

Technical Publications

**Direction 2002531-064
Revision 1**

Catalyst DICOM Service 1.1

CONFORMANCE STATEMENT for DICOM V3.0

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REVISION HISTORY

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1. INTRODUCTION

1.1 OVERVIEW

This DICOM Conformance Statement is divided into Sections as described below:

Section 1 (Introduction), which describes the overall structure, intent, and references for this Conformance Statement

Section 2 (Network Conformance Statement), which specifies the GEMS equipment compliance to the DICOM requirements for the implementation of Networking features.

Section 3 (Patient Root Query/Retrieve Information Model Definition), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Patient Root Query/Retrieve service.

Section 4 (Study Root Query/Retrieve Information Model Definition), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Study Root Query/Retrieve service.

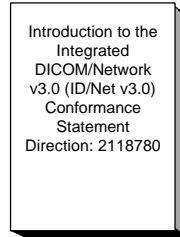
Section 5 (Patient/Study Only Query/Retrieve Information Model Definition), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Patient/Study only Query/Retrieve service.

Section 6 (Modality Worklist Query/Retrieve Information Model Definition), which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Modality Worklist Query/Retrieve service.

**1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT
STRUCTURE**

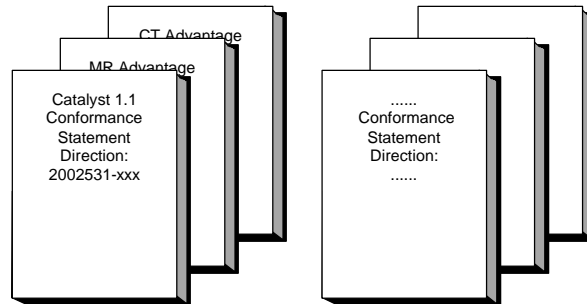
The Documentation Structure of the GEMS Conformance Statements and their relationship with the DICOM v3.0 Conformance Statements is shown in the Illustration below.

ID/Net v3.0



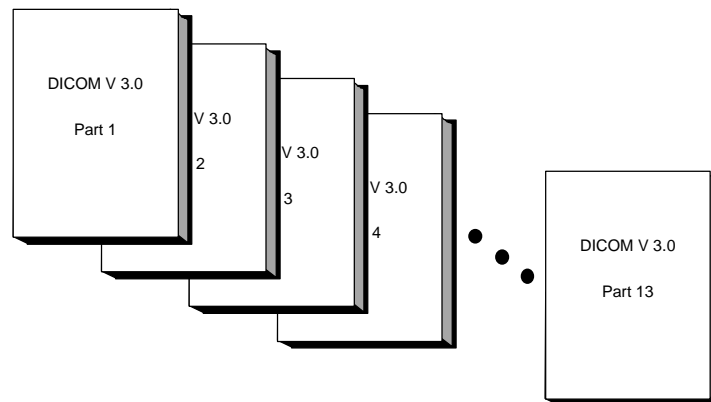
APPLICATION ENTITY SPECIFICATION
(SERVICE CLASSES, INFORMATION OBJECTS, MESSAGE EXCHANGES, ETC.)

Product Implementation:



DICOM STANDARD

Standard Specification:



This document specifies the DICOM v3.0 implementation. It is entitled:

Catalyst DICOM Service 1.1

*Conformance Statement for DICOM v3.0
Direction 2002531-xxx*

This DICOM Conformance Statement documents the DICOM v3.0 Conformance Statement and Technical Specification required to inter-operate with the GEMS network interface. Introductory information, which is applicable to all GEMS Conformance Statements, is described in the document:

*Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
Conformance Statement
Direction: 2118780.*

This Introduction familiarizes the reader with DICOM terminology and general concepts. It should be read prior to reading the individual products' GEMS Conformance Statements.

The GEMS Conformance Statement, contained in this document, also specifies the Lower Layer communications which it supports (e.g., TCP/IP). However, the Technical Specifications are defined in the DICOM v3.0 Part 8 standard.

For more information including Network Architecture and basic DICOM concepts, please refer to the Introduction.

For the convenience of software developers, there is "collector" Direction available. By ordering the collector, the Introduction described above and all of the currently published GEMS Product Conformance Statements will be received. The collector Direction is:

*ID/Net v3.0 Conformance Statements
Direction: 2117016*

For more information regarding DICOM v3.0, copies of the Standard may be obtained by written request or phone by contacting:

NEMA Publication
1300 North 17th Street
Suite 1847
Rosslyn, VA 22209
USA
Phone: (703) 841-3200

1.3 INTENDED AUDIENCE

The reader of this document is concerned with software design and/or system integration issues. It is assumed that the reader of this document is familiar with the DICOM v3.0 Standards and with the terminology and concepts which are used in those Standards.

If readers are unfamiliar with DICOM v3.0 terminology they should first refer to the document listed below, then read the DICOM v3.0 Standard itself, prior to reading this DICOM Conformance Statement document.

Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0)
Conformance Statement
Direction: 2118780

1.4 SCOPE AND FIELD OF APPLICATION

It is the intent of this document, in conjunction with the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780*, to provide an unambiguous specification for GEMS implementations. This specification, called a Conformance Statement, includes a DICOM v3.0 Conformance Statement and is necessary to ensure proper processing and interpretation of GEMS medical data exchanged using DICOM v3.0. The GEMS Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEMS devices are capable of using different Information Object Definitions. For example, a GEMS CT Scanner may send images using the CT Information Object, MR Information Object, Secondary Capture Object, etc.

Included in this DICOM Conformance Statement are the Module Definitions which define all data elements used by this GEMS implementation. If the user encounters unspecified private data elements while parsing a GEMS Data Set, the user is well advised to ignore those data elements (per the DICOM v3.0 standard). Unspecified private data element information is subject to change without notice. If, however, the device is acting as a "full fidelity storage device", it should retain and re-transmit all of the private data elements which are sent by GEMS devices.

1.5 IMPORTANT REMARKS

The use of these DICOM Conformance Statements, in conjunction with the DICOM v3.0 Standards, is intended to facilitate communication with GE imaging equipment. However, **by itself, it is not sufficient to ensure that inter-operation will be successful.** The **user (or user's agent)** needs to proceed with caution and address at least four issues:

- **Integration** - The integration of any device into an overall system of interconnected devices goes beyond the scope of standards (DICOM v3.0), and of this introduction and associated DICOM Conformance Statements when interoperability with non-GE equipment is desired. The responsibility to analyze the applications requirements and to design a solution that integrates GE imaging equipment with non-GE systems is the **user's** responsibility and should not be underestimated. The **user** is strongly advised to ensure that such an integration analysis is correctly performed.
- **Validation** - Testing the complete range of possible interactions between any GE device and non-GE devices, before the connection is declared operational, should not be overlooked. Therefore, the **user** should ensure that any non-GE provider accepts full responsibility for all validation required for their connection with GE devices. This includes the accuracy of the image data once it has crossed the interface between the GE imaging equipment and the non-GE device and the stability of the image data for the intended applications.

