOP Sequence	(0008,1199)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)

Subsequently, DIAM[4] Server expects N-EVENT-REPORT from the SCP. DIAM[4] Server returns an N-EVENT-REPORT response primitive.

3.1.2.5 Real World Activity – Print as SCU

3.1.2.5.1 Associated Real World Activity – Print as SCU

DIAM[4] Server will issue a Print request when a user of DIAM[4] wishes to send images to a remote DICOM Printer SCP.

3.1.2.5.2 Presentation context Table – Print as SCU

DIAM[4] Server supports the transfer syntaxes listed in Table 27 for a Print request; DIAM[4] Server supports the Presentation contexts listed in Table 27.

Table 27 : Print Transfer Syntaxes

Transfer Syntax	UID
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1

3.1.2.5.3 SOP specific Conformance – Print as SCU

Table 28 : Print Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
BasicFilmSession	1.2.840.10008.5.1.1.1	all from Table 27	SCU	None
BasicFilmBox	1.2.840.10008.5.1.1.2	all from Table 27	SCU	None
BasicGrayscaleImageBox	1.2.840.10008.5.1.1.4	all from Table 27	SCU	None
BasicColorImageBox	1.2.840.10008.5.1.1.4.1	all from Table 27	SCU	None
Printer	1.2.840.10008.5.1.1.16	all from Table 27	SCU	None

3.1.2.6 Real World Activity – MPPS as SCU

3.1.2.6.1 Associated Real World Activity – MPPS SCU

DIAM[4] Server will issue a Modality Performed Procedure Step request each time it receives valid MPPS N-CREATE or N-SET messages from other DICOM systems. These messages are routed to all MPPS destinations configured in DIAM[4] Server.

3.1.2.6.2 Presentation context Table – MPPS SCU

DIAM4 Server will accept any of the transfer syntaxes listed in Table 55. DIAM4 Server will accept any of the Presentation Contexts listed in Table 56.

3.1.2.6.3 SOP Specific Conformance – MPPS SCU

DIAM4 Server supports the elements MPPS N-CREATE request as an SCU, contained in table 57 ; it also supports the elements MPPS N-SET request as an SCU, contained in table 58.

3.1.3 Association Acceptance Policy

3.1.3.1 Real World Activity – Verification

3.1.3.1.1 Associated Real World Activity – Verification

DIAM[4] Server will respond to Verification requests provided by SCU with the ability to determine if DIAM[4] Server can receive DICOM requests.

3.1.3.1.2 Presentation Context Table – Verification

DIAM[4] Server supports the transfer syntaxes listed in Table 29. DIAM[4] Server will accept any of the Presentation Contexts listed in Table 30 for Verification.

Table 29 : Verification Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 30 : Verification Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Verification	1.2.840.10008.1.1	all from Table 29	SCP	None

3.1.3.1.3 SOP Specific Conformance – Verification

DIAM[4] Server provides standard conformance to the DICOM Verification Service Class. DIAM[4] Server returns one of the following status codes.

Table 31 : Verification status codes.

Service Status	Further Meaning	Protocol Codes	Related Fields	Description

Error	Failed	C000		The operation was not successful.
Success	Success	0000		Operation performed properly.

3.1.3.1.4 Presentation Context Acceptance Criterion – Verification

DIAM[4] Server will always accept a Presentation Context for the Verification SOP Class with the default DICOM transfer syntax listed in Table 29.

3.1.3.1.5 Transfer Syntax Selection Policies – Verification

Since no DICOM data object is associated with a Verification command, only the default DICOM transfer syntax is required/supported.

3.1.3.2 Real World Activity - Storage as SCP

3.1.3.2.1 Associated Real World Activity – Storage as SCP

DIAM[4] Server will archive images that are sent to it from an SCU.

3.1.3.2.2 Presentation Context Table – Storage as SCP

DIAM4 Server supports the following transfer syntaxes listed in Table 32. DIAM4 Server supports any of the Presentation Contexts listed in Table 33 for Storage.