Such a validation is required before any clinical use (diagnosis and/or treatment) is performed. It applies when images acquired on GE imaging equipment are

processed/displayed on a non-GE device, as well as when images acquired on non-GE equipment is processed/displayed on a GE console or workstation.

- **Future Evolution** - GE understands that the DICOM Standard will evolve to meet the user's growing requirements. GE is actively involved in the development of the DICOM v3.0 Standard. DICOM v3.0 will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEMS protocol is based on DICOM v3.0 as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices which have implemented DICOM v3.0. **In addition, GE reserves the right to discontinue or make changes to the support of communications features (on its products) reflected on by these DICOM Conformance Statements.** The user should ensure that any non-GE provider, which connects with GE devices, also plans for the future evolution of the DICOM Standard. Failure to do so will likely result in the loss of function and/or connectivity as the DICOM Standard changes and GE Products are enhanced to support these changes.
- **To be informed of the evolution of the implementation described in this document, the User is advised to regularly check the GE Internet Server, accessible via anonymous ftp (GE Internet Server Address: ftp.med.ge.com, 192.88.230.11).**
- **Interaction** - It is the sole responsibility of the **non-GE provider** to ensure that communication with the interfaced equipment does not cause degradation of GE imaging equipment performance and/or function.

1.6 REFERENCES

A list of references which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.*

The information object implementation refers to DICOM PS 3.3 (Information Object Definition).

1.7 DEFINITIONS

A set of definitions which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.*

1.8 SYMBOLS AND ABBREVIATIONS

A list of symbols and abbreviations which is applicable to all GEMS Conformance Statements is included in the *Introduction to the Integrated DICOM/Network v3.0 (ID/Net v3.0) Conformance Statement, Direction: 2118780.*

2. NETWORK CONFORMANCE STATEMENT

2.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the compliance to DICOM conformance requirements for the relevant **Networking** features on this GEMS product. Note that the format of this section strictly follows the format defined in DICOM Standard PS 3.2 (Conformance). Please refer to that part of the standard while reading this section.

The Catalyst DICOM Service 1.1 is a combined hardware and software platform which provides high performance short term storage for digital medical images. It provides short term storage for image review by Catalyst clients.

The Catalyst DICOM Service is an open system, with all of its interfaces defined by international and industry standards. DICOM is the fundamental standard through which the Catalyst DICOM Service communicates with other devices. DICOM protocols are used for sending image data to the Catalyst DICOM Service for storage and archiving, for querying the image database, and for retrieving images.

2.2 IMPLEMENTATION MODEL

2.2.1 Application Data Flow Diagram

There is one Application Entity for each Catalyst DICOM Service that is used for all DICOM functionality. There is no default Application Entity Title for this application. Illustration 2 is a graphical depiction of the relationships between the Catalyst DICOM Service Application Entity (AE) and various Real-World Activities, as interrelated by DICOM.

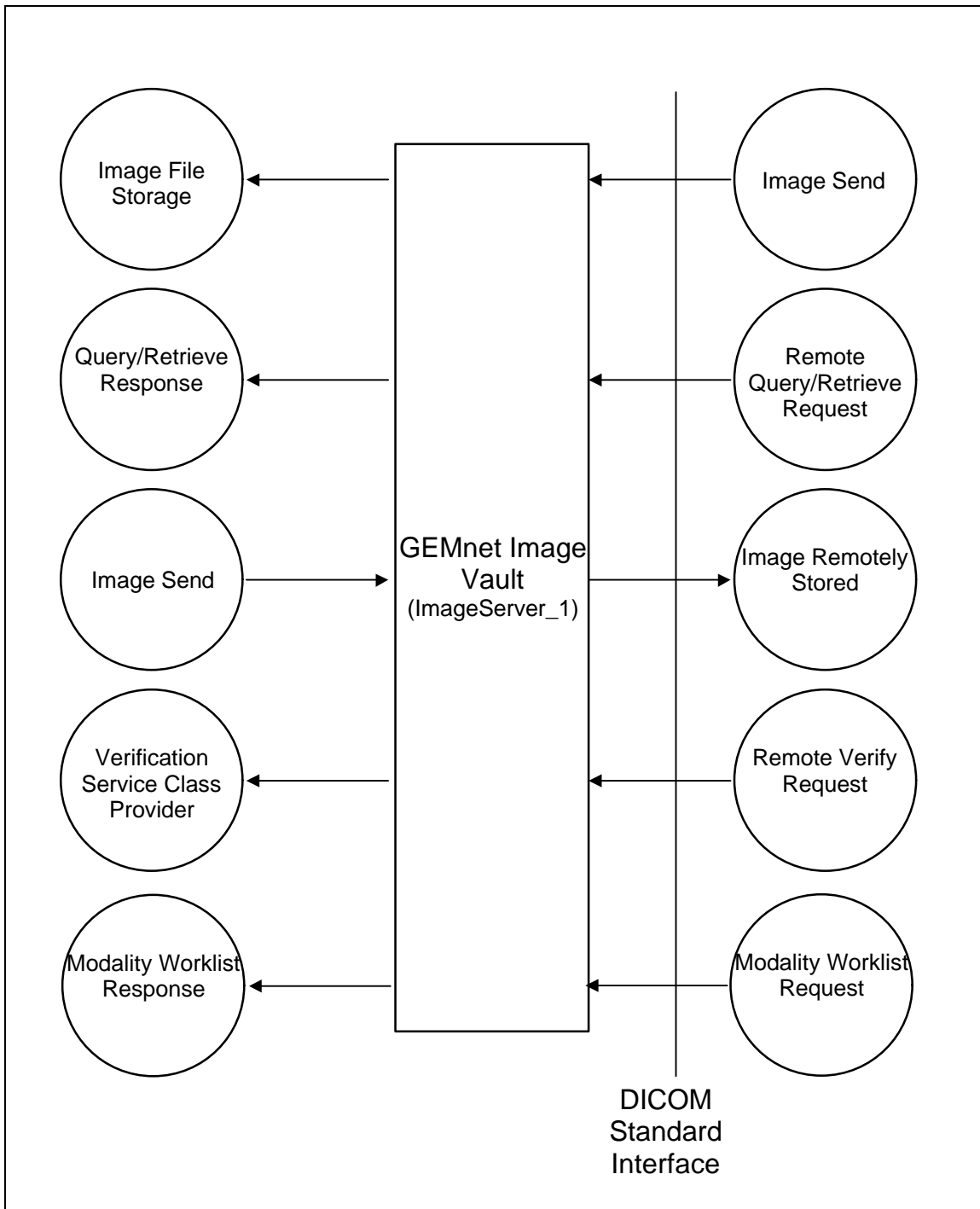


ILLUSTRATION 2: CATALYST DICOM SERVICE 1.1 IMPLEMENTATION MODEL DATA FLOW DIAGRAM

Remote Request for Image Archival is an activity which sends one or more images to the Catalyst DICOM Service to be archived. Image File Storage is a local automatic activity triggered by the DICOM transfer of images to the Catalyst DICOM Service for archive.

Remote Query/Retrieve Request and Image Remotely Stored are activities by which an external user can identify images stored by the Catalyst DICOM Service and retrieve specific images or sets of images. The Catalyst DICOM Service Query/Retrieve Response activity provides information about images stored by the Catalyst DICOM Service and initiates the return DICOM Association to the external Remote Retrieve activity or the Remote Image Stored activity for the transfer of the requested images.

An external Verify Request activity may use a DICOM Association to verify the ability of the Catalyst DICOM Service to respond to DICOM messages.

2.2.2 Functional Definition of AE's

The Catalyst DICOM Service contains one Application Entity. It provides a short term storage service for medial images.

Standard DICOM network communications is used to send images to the Catalyst DICOM Service for storage (Storage Service), to query for information about stored images (Query Service), and to retrieve stored images (Retrieve and Storage Services). The Catalyst DICOM Service initiates and responds to DICOM echo requests (Verification Service).

2.2.3 Sequencing of Real-World Activities

The only sequencing constraints are those which arise from the required existence of data prior to its access (e.g., images must be stored prior to their access through the Remote Query/Retrieve Request activity).

2.3 AE SPECIFICATIONS

2.3.1 AE Specification

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

SOP Class Name	SOP Class UID
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
NM Image Storage	1.2.840.10008.5.1.4.1.1.20

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP :

SOP Class Name	SOP Class UID
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
NM Image Storage	1.2.840.10008.5.1.4.1.1.20
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
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.3.2
Modality Worklist Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.31
Verification SOP Class	1.2.840.10008.1.1

2.3.1.1 Association Establishment Policies

2.3.1.1.1 General

The DICOM Application Context Name (ACN), which is always proposed, is:

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

The Maximum Length PDU negotiation is included in all association establishment requests.

The maximum length PDU for an association initiated by the Catalyst DICOM Service:

Maximum Length PDU	65 536 bytes
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SOP Class Extended Negotiation is not supported.

The maximum number of Presentation Context Items that will be proposed is 8.

The user information Items sent by this product are:

- Maximum PDU Length
- Implementation UID
- Implementation Version Name

2.3.1.1.2 Number of Associations

The Catalyst DICOM Service supports multiple associations both as an SCU and SCP. By default the maximum number of simultaneous associations that the Service will support as an SCP is 24.

2.3.1.1.3 Asynchronous Nature

Asynchronous mode is not supported. All operations will be performed synchronously.

2.3.1.1.4 Implementation Identifying Information

The Implementation UID for this DICOM v3.0 Implementation is:

Catalyst DICOM Service Implementation UID	1.2.840.113934.2002531.1.1.7
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The Implementation Version Name for this DICOM v3.0 Implementation is:

Catalyst DICOM Service Implementation Version Name	Catalyst SCP 1.1
---	-------------------------

2.3.1.2 Association Initiation Policy

The Catalyst DICOM Service Application Entity attempts to initiate an association to support the C-MOVE sub-operation. In other words, the only case of real-world activity which causes the Catalyst DICOM Service Application Entity to initiate the establishment of an association include:

- to handle the storage sub-operations in response to a retrieval request.

2.3.1.2.1 Real-World Activity: Remote Image Storage

2.3.1.2.1.1 Associated Real-World Activity

The Catalyst DICOM Service Application Entity will establish an association in response to a Retrieve SOP Class (MOVE) request received from the Query/Retrieve Request Real-World Activity. The target Real-World Activity is an external Image Receive.

2.3.1.2.1.2 Proposed Presentation Context Table

The Catalyst DICOM Service Application Entity will propose Presentation Contexts for each Transfer Syntax/Abstract Syntax combination listed in Table 1. All combinations will be proposed on each association, regardless of the specific Abstract Syntax of the SOP Instances which are to be transmitted.

TABLE 1: PROPOSED PRESENTATION CONTEXTS FOR CATALYST DICOM SERVICE IMAGE STORAGE

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
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2.3.1.2.1.2.1 SOP Specific DICOM Conformance Statement for all Storage SOP Classes

The Catalyst DICOM Service does not support Storage SOP Class Extended Negotiation.

Image objects transferred under the Storage SOP Classes may have optional Type 3 data elements as implemented by the sources of those images, and included in the image objects archived in the Catalyst Database.

2.3.1.3 Association Acceptance Policy

The Catalyst DICOM Service Application Entity will accept an association at any time, consistent with the maximum number of simultaneous associations as described in Section 1.2.1.1.2.

The Catalyst DICOM Service Application Entity accepts the establishment of an association in these cases of Real-World Activity:

- to support a remote Application Entity verifying the connectivity and responsiveness of the Catalyst DICOM Service Application Entity,
- to receive images for archive from a remote Application Entity,
- to support query/retrieve requests from a remote Application Entity.

2.3.1.3.1 Real-World Activity: Verification

2.3.1.3.1.1 Associated Real-World Activity

The Catalyst DICOM Service Application Entity will accept an association from a remote Application Entity to verify the ability of the Catalyst DICOM Service to respond to DICOM messages (Verification Real-World Activity).

2.3.1.3.1.2 Accepted Presentation Context Table

The Catalyst DICOM Service will accept the Presentation Contexts for the Verification activity as shown in Table 2. A single association may be used both for this activity and for any of the other activities for which the Catalyst DICOM Service is the association acceptor.

TABLE 2: ACCEPTABLE PRESENTATION CONTEXTS FOR CATALYST DICOM SERVICE APPLICATION ENTITY VERIFICATION

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		

Verification SOP Class	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
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2.3.1.3.1.2.1 SOP Specific DICOM Conformance Statement for the Verification SOP Class

The Catalyst DICOM Service Application Entity conforms to the definition of an SCP of the Verification SOP Class in accordance with the DICOM standard.

2.3.1.3.1.3 Presentation Context Acceptance Criterion

The Catalyst DICOM Service Application Entity will unconditionally accept a Presentation Context for the Verification association.

2.3.1.3.2 Real-World Activity: Image File Storage and Archival

2.3.1.3.2.1 Associated Real-World Activity

The Catalyst DICOM Service Application Entity will accept an association from a remote Application Entity to transfer images to the Catalyst DICOM Service Application Entity for image archival storage. This association supports the Real-World Activity Remote Request for Image Archival.

2.3.1.3.2.2 Accepted Presentation Context Table

The Catalyst DICOM Service Application Entity will accept multiple Presentation Contexts for the Remote Request for Image Archival activity as shown in Table 3. A single association may be used both for this activity and for any of the other activities for which the Catalyst DICOM Service is the association acceptor.