Table 32 : Storage Transfer Syntaxes

Transfer Syntax	UID
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2
DICOM Lossy JPEG 8 Bit – JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
DICOM JPEG Lossless, hierarchical, first order prediction (Process 14)	1.2.840.10008.1.2.4.70
RLE Lossless Transfer Syntax	1.2.840.10008.1.2.5

Table 33 : Storage Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	**SOP Class UID**			
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11	all from Table 23	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	all from Table 23	SCP	None
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33	all from Table 23	SCP	None
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1	all from Table 23	SCP	None
Digital Intra Oral X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.3	all from Table 23	SCP	None
Digital Intra Oral X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	all from Table 23	SCP	None
Digital Mammography X-ray Image Storage For Present.	1.2.840.10008.5.1.4.1.1.1.2	all from Table 23	SCP	None
Digital Mammography X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.2.1	all from Table 23	SCP	None
Digital X-ray Image Storage For Presentation	1.2.840.10008.5.1.4.1.1.1.1	all from Table 23	SCP	None
Digital X-ray Image Storage For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	all from Table 23	SCP	None
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1	all from Table 23	SCP	None
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22	all from Table 23	SCP	None
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1	all from Table 23	SCP	None
Hardcopy Color Image Storage	1.2.840.10008.5.1.1.30	all from Table 23	SCP	None
Hardcopy Grayscale Image Storage	1.2.840.10008.5.1.1.29	all from Table 23	SCP	None
Key Object Selection Document	1.2.840.10008.5.1.4.1.1.88.59	all from Table 23	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	all from Table 23	SCP	None
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2	all from Table 23	SCP	None
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	all from Table 23	SCP	None
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20	all from Table 23	SCP	None
RETIRED Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.5	all from Table 23	SCP	None
RETIRED Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6	all from Table 23	SCP	None
RETIRED Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3	all from Table 23	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	all from Table 23	SCP	None
Stored Print Storage	1.2.840.10008.5.1.1.27	all from Table 23	SCP	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	all from Table 23	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	all from Table 23	SCP	None
X-ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	all from Table 23	SCP	None
X-ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	all from Table 23	SCP	None

3.1.3.2.3 SOP Specific Conformance – Storage as SCP

DIAM[4] Server conforms to the DICOM Storage Service Class at Level 2 (Full). No elements are discarded or coerced by DIAM[4] Server. DIAM[4] Server returns one of the following status codes (Table 34).

Table 34 : Storage status codes

Service Status	Further Meaning	Protocol Codes	Related Fields	Description
Refused	Out of resources	A700		Indicates that there was not enough storage space to store the image. Recovery from this condition is left to the administrative functions available in.
	SOP Class not supported	A800		Indicates that the SOP Class of the Image in the C-Store operation did not match the Abstract Syntax negotiated for the Presentation Context.
Error	Data set does not match SOP Class	A900		Indicates that the Data Set does not encode an instance of the SOP Class specified.
	Failed	C000		The operation was not successful.
	Cannot understand	C005		Indicates that the Data Set cannot be parsed into elements by
Warning	Coercion of data elements	B000		Data elements were modified before being stored.
	Data set does not match SOP Class	B007		Indicates that the Data Set does not match the SOP Class, but that the image was stored anyway.
	Elements Discarded	B006		Indicates that some of the elements of the Data Set were discarded.
	Duplicate SOP Instance UID	D000		Indicates that the SOP Instance UID of the specified image is already stored in the database.
Success	Success	0000		Operation performed properly.

3.1.3.2.4 Presentation Context Acceptance Criterion – Storage as SCP

DIAM[4] Server will accept any number of Storage Presentation Contexts per association request. Any Abstract Syntax may be specified more than once in an association request, if the Transfer Syntaxes differ between the Presentation Contexts.

3.1.3.3 Real World Activity – Find

3.1.3.3.1 Associated Real World Activity – Find

DIAM[4] Server will respond to query requests that are sent to it from an SCU.

3.1.3.3.2 Presentation Context Table – Find

DIAM[4] Server will accept any of the transfer syntaxes listed in Table 35. For a QUERY request, DIAM[4] Server will accept any of the Presentation Contexts listed in Table 36.