TABLE 3: ACCEPTABLE PRESENTATION CONTEXTS FOR CATALYST DICOM SERVICE APPLICATION ENTITY STORAGE

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
US Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	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		
		RLE Lossless	1.2.840.10008.1.2.5		
		JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50		
		JPEG Lossless Hierarch., First-order prediction	1.2.840.10008.1.2.4.70		
US Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

		Explicit VR, Little Endian Explicit VR, Big Endian RLE Lossless JPEG Baseline (Process 1) JPEG Lossless Hierarch., First-order prediction	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70		
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian RLE Lossless JPEG Baseline (Process 1) JPEG Lossless Hierarch., First-order prediction	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian RLE Lossless JPEG Baseline (Process 1) JPEG Lossless Hierarch., First-order prediction	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian RLE Lossless JPEG Baseline (Process 1) JPEG Lossless Hierarch., First-order prediction	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian RLE Lossless JPEG Baseline (Process 1) JPEG Lossless Hierarch., First-order prediction	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCP	None
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian RLE Lossless JPEG Baseline (Process 1) JPEG Lossless Hierarch.,	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.5 1.2.840.10008.1.2.4.50	SCP	None

		First-order prediction	1.2.840.10008.1.2.4.70		
--	--	------------------------	------------------------	--	--

2.3.1.3.2.2.1 SOP Specific DICOM Conformance Statement for all Storage SOP Classes

The Catalyst DICOM Service provides Level 2 (Full) conformance as an SCP of the Storage SOP Classes. All received attributes are stored and may be subsequently accessed, included private and other type 3 attributes included in the Standard Extended SOP Instances.

Stored SOP Instances may be accessed using the DICOM standard Query/Retrieve SOP Classes.

Users of Catalyst Client may manually edit and update patient values (demographics) created from the stored SOP Instances.

2.3.1.3.2.3 Presentation Context Acceptance Criterion

The Catalyst DICOM Service Application Entity will unconditionally accept a Presentation Context associated with Image File Storage and Archival.

2.3.1.3.2.4 Transfer Syntax Selection Policies

Within each Presentation Context, the Catalyst DICOM Service Application Entity will accept the first proposed transfer syntax that is supported.

2.3.1.3.3 Real-World Activity: Query/Retrieve

2.3.1.3.3.1 Associated Real-World Activity

The Catalyst DICOM Service Application Entity will accept an association from a remote Application Entity to query the Catalyst DICOM Service Application Entity for information about stored images and/or to retrieve images from the Catalyst DICOM Service Application Entity. This association supports the Real-World Activity Remote Query Retrieve Request.

2.3.1.3.3.2 Accepted Presentation Context Table

**TABLE 4: ACCEPTABLE PRESENTATION CONTEXTS FOR CATALYST DICOM SERVICE APPLICATION ENTITY
QUERY/RETRIEVE**

Presentation Context Table – Accepted
--

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR, Little Endian Explicit VR, Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

2.3.1.3.3.2.1 SOP Specific DICOM Conformance Statement for the Patient Root Query/Retrieve Information Model - FIND, Study Root Query/Retrieve Information Model – FIND, and Patient/Study Only Query/Retrieve Information Model – FIND SOP Classes

The Catalyst DICOM Service conforms to the definition of an SCP of the Query (C-FIND) Service in accordance with the DICOM standard.

The Catalyst DICOM Service does not support priority processing or relational queries.

Following are the status codes the Application may send back to the SCU Equipment after performing the requested **Query**:

TABLE 5: CATALYST DICOM SERVICE APPLICATION ENTITY QUERY RESPONSE CODES

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes	Related Fields Processed if received
Refused	A700	Unable to process	Database Access Error Cannot Understand Request Cannot Build Response	None
Success	0000	Matching is complete - No final identifier is supplied	No final identifier is supplied	None
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Current match is supplied and any optional keys were supported in the same manner as required keys	Identifier

2.3.1.3.3.2.2 SOP Specific DICOM Conformance Statement for the Patient Root Query/Retrieve Information Model - MOVE, Study Root Query/Retrieve Information Model – MOVE and Patient/Study Only Query/Retrieve Information Model - MOVE SOP Classes

The Catalyst DICOM Service conforms to the definition of an SCP of the Retrieve (C-MOVE) Service in accordance with the DICOM standard.

The Catalyst DICOM Service does not support priority processing or relational retrieves.

The Catalyst DICOM Service uses the Storage SOP Classes defined in Section 2.3.1.2 to support the C-STORE sub-operations of the retrieve SOP Classes.

Following are the status codes the Application may send back to the SCU Equipment after performing the requested **Retrieve**:

TABLE 6: CATALYST DICOM SERVICE APPLICATION ENTITY MOVE RESPONSE CODES

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes	Related Fields Processed if received
Refused	A700	Out of resources - Unable to calculate number of matches	System Error	None
Cancel	FE00	Sub-operations terminated due to a Cancel indication	Cancel Response	(0000,1020) (0000,1021) (0000,1022)

				(0000,1023)
Success	0000	Sub-operations Complete - No Failure.	No Failure	(0000,1021) (0000,1022) (0000,1023)
Pending	FF00	Sub-operations are continuing -	More sub-operations to be returned	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

2.3.1.3.4 Real-World Activity: Modality Worklist

2.3.1.3.4.1 Associated Real-World Activity

The Catalyst DICOM Service Application Entity will accept an association from a remote Application Entity to query the Catalyst DICOM Service Application Entity for information about stored images and/or to retrieve images from the Catalyst DICOM Service Application Entity. This association supports the Real-World Activity Remote Modality Worklist Request.

2.3.1.3.4.2 Accepted Presentation Context Table

**TABLE 7: ACCEPTABLE PRESENTATION CONTEXTS FOR CATALYST DICOM SERVICE APPLICATION ENTITY
QUERY/RETRIEVE**

Presentation Context Table – Accepted					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Worklist Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR, Little Endian	1.2.840.10008.1.2.1		
		Explicit VR, Big Endian	1.2.840.10008.1.2.2		

2.3.1.3.4.2.1 SOP Specific DICOM Conformance Statement for the Modality Worklist Query/Retrieve Information Model - FIND SOP Classes

The Catalyst DICOM Service conforms to the definition of an SCP of the Modality Worklist Service in accordance with the DICOM standard.

The Catalyst DICOM Service does not support priority processing or relational queries.

Following are the status codes the Application may send back to the SCU Equipment after a Modality Worklist Request:

TABLE 8: CATALYST DICOM SERVICE APPLICATION ENTITY QUERY RESPONSE CODES

Service Status	Status Codes	Further Meaning	Application Behavior When receiving Status Codes	Related Fields Processed if received
Refused	A700	Unable to process	Database Access Error Cannot Understand Request Cannot Build Response	None
Success	0000	Matching is complete - No final identifier is supplied	No final identifier is supplied	None
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Current match is supplied and any optional keys were supported in the same manner as required keys	Identifier

2.3.1.3.4.3 Presentation Context Acceptance Criterion

There are no special criteria for accepting Query/Retrieve Presentation Contexts.

2.3.1.3.4.4 Transfer Syntax Selection Policies

Within each Presentation Context, the Catalyst DICOM Service Application Entity will accept the first proposed transfer syntax that is supported.

2.4 COMMUNICATION PROFILES

2.4.1 Supported Communication Stacks (PS 3.8, PS 3.9)

DICOM Upper Layer (PS 3.8) is supported using TCP/IP.

2.4.2 OSI Stack

OSI stack not supported

2.4.3 TCP/IP Stack

The TCP/IP stack is inherited from the Windows NT Server Operating System.

2.4.3.1 API

Not applicable to this product.

2.4.3.2 Physical Media Support

DICOM is indifferent to the Physical medium over which TCP/IP executes (e.g. Ethernet V2.0, IEEE 802.3, ATM, FDDI)

Note: For more information about the Physical Media available on Catalyst DICOM Service, please refer to the Product Data Sheet.