Table 35 : Find Transfer Syntaxes

Transfer Syntax	UID

DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 36 : Find Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Patient Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.1.1	all from Table 35	SCP	See Note 1
Study Root Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.2.1	all from Table 35	SCP	See Note 1
Patient Study Only Query/Retrieve IM Find	1.2.840.10008.5.1.4.1.2.3.1	all from Table 35	SCP	See Note 1

Note 1: Find Extended Negotiation will be supported. DIAM[4] Server will negotiate with the following information:

Table 37 : Find Extended Negotiation

Field Name	Value	Description of Field
Relational queries	1	Relational queries supported

3.1.3.3.3 SOP Specific Conformance – Find

SOP classes of the Query/Retrieve Service Class are implemented via the DIMSE C-FIND and C-MOVE services as defined in Part 7 of the DICOM standard.

DIAM[4] Server supports hierarchical queries. DIAM[4] Server supports relational queries. DIAM[4] Server, by default, supports all mandatory search keys.

Table 38 : Patient level attributes

Description	Tag
Patient name	(0x0010, 0x0010)
Patient id	(0x0010, 0x0020)

Table 39 : Study level attributes

Description	Tag
Study id	(0x0020, 0x0010)
Study date	(0x0008, 0x0020)
Study time	(0x0008, 0x0010)
Accession number	(0x0008, 0x0050)
Modalities in Study	(0x0008, 0x0061)
Referring Physician's Name	(0x0008, 0x0090)
Study Description	(0x0008, 0x1030)
Study Instance UID	(0x0020, 0x000D)

Table 40 : Series level attributes

Description	Tag
Series instance UID	(0x0020, 0x000E)
Series number	(0x0020, 0x0011)
Modality	(0x0008, 0x0060)
Series Description	(0x0008, 0x103e)

Request Attribute Sequence	(0x0040, 0x0275)
> Requested procedure ID	(0x0040, 0x1001)
>Scheduled Procedure Step ID	(0x0040, 0x0009)
Performed Procedure Step Start Date	(0x0040, 0x0244)
Performed Procedure Step Start Time	(0x0040, 0x0245)

Table 41 : Composite Object Instance Level

Description	Tag
SOP instance UID	(0x0008, 0x0018)
SOP Class UID	(0x0008, 0x0016)
Instance Number	(0x0020, 0x0013)

Table 42 : SR Document Specific Level

Description	Tag
Completion Flag	(0x0040, 0xA491)
Verification Flag	(0x0040, 0xA493)
Verifying Observer Sequence	(0x0040, 0xA073)
> Verification DateTime	(0x0040, 0xA030)
> Verifying Observer Name	(0x0040, 0xA075)
Concept Name Code Sequence	(0x0040, 0xA043)
> Code Value	(0x0008, 0x0100)
> Coding Scheme Designator	(0x0008, 0x0102)

Table 43 : Key Object Document Specific Level

Description	Tag
Concept Name Code Sequence	(0x0040, 0xA043)
> Code Value	(0x0008, 0x0100)
> Coding Scheme Designator	(0x0008, 0x0102)

Table 44 : Presentation State Specific Level attributes

Description	Tag
Content Label	(0x0070, 0x0080)
Content Description	(0x0070, 0x0081)
Presentation Creation Date	(0x0070, 0x0082)
Presentation Creation time	(0x0070, 0x0083)
Presentation Creator's Name	(0x0070, 0x0084)
Referenced Series Sequence	(0x0008, 0x1115)
> Series Instance UID	(0x0020, 0x000E)
> Referenced Image Sequence	(0x0008, 0x1140)
>>Referenced SOP Class UID	(0x0008, 0x1150)
>>Referenced SOP Instance UID	(0x0008, 0x1155)

DIAM[4] Server returns one of the following status codes to a C-FIND request.