2.4.4 Point-to-Point Stack

A 50-pin ACR-NEMA connection is not applicable to this product.

2.5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

2.5.1 Standard Extended /Specialized/Private SOPs

2.5.1.1 Standard Extended Query SOP Class

The Catalyst DICOM Service Application Entity provides Standard Extended Conformance to the supported DICOM Query SOP Classes as an SCP. The extension occurs as a result of supporting private query attributes (see Section 3.5).

2.6 CONFIGURATION

2.6.1 AE Title/Presentation Address Mapping

The Catalyst DICOM Service Application Entity resolves addresses of other applications and entities using a configurable look-up table. DICOM Maintenance, a part of System Management of Catalyst Client, maintains this table.

2.6.2 Configurable Parameters

The following fields are configurable for this AE (local):

- Local AE Title
- Local Listening Port Number

The following fields are configurable for every remote DICOM AE:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number
- Whether they support Query/Retrieve

- Default hospital location to store images

2.7 SUPPORT OF EXTENDED CHARACTER SETS

The Catalyst DICOM Service will support only the ISO_IR 100 (ISO 8859-1:1987 Latin alphabet N 1. supplementary set) as extended character sets. Any incoming SOP instance that is encoded using another extended character set will be stored in the database but data may be unreadable because of the foreign character sets.

3. PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL DEFINITION

3.1 INTRODUCTION

This section specifies the use of the DICOM Patient Root Query/Retrieve Model used to organize data and against which a Query/Retrieve will be performed. The contents of this section are:

3.2 - Information Model Description

3.3 - Information Model Entity-Relationship Model

3.4 - Information Model Keys

3.2 PATIENT ROOT INFORMATION MODEL DESCRIPTION

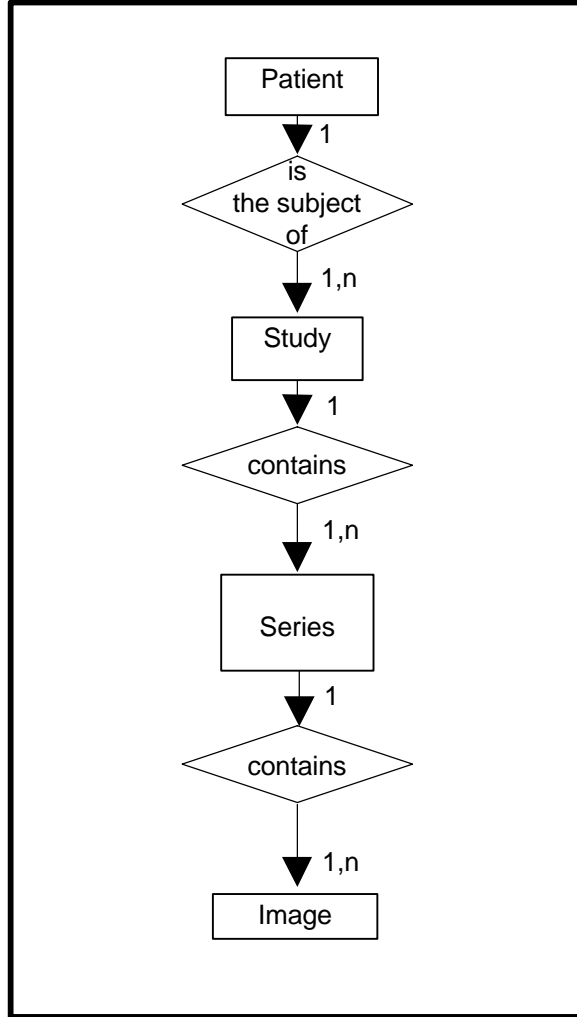
3.3 PATIENT ROOT INFORMATION MODEL ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the Patient Root Information Model schema is shown in Illustration 3.3-1. In this figure, the following diagrammatic convention is established to represent the information organization :

- each entity is represented by a rectangular box
- each relationship is represented by a diamond shaped box.
- the fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

The relationships are fully defined with the maximum number of possible entities in the relationship shown. In other words, the relationship between Series and Image can have up to n Images per Series.

ILLUSTRATION 3.3-1
PATIENT ROOT QUERY/RETRIEVE INFORMATION MODEL E/R DIAGRAM



3.3.1 ENTITY DESCRIPTIONS

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Patient Root Query/Retrieve Information Model.

3.3.2 Catalyst DICOM Service Mapping of DICOM entities

TABLE 3.3-1
MAPPING OF DICOM ENTITIES TO CATALYST DICOM SERVICE ENTITIES

DICOM	Catalyst DICOM Service Entity
Patient	Patient
Study	Exam or Case
Series	Series
Image	Run or Loop

3.4 INFORMATION MODEL KEYS

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Patient Root Query/Retrieve Information Model.

The following Level descriptions are included to specify what data elements are supported and what type of matching can be applied. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard PS 3.4 (Service Class Specifications).

3.4.1 Supported Matching

Following are the types of matching that are supported by the implementation:

- Single Value Matching
- Universal Matching
- Wild Card Matching
- Range of Date, Range of Time Matching

3.4.2 Patient Level

This section defines the keys at the Patient Level of the Patient Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 3.4-1
PATIENT LEVEL ATTRIBUTES FOR THE PATIENT ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Note
Patient's Name	(0010,0010)	R	Single Value Matching, Universal Matching, Wild Card Matching
Patient ID	(0010,0020)	U	Single Value Matching, Universal Matching, Wild Card Matching
Patient's Birth Date	(0010,0030)	O	Universal Matching
Patient's Sex	(0010,0040)	O	Universal Matching
Number of Patient Related Studies	(0020,1200)	O	Universal Matching
Number of Patient Related Series	(0020,1202)	O	Universal Matching
Number of Patient Related Images	(0020,1204)	O	Universal Matching
Current Patient Location	(0038,0300)	O	Single Value Matching, Universal Matching, Wild Card Matching

TABLE 3.4-2
Q/R PATIENT LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = PATIENT
Retrieve AE Title	(0008,0054)	-	None

3.4.3 Study Level

This section defines the keys at the Study Level of the Patient Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 3.4-3
STUDY LEVEL ATTRIBUTES FOR THE PATIENT ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
Study Date	(0008,0020)	R	Single Value Matching, Universal Matching, Range of Date Matching
Study Time	(0008,0030)	R	Single Value Matching, Universal Matching, Range of Time Matching
Accession Number	(0008,0050)	R	Single Value Matching, Universal Matching, Wild Card Matching
Modalities In Study	(0008,0061)	O	Single Value Matching, Universal Matching
Referring Physician's Name	(0008,0090)	O	Single Value Matching, Universal Matching, Wild Card Matching
Study Description	(0008,1030)	O	Universal Matching
Performing Physician	(0008,1050)	O	Single Value Matching, Universal Matching, Wild Card Matching
Study Instance UID	(0020,000D)	U	Single Value Matching, Universal Matching, Wild Card Matching
Study ID	(0020,0010)	R	Single Value Matching, Universal Matching, Wild Card Matching
Number of Study Related Series	(0020,1206)	O	Universal Matching
Number of Study Related Images	(0020,1208)	O	Universal Matching