Table 45 : C-FIND status codes

Service Status	Further Meaning	Protocol Codes	Related Fields	Description
Refused	Out of Resources	A700		
Failed	Identifier does not match SOP Class	A900		The specified identifier contains a request that does not match the specified SOP Class.
	Unable to process	C001		For some reason (database off-line?) we cannot process this request at this time.
Cancel	Matching terminated due to Cancel Request	FE00		The original requester canceled this operation.
Pending	Pending	FF00		All Optional Keys are supported in the same manner as Required Keys.
	Pending	FF01		The matching operation is continuing. Warning that one or more Optional Keys were not supported in the same manner as Required Keys.
Success	Success	0000		Operation performed properly.

3.1.3.3.4 Presentation Context Acceptance Criterion - Find

DIAM[4] Server will accept any number of Find Presentation Contexts per association request. Any Abstract Syntax may be specified more than once in an association request, if the Transfer Syntaxes differ between the Presentation Contexts.

3.1.3.4 Real World Activity – Move

3.1.3.4.1 Associated Real World Activity - Move

DIAM[4] Server will respond to retrieve requests that are sent to it from an SCU.

3.1.3.4.2 Presentation Context Table – Move

DIAM[4] Server will accept any of the transfer syntaxes listed in Table 46. For a MOVE request, DIAM[4] Server will accept any of the Presentation Contexts listed in Table 47.

Table 46 : Move Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 47 : Move Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Patient Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.1.2	all from Table 45	SCP	See note 2
Study Root Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.2.2	all from Table 45	SCP	See note 2
Patient/Study Only Query/Retrieve IM Move	1.2.840.10008.5.1.4.1.2.3.2	all from Table 45	SCP	See note 2

Note 2: Move Extended Negotiation will be supported. DIAM[4] Server will negotiate with the following information:

Table 48 : Move Extended Negotiation

Field Name	Value	Description of Field
Relational-retrieval	1	Relational retrieval supported

3.1.3.4.3 SOP Specific Conformance - Move

DIAM[4] Server will try to establish an association with the move destination specified in the Move request. One or more of the Presentation Contexts listed in the Store section of this document may be negotiated in this association.

DIAM[4] Server returns one of the following status codes to a C-MOVE request.

Table 49 : C-MOVE status codes

Service Status	Further Meaning	Protocol Codes	Related Fields	Description
Refused	Out of Resources	A701		Unable to calculate number of matches.
	Out of Resources	A702		Unable to perform storage of images to move destination.
Failed	Move destination unknown	A801		The destination of this move request is unknown.
	Identifier does not match SOP Class	A900		The specified identifier contains a request that does not match the specified SOP Class.
	Unable to process	C002		Indicates that Diam4 cannot process this request at this time.
Cancel	Storage terminated due to Cancel Request	FE00		The original requester canceled this operation.
Warning	Warning	B000		Storage complete with one or more failures.
Pending	Pending	FF00		The storage operation is continuing.
	Pending for a long time	FF02		This operation is expected to require a long period of time to complete. The SCU may break the association at any time, but the operation will continue to completion.
Success	Success	0000		Operation performed properly.

3.1.3.4.4 Presentation Context Acceptance Criterion - Move

DIAM[4] Server will accept any number of Move Presentation Contexts per association request. Any Abstract Syntax may be specified more than once in an association request, if the Transfer Syntaxes differ between the Presentation Contexts.

3.1.3.4.5 Transfer Syntax Selection Policies - Move

By default, DIAM[4] Server sends the IOD using the transfer syntax that was used when the image was originally stored.

3.1.3.5 Real World Activity – Storage Commitment

3.1.3.5.1 Associated Real World Activity – Storage Commitment

DIAM[4] Server stores images that are sent to it from an *SCU*. The request for storage commitment may then be transmitted to DIAM[4] Server together with a list of references to one or more SOP instances. DIAM[4] Server will receive and respond to DIMSE N-ACTION. The following message is supported:

- Request Storage Commitment - to request the safekeeping of a set of SOP instances

3.1.3.5.2 Presentation Context Table – Storage Commitment

DIAM[4] Server will accept any of the transfer syntaxes listed in Table 50. For a Storage commitment request, DIAM[4] Server will accept any of the Presentation Contexts listed in Table 51.

Table 50 : Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1
DICOM Explicit VR Big Endian Transfer Syntax	1.2.840.10008.1.2.2

Table 51 : Storage Commitment Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	**SOP Class UID**			
Storage Commitment Push Model	1.2.840.10008.1.20.1	all from Table 50	SCP	None

3.1.3.5.3 SOP Specific Conformance – Storage Commitment

DIAM[4] Server supports the following elements for this SOP class as an SCP:

Table 52: Storage Commitment Request – Action Information

Action Type Name	Action Type ID	Attribute Name	Tag
Request Storage Commitment	1	Transaction UID	(0008,1195)
		Referenced SOP Sequence	(0008,1199)
		> Referenced SOP Class UID	(0008,1150)
		> Referenced SOP Instance UID	(0008,1155)

DIAM[4] Server returns one of the following status codes:

Table 53 : Storage Commitment status codes

Service Status	Further Meaning	Protocol Codes	Related Fields	Description
Error	Failed	C000		The operation was not successful.
Success	Success	0000		Operation performed properly.

3.1.3.5.4 Result – Storage Commitment

If DIAM[4] Server determines that it has successfully completed storage commitment, DIAM[4] Server issues an N-EVENT-REPORT to the SCU including references to the successfully stored SOP Instances contained in the N-ACTION.
The N-EVENT-REPORT contains the Transaction UID value contained in the initiating N-ACTION. The N-EVENT-REPORT is sent on a separate association from the N-ACTION operation.
DIAM[4] Server supports the Event Information as specified in Table 54.

Table 54: Storage Commitment Result – Event Information

Action Type Name	Event Type ID	Attribute Name	Tag
Storage Commitment Request Successful	1	Transaction UID	(0008,1195)
		Referenced SOP Sequence	(0008,1199)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)
		Failed SOP Sequence	(0008,1198)
		>Referenced SOP Class UID	(0008,1150)
		>Referenced SOP Instance UID	(0008,1155)
		>Failure reason	(0008,1197)

In a cache-only configuration, DIAM[4] Server commits to storing a SOP Instance as long as there is available disk space. In this configuration, DIAM[4] Server may delete SOP Instances.

3.1.3.6 Real World Activity – MPPS as SCP

3.1.3.6.1 Associated Real World Activity – Modality Performed Procedure Step

If the functionality is activated in DIAM[4] settings, the DIAM[4] Server accepts MPPS messages from a remote AE. The messages are either N-CREATE or N-SET. The DIAM[4] Server is able to treat many incoming messages in the same time.

When the DIAM[4] Server receives a Modality Performed Procedure Step SOP Class N-CREATE request, it stores the information. When the DIAM[4] Server receives a Modality Performed Procedure Step SOP Class N-SET request, it updates the information.

Furthermore, these messages are forwarded to the configured peer applications.

3.1.3.6.2 Presentation Context Table – Modality Performed Procedure Step

DIAM[4] Server will accept any of the transfer syntaxes listed in Table 55. DIAM[4] Server will accept any of the Presentation Contexts listed in Table 56.

Table 55 : Transfer Syntaxes

Transfer Syntax	UID
DICOM Implicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2
DICOM Explicit VR Little Endian Transfer Syntax	1.2.840.10008.1.2.1

Table 56 : MPPS Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
SOP Class	SOP Class UID			
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	all from Table 55	SCP	None

3.1.3.6.3 SOP Specific Conformance – Modality Performed Procedure Step

When receiving a MPPS N-CREATE request, DIAM[4] Server creates a MPPS object with the "IN PROGRESS" status.

The content of the MPPS object is updated when receiving a MPPS N-SET request. The status is updated to either "IN PROGRESS" or “COMPLETED” or “DISCONTINUED”.

If DIAM[4] Server receives another MPPS N-SET request for this object it will accept if the current status in the database is "IN PROGRESS", else if this status is “COMPLETED” or “DISCONTINUED”, it will return an error code as described in table 59.