TABLE 3.4-4
Q/R STUDY LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = STUDY
Retrieve AE Title	(0008,0054)	-	None

3.4.4 Series Level

This section defines the keys at the Series Level of the Patient Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 3.4-5
SERIES LEVEL ATTRIBUTES FOR THE PATIENT ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	R	Single Value Matching, Universal Matching
Series Instance UID	(0020,000E)	U	Single Value Matching, Universal Matching, Wild Card Matching
Series Number	(0020,0011)	R	Single Value Matching, Universal Matching, Wild Card Matching
Number of Series Related Images	(0020,1209)	O	Universal Matching

TABLE 3.4-6
Q/R SERIES LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = SERIES
Retrieve AE Title	(0008,0054)	-	None

3.4.5 Image Level

This section defines the keys at the Image Level of the Patient Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 3.4-7
IMAGE LEVEL ATTRIBUTES FOR THE PATIENT ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	O	Single Value Matching, Universal Matching, Wild Card Matching
SOP Instance UID	(0008,0018)	U	Single Value Matching, Universal Matching, Wild Card Matching
Image Number	(0020,0013)	R	Single Value Matching, Universal Matching, Wild Card Matching
Number of Frames	(0028,0008)	O	Universal Matching
Rows	(0028,0010)	O	Universal Matching
Columns	(0028,0011)	O	Universal Matching

TABLE 3.4-8
Q/R IMAGE LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = IMAGE
Retrieve AE Title	(0008,0054)	-	None

4. STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL DEFINITION

4.1 INTRODUCTION

This section specifies the use of the DICOM Study Root Query/Retrieve Model used to organize data and against which a Query/Retrieve will be performed. The contents of this section are:

4.2 - Information Model Description

4.3 - Information Model Entity-Relationship Model

4.4 - Information Model Keys

4.2 STUDY ROOT INFORMATION MODEL DESCRIPTION

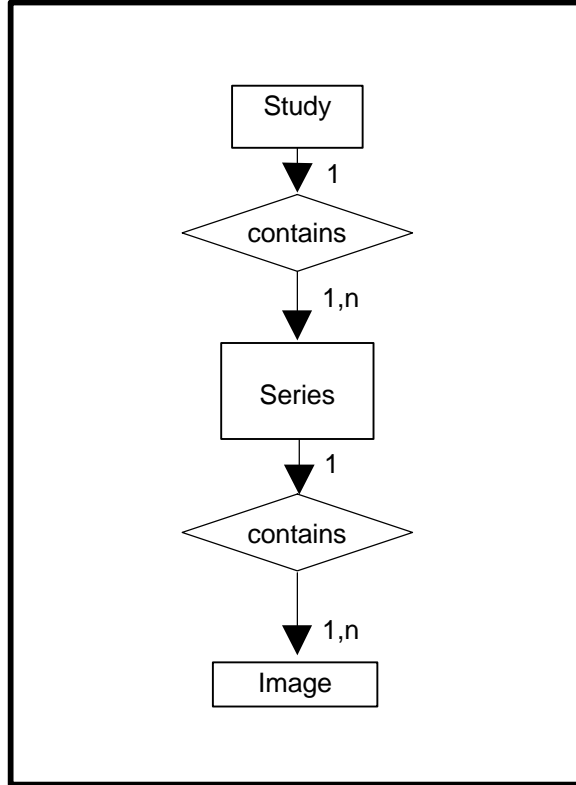
4.3 STUDY ROOT INFORMATION MODEL ENTITY- RELATIONSHIP MODEL

The Entity-Relationship diagram for the Study Root Information Model schema is shown in Illustration 4.3-1. In this figure, the following diagrammatic convention is established to represent the information organization :

- each entity is represented by a rectangular box
- each relationship is represented by a diamond shaped box.
- the fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

The relationships are fully defined with the maximum number of possible entities in the relationship shown. In other words, the relationship between Series and Image can have up to n Images per Series.

ILLUSTRATION 4.3-1
STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL E/R DIAGRAM



4.3.1 Entity Descriptions

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Study Root Query/Retrieve Information Model.

4.4 INFORMATION MODEL KEYS

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Study Root Query/Retrieve Information Model.

The following Level descriptions are included to specify what data elements are supported and what type of matching can be applied. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard PS 3.4 (Service Class Specifications).

4.4.1 Supported Matching

Following are the types of matching that are supported by the implementation:

- Single Value matching

- Universal Matching
- Wild Card Matching
- Range of date, Range of Time

4.4.2 Study Level

This section defines the keys at the Study Level of the Study Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 4.4-9
STUDY LEVEL ATTRIBUTES FOR THE STUDY ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
Study Date	(0008,0020)	R	Single Value Matching, Universal Matching, Range of Date Matching
Study Time	(0008,0030)	R	Single Value Matching, Universal Matching, Range of Time Matching
Accession Number	(0008,0050)	R	Single Value Matching, Universal Matching, Wild Card Matching
Modalities In Study	(0008,0061)	O	Single Value Matching, Universal Matching
Referring Physician's Name	(0008,0090)	O	Single Value Matching, Universal Matching, Wild Card Matching
Study Description	(0008,1030)	O	Universal Matching
Patient's Name	(0010,0010)	R	Single Value Matching, Universal Matching, Wild Card Matching
Patient ID	(0010,0020)	R	Single Value Matching, Universal Matching, Wild Card Matching
Study Instance UID	(0020,000D)	U	Single Value Matching, Universal Matching, Wild Card Matching
Study ID	(0020,0010)	R	Single Value Matching, Universal Matching, Wild Card Matching
Number of Study Related Series	(0020,1206)	O	Universal Matching
Number of Study Related Images	(0020,1208)	O	Universal Matching

TABLE 4.4-10
Q/R STUDY LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = STUDY
Retrieve AE Title	(0008,0054)	-	None

4.4.3 Series Level

This section defines the keys at the Series Level of the Study Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 4.4-11
SERIES LEVEL ATTRIBUTES FOR THE STUDY ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	R	Single Value Matching, Universal Matching
Performing Physician's Name	(0008,1050)	O	Single Value Matching, Universal Matching, Wild Card Matching
Series Number	(0020,0011)	R	Single Value Matching, Universal Matching, Wild Card Matching
Series Instance UID	(0020,000E)	U	Single Value Matching, Universal Matching, Wild Card Matching
Number of Series Related Images	(0020,1209)	O	Universal Matching

TABLE 4.4-12
Q/R SERIES LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = SERIES
Retrieve AE Title	(0008,0054)	-	None

4.4.4 Image Level

This section defines the keys at the Image Level of the Study Root Query/Retrieve Information Model that are supported by this implementation.