DIAM4 Server supports the following elements MPPS N-CREATE request as an SCP :

Table 57 : MPPS N-CREATE data elements

Description	Tag
Performed Procedure Step Relationship	
Patient’s Name	(0010,0010)
Patient ID	(0010,0020)
Patient’s Birth Date	(0010,0030)
Patient’s Sex	(0010,0040)
Referenced Patient Sequence	(0008,1120)
> Referenced SOP Class UID	(0008,1150)
> Referenced SOP Instance UID	(0008,1155)
Scheduled Step Attributes Sequence	(0040,0270)
> Study Instance UID	(0020,000D)
> Referenced Study Sequence	(0008,1110)
>> Referenced SOP Class UID	(0008,1150)
>> Referenced SOP Instance UID	(0008,1155)
> Accession Number	(0008,0050)
> Placer Order Number / Imaging Service Request	(0040,2016)
> Filler Order Number / Imaging Service Request	(0040,2017)
> Requested Procedure ID	(0040,1001)
> Requested Procedure Description	(0032,1060)
> Scheduled Procedure Step ID	(0040,0009)
> Scheduled Procedure Step Description	(0040,0007)
> Scheduled Protocol Code Sequence	(0040,0008)
>> Code Value	(0008,0100)
>> Coding Scheme Designator	(0008,0102)
>> Coding Scheme Version	(0008,0103)
>> Code Meaning	(0008,0104)
Performed Procedure Step Information	
Performed Station AE Title	(0040,0241)
Performed Station Name	(0040,0242)
Performed Location	(0040,0243)
Performed Procedure Step Start Date	(0040,0244)
Performed Procedure Step Start Time	(0040,0245)
Performed Procedure Step ID	(0040,0253)
Performed Procedure Step End Date	(0040,0250)
Performed Procedure Step End Time	(0040,0251)
Performed Procedure Step Status	(0040,0252)
Performed Procedure Step Description	(0040,0254)
Comments on the Performed Procedure Step	(0040,0280)
Performed Procedure Type Description	(0040,0255)

Procedure Code Sequence	(0008,1032)
> Code Value	(0008,0100)
> Coding Scheme Designator	(0008,0102)
> Coding Scheme Version	(0008,0103)
> Code Meaning	(0008,0104)
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)
> Code Value	(0008,0100)
> Coding Scheme Designator	(0008,0102)
> Coding Scheme Version	(0008,0103)
> Code Meaning	(0008,0104)
Image Acquisition Results	
Modality	(0008,0060)
Study ID	(0020,0010)
Performed Protocol Code Sequence	(0040,0260)
> Code Value	(0008,0100)
> Coding Scheme Designator	(0008,0102)
> Coding Scheme Version	(0008,0103)
> Code Meaning	(0008,0104)
Performed Series Sequence	(0040,0340)
> Performing Physician's Name	(0008,1050)
> Operator's Name	(0008,1070)
> Protocol Name	(0018,1030)
> Series Instance UID	(0020,000E)
> Series Description	(0008,103E)
> Retrieve AE Title	(0008,0054)
> Referenced Image Sequence	(0008,1140)
>> Referenced SOP Class UID	(0008,1150)
>> Referenced SOP Instance UID	(0008,1155)
> Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)
>> Referenced SOP Class UID	(0008,1150)
>> Referenced SOP Instance UID	(0008,1155)
All other attributes from Radiation Dose Module	
All other attributes from Billing and Material Code Module	

DIAM[4] Server supports the following elements MPPS N-SET request as an SCP:

Table 58 : MPPS N-SET data elements

Description	Tag
Performed Procedure Step Information	
Performed Procedure Step End Date	(0040,0250)
Performed Procedure Step End Time	(0040,0251)
Performed Procedure Step Status	(0040,0252)
Performed Procedure Step Description	(0040,0254)
Comments on the Performed Procedure Step	(0040,0280)
Performed Procedure Type Description	(0040,0255)
Procedure Code Sequence	(0008,1032)
> Code Value	(0008,0100)
> Coding Scheme Designator	(0008,0102)
> Coding Scheme Version	(0008,0103)
> Code Meaning	(0008,0104)
Performed Procedure Step Discontinuation Reason Code Sequence	(0040,0281)
> Code Value	(0008,0100)
> Coding Scheme Designator	(0008,0102)
> Coding Scheme Version	(0008,0103)
> Code Meaning	(0008,0104)
Image Acquisition Results	
Performed Protocol Code Sequence	(0040,0260)
> Code Value	(0008,0100)

> Coding Scheme Designator	(0008,0102)
> Coding Scheme Version	(0008,0103)
> Code Meaning	(0008,0104)
Performed Series Sequence	(0040,0340)
> Performing Physician's Name	(0008,1050)
> Operator's Name	(0008,1070)
> Protocol Name	(0018,1030)
> Series Instance UID	(0020,000E)
> Series Description	(0008,103E)
> Retrieve AE Title	(0008,0054)
> Referenced Image Sequence	(0008,1140)
>> Referenced SOP Class UID	(0008,1150)
>> Referenced SOP Instance UID	(0008,1155)
> Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)
>> Referenced SOP Class UID	(0008,1150)
>> Referenced SOP Instance UID	(0008,1155)
All other attributes from Radiation Dose Module	
All other attributes from Billing and Material Code Module	

DIAM[4] Server returns one of the following status codes.

Table 59 : MPPS N-SET status codes

Service Status	Further Meaning	Protocol Codes	Related Fields	Description
Failure	Processing Failure – Performed Procedure Step Object may no longer be updated	0110		No update can be performed if the status is "COMPLETED" or "DISCONTINUED"
Success	Success	0000		Operation performed properly.

3.1.4 Presentation State Display

DIAM[4] Server manages presentation states. It applies them to the related images when these images are displayed. The following specific presentation modules are supported:

Table 60 : Presentation State Module (C.11.10)

Attribute Name	Tag	Comments
Instance Number	(0020,0013)	
Content Label	(0070,0080)	
Content Description	(0070,0081)	
Presentation Creation Time	(0070,0083)	
Content Creator's Name	(0070,0084)	
>Series Instance UID	(0020,000E)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
Shutter Presentation Value	(0018,1622)	

Table 61 : Display Shutter Module (C.7.6.11)

Attribute Name	Tag	Comments
Shutter Shape	(0018,1600)	
Shutter Left Vertical Edge	(0018,1602)	
Shutter Right Vertical Edge	(0018,1604)	
Shutter Upper Horizontal Edge	(0018,1606)	
Shutter Lower Horizontal Edge	(0018,1608)	
Center of Circular Shutter	(0018,1610)	
Radius of Circular Shutter	(0018,1612)	
Vertices of the Polygonal Shutter	(0018,1620)	
Shutter Presentation Value	(0018,1622)	

N.B.: the Bitmap Display Shutter Module is not supported

Table 62 : Overlay Plane (C.9.2)

Attribute Name	Tag	Comments
Overlay Rows	(60xx,0010)	
Overlay Columns	(60xx,0011)	
Overlay Type	(60xx,0040)	Enumerated Values: G = Graphics R = ROI.
Overlay Origin	(60xx,0050)	
Overlay Bits Allocated	(60xx,0100)	
Overlay Bit Position	(60xx,0102)	
Overlay Data	(60xx,3000)	
Overlay Description	(60xx,0022)	
Overlay Label	(60xx,1500)	

Table 63 : Overlay/Curve Activation (C.11.7)

The activation of overlays is not supported: DIAM4 Server displays either all overlays of the image referenced, or none of them.