TABLE 4.4-13
IMAGE LEVEL ATTRIBUTES FOR THE STUDY ROOT
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	O	Single Value Matching, Universal Matching, Wild Card Matching
SOP Instance UID	(0008,0018)	U	Single Value Matching, Universal Matching, Wild Card Matching

Image Number	(0020,0013)	R	Single Value Matching, Universal Matching, Wild Card Matching
Number of Frames	(0028,0008)	O	Universal Matching
Rows	(0028,0010)	O	Universal Matching
Columns	(0028,0011)	O	Universal Matching

TABLE 4.4-14
Q/R IMAGE LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = IMAGE
Retrieve AE Title	(0008,0054)	-	None

5. PATIENT/STUDY ONLY QUERY/RETRIEVE INFORMATION MODEL DEFINITION

5.1 INTRODUCTION

This section specifies the use of the DICOM Patient/Study only Query/Retrieve Model used to organize data and against which a Query/Retrieve will be performed. The contents of this section are:

5.2 - Information Model Description

5.3 - Information Model Entity-Relationship Model

5.4 - Information Model Keys

5.2 PATIENT/STUDY ONLY INFORMATION MODEL DESCRIPTION

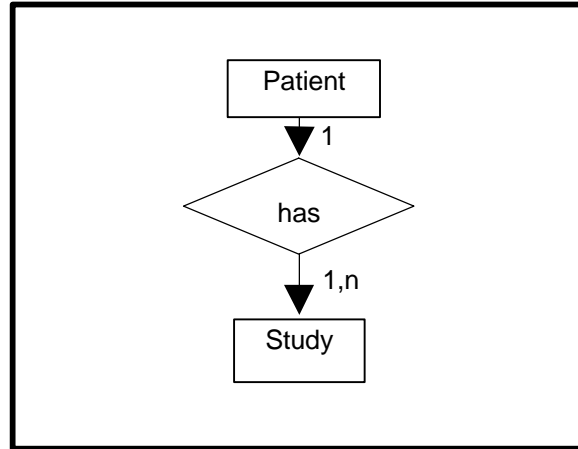
5.3 PATIENT/STUDY ONLY INFORMATION MODEL ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the Patient/Study only Information Model schema is shown in Illustration 5.3-1. In this figure, the following diagrammatic convention is established to represent the information organization :

- each entity is represented by a rectangular box
- each relationship is represented by a diamond shaped box.
- the fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

The relationships are fully defined with the maximum number of possible entities in the relationship shown. In other words, the relationship between Patient and Study can have up to n Studies per Patient.

ILLUSTRATION 5.3-1
PATIENT/STUDY ONLY QUERY/RETRIEVE INFORMATION MODEL E/R DIAGRAM



5.3.1 Entity Description

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Patient/Study only Query/Retrieve Information Model.

5.4 INFORMATION MODEL KEYS

Please refer to DICOM Standard PS 3.4 (Service Class Specifications) for a description of each of the levels contained within the Patient/Study only Query/Retrieve Information Model.

The following Level descriptions are included to specify what data elements are supported and what type of matching can be applied. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard PS 3.4 (Service Class Specifications).

5.4.1 Supported Matching

Following are the types of matching that are supported by the implementation :

- Single Value matching
- Universal Matching
- Wild Card Matching
- Range of date, Range of Time

1.1.2 Patient Level

This section defines the keys at the Patient Level of the Patient/Study only Query/Retrieve Information Model that are supported by this implementation.

TABLE 5.4-1
PATIENT LEVEL ATTRIBUTES FOR THE PATIENT/STUDY ONLY
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Note
Patient's Name	(0010,0010)	R	Single Value Matching, Universal Matching, Wild Card Matching
Patient ID	(0010,0020)	U	Single Value Matching, Universal Matching, Wild Card Matching
Patient's Birth Date	(0010,0030)	O	Universal Matching
Patient's Sex	(0010,0040)	O	Universal Matching
Number of Patient Related Studies	(0020,1200)	O	Universal Matching
Number of Patient Related Series	(0020,1202)	O	Universal Matching
Number of Patient Related Images	(0020,1204)	O	Universal Matching
Current Patient Location	(0038,0300)	O	Single Value Matching, Universal Matching, Wild Card Matching

TABLE 5.4-2
Q/R PATIENT LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = PATIENT
Retrieve AE Title	(0008,0054)	-	None

5.4.3 Study Level

This section defines the keys at the Study Level of the Patient/Study only Query/Retrieve Information Model that are supported by this implementation.

TABLE 5.4-3
STUDY LEVEL ATTRIBUTES FOR THE PATIENT/STUDY ONLY
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type	Attribute Description
Study Date	(0008,0020)	R	Single Value Matching, Universal Matching, Range of Date Matching
Study Time	(0008,0030)	R	Single Value Matching, Universal Matching, Range of Time Matching
Accession Number	(0008,0050)	R	Single Value Matching, Universal Matching, Wild Card Matching
Modalities In Study	(0008,0061)	O	Single Value Matching, Universal Matching

Referring Physician's Name	(0008,0090)	O	Single Value Matching, Universal Matching, Wild Card Matching
Study Description	(0008,1030)	O	Universal Matching
Performing Physician	(0008,1050)	O	Single Value Matching, Universal Matching, Wild Card Matching
Study Instance UID	(0020,000D)	U	Single Value Matching, Universal Matching, Wild Card Matching
Study ID	(0020,0010)	R	Single Value Matching, Universal Matching, Wild Card Matching
Number of Study Related Series	(0020,1206)	O	Universal Matching
Number of Study Related Images	(0020,1208)	O	Universal Matching

TABLE 5.4-4
Q/R STUDY LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = STUDY
Retrieve AE Title	(0008,0054)	-	None

6. MODALITY WORKLIST INFORMATION MODEL DEFINITION

6.1 INTRODUCTION

This section specifies the use of the DICOM Modality Worklist Information Model used to organize data and against which a Modality Worklist Query will be performed. The contents of this section are:

- 6.2 - Information Model Description
- 6.3 - Information Model Entity-Relationship Model
- 6.4 - Information Model Module Table
- 6.5 - Information Model Keys