Table 64 : Displayed Area (C.10.4)

Attribute Name	Tag	Comments
Displayed Area Selection Sequence	(0070,005A)	
>Referenced Image Sequence	(0008,1140)	
> >Referenced SOP Class UID	(0008,1150)	
> >Referenced SOP Instance UID	(0008,1155)	
> >Referenced Frame Number	(0008,1160)	
>Displayed Area Top Left Hand Corner	(0070,0052)	
>Displayed Area Bottom Right Hand Corner	(0070,0053)	
>Presentation Size Mode	(0070,0100)	Enumerated Values: SCALE TO FIT TRUE SIZE MAGNIFY
>Presentation Pixel Spacing	(0070,0101)	
>Presentation Pixel Aspect Ratio	(0070,0102)	
>Presentation Pixel Magnification Ratio	(0070,0103)	

Table 65 : Graphic Annotation (C.10.5)

Attribute Name	Tag	Comments
Graphic Annotation Sequence	(0070,0001)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
>Graphic Layer	(0070,0002)	
>Text Object Sequence	(0070,0008)	
>>Bounding Box Annotation Units	(0070,0003)	
>>Anchor Point Annotation Units	(0070,0004)	
>>Unformatted Text Value	(0070,0006)	
>>Bounding Box Top Left Hand Corner	(0070,0010)	
>>Bounding Box Bottom Right Hand Corner	(0070,0011)	
>>Bounding Box Text Horizontal Justification	(0070,0012)	
>>Anchor Point	(0070,0014)	
>>Anchor Point Visibility (0070,0015)	(0070,0015)	
>Graphic Object Sequence	(0070,0009)	
>>Graphic Annotation Units	(0070,0005)	
>>Graphic Dimensions	(0070,0020)	
>>Number of Graphic Points	(0070,0021)	
>> Graphic Data	(0070,0022)	
>>Graphic Type	(0070,0023)	Type INTERPOLATED is not supported.
>>Graphic Filled	(0070,0024)	

Table 66 : Spatial Transformation (C.10.6)

Attribute Name	Tag	Comments
Image Rotation	(0070,0041)	
Image Horizontal Flip	(0070,0041)	

Table 67 : Modality LUT (C.11.1)

Attribute Name	Tag	Comments
Modality LUT Sequence	(0028,3000)	
>LUT Descriptor	(0028,3002)	
>LUT Explanation	(0028,3003)	
>Modality LUT Type	(0028,3004)	
>LUT Data	(0028,3006)	
Rescale Intercept	(0028,1052)	
Rescale Slope	(0028,1053)	
Rescale Type	(0028,1054)	

Table 68 : Softcopy VOI LUT (C.11.8)

Attribute Name	Tag	Comments
Softcopy VOI LUT Sequence	(0028,3110)	
>Referenced Image Sequence	(0008,1140)	
>>Referenced SOP Class UID	(0008,1150)	
>>Referenced SOP Instance UID	(0008,1155)	
>>Referenced Frame Number	(0008,1160)	
>VOI LUT Sequence	(0028,3010)	
>>LUT Descriptor	(0028,3002)	
>>LUT Explanation	(0028,3003)	
>>LUT Data	(0028,3006)	
>Window Center	(0028,1050)	
>Window Width	(0028,1051)	
>Window Center & Width Explanation	(0028,1055)	

Table 69 : Softcopy Presentation LUT (C.11.6)

Attribute Name	Tag	Comments
Presentation LUT Sequence	(2050,0010)	
>LUT Descriptor	(0028,3002)	
>LUT Explanation	(0028,3003)	
>LUT Data	(0028,3006)	
Presentation LUT Shape	(2050,0020)	

4 Communications Profiles

DIAM[4] Server provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.1 TCP / IP Stack

DIAM[4] Server inherits its TCP/IP stack from the computer system upon which it executes.

4.1.1 Physical Media Support

DIAM[4] Server is indifferent to the physical medium over which TCP/IP executes; it inherits the medium from the computer system upon which it executes.

5 Extensions / Specializations / Privatizations

6 Configuration

DIAM[4] Server obtains configuration information from the following sources:

Mapping from Application Entity Title to Presentation Address is provided by the database. Along with this mapping, the database stores those AE titles that are allowed to communicate with DIAM[4] Server.

7 Support for Extended Character Sets

DIAM[4] Server is known to support the following character sets:

ISO-IR 6 (default)	Basic G0 Set
ISO-IR 100	Latin Alphabet No. 1