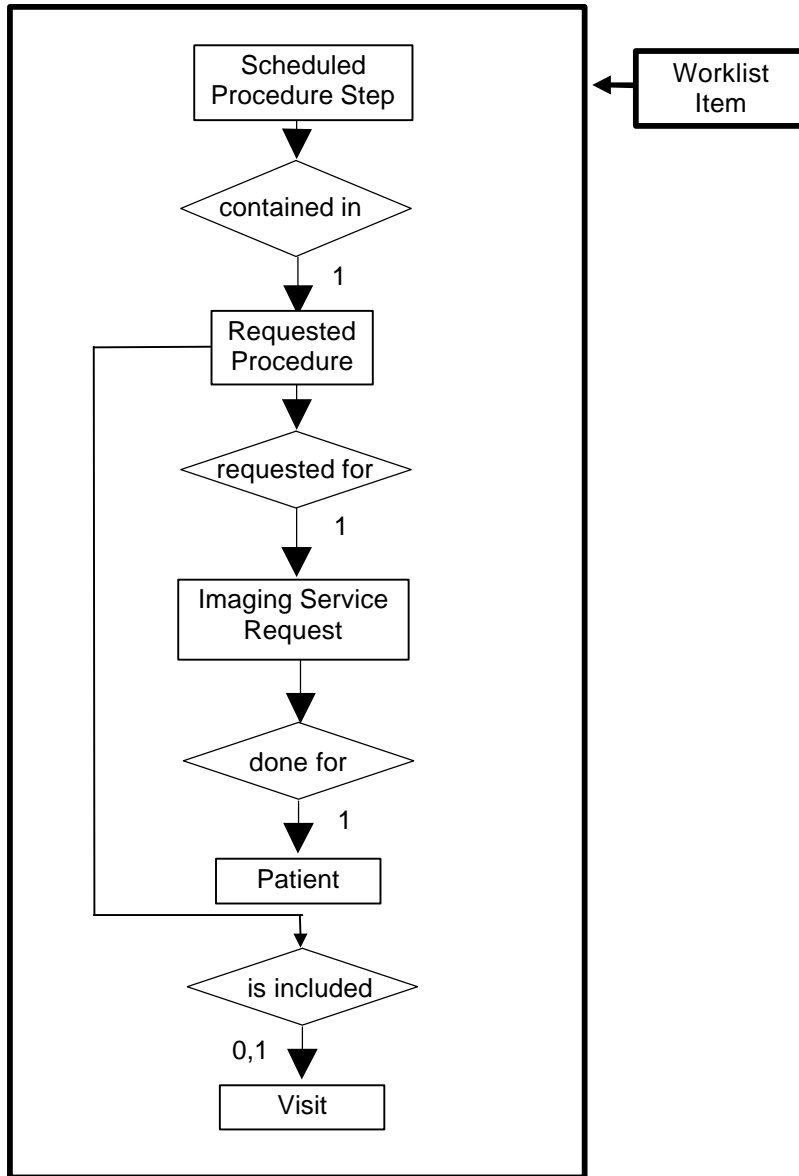
6.2 MODALITY WORKLIST INFORMATION MODEL DESCRIPTION

6.3 MODALITY WORKLIST INFORMATION MODEL ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the Modality Worklist Information Model schema is shown in Illustration 6.3-2. It represents the information that composes a Worklist Item. In this figure, the following diagrammatic convention is established to represent the information organization :

- each entity is represented by a rectangular box
- each relationship is represented by a diamond shaped box.
- the fact that a relationship exists between two entities is depicted by lines connecting the corresponding entity boxes to the relationship boxes.

ILLUSTRATION 6.3-2
MODALITY WORKLIST INFORMATION MODEL E/R DIAGRAM



6.3.1 ENTITY DESCRIPTIONS

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) and PS 3.4 (Service Class Specifications) for a description of each of the Entities contained within the Modality Worklist Information Model.

6.3.2 Catalyst DICOM Service Mapping of DICOM entities

TABLE 6.3-1
MAPPING OF DICOM ENTITIES TO CATALYST DICOM SERVICE ENTITIES

DICOM	Catalyst DICOM Service Entity
Scheduled Procedure Step	Scheduling
Requested Procedure	Modality Procedure
Imaging Service Request	Modality Procedure
Visit	Admission
Patient	Patient

6.4 INFORMATION MODEL MODULE TABLE

Within an entity of the DICOM v3.0 Modality Worklist Information Model, attributes are grouped into related set of attributes. A set of related attributes is termed a module. A module facilitates the understanding of the semantics concerning the attributes and how the attributes are related with each other. A module grouping does not infer any encoding of information into datasets.

Table 6.4-1 identifies the defined modules within the entities which comprise the DICOM v3.0 Modality Worklist Information Model. Modules are identified by Module Name.

See DICOM v3.0 PS 3.3 and PS 3.4 for a complete definition of the entities, modules, and attributes.

TABLE 6.4-1
MODALITY WORKLIST INFORMATION MODEL MODULES

Entity Name	Module Name	Reference
Scheduled Procedure Step	SOP Common	6.5.1.1
	Scheduled Procedure Step	6.5.1.2
Requested Procedure	Requested Procedure	6.5.2.1
Imaging Service Request	Imaging Service Request	6.5.3.1
Visit	Visit Identification	6.5.4.1
	Visit Status	6.5.4.2
Patient	Patient Identification	6.5.5.1
	Patient Demographic	6.5.5.2

6.5 INFORMATION MODEL KEYS

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) and PS 3.4 (Service Class Specifications) for a description of each of the Entities contained within the Modality Worklist Information Model.

The following Module descriptions are included to specify what data elements are supported and what type of matching can be applied. It should be noted that they are the same ones as defined in the DICOM v3.0 Standard PS 3.4 (Service Class Specifications).

6.5.1 Scheduled Procedure Step Entity

6.5.1.1 SOP Common Module

TABLE 6.5-1
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Specific Character Set	(0008,0005)	O	1C	

6.5.1.2 Scheduled Procedure Step Module

TABLE 6.5-2
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Scheduled Procedure Step Sequence	(0040,0100)	R	1	
>Scheduled Station AE Title	(0040,0001)	R	1	Single Value Matching, Universal Matching, Wild Card Matching
>Scheduled Procedure Step Start Date	(0040,0002)	R	1	Single Value Matching, Universal Matching, Range of Date Matching
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	Single Value Matching, Universal Matching, Range of Time Matching
>Modality	(0008,0060)	R	1	Single Value Matching, Universal Matching
>Scheduled Performing Physician's Name	(0040,0006)	O	2	Universal Matching
>Scheduled Procedure Step End Date	(0008,0004)	O	1	Single Value Matching, Universal Matching, Range of Date Matching
>Scheduled Procedure Step End Time	(0008,0005)	O	1	Single Value Matching, Universal Matching, Range of Time Matching

>Scheduled Station Name	(0040,0010)	O	2	Single Value Matching, Universal Matching, Wild Card Matching
>Scheduled Procedure Step Location	(0040,0011)	O	2	Single Value Matching, Universal Matching, Wild Card Matching
>Scheduled Procedure Step Status	(0040,0020)	O	1	Single Value Matching, Universal Matching, Wild Card Matching

6.5.2 Requested Procedure Entity

6.5.2.1 Requested Procedure Module

TABLE 6.5-3
REQUESTED PROCEDURE MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Study Instance UID	(0020,000D)	O	1	Single Value Matching, Universal Matching, Wild Card Matching
Referenced Study Sequence	(0008,1110)	O	2	
>Referenced SOP Class UID	(0008,1150)	O	1C	Single Value Matching, Universal Matching, Wild Card Matching
>Referenced SOP Instance UID	(0008,1155)	O	1C	Single Value Matching, Universal Matching, Wild Card Matching

6.5.3 Imaging Service Request Entity

6.5.3.1 Imaging Service Request Module

TABLE 6.5-4
IMAGING SERVICE REQUEST MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Accession Number	(0008,0050)	O	2	Universal Matching
Referring Physician's Name	(0008,0090)	O	2	Universal Matching

6.5.4 Visit Entity

1.1.1.1 Visit Identification

TABLE 6.5-5
VISIT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Admission ID	(0038,0010)	O	2	Single Value Matching, Universal Matching, Wild Card Matching

6.5.4.2 Visit Status

TABLE 6.5-6
VISIT STATUS MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Current Patient Location	(0038,0300)	O	2	

6.5.5 Patient Entity

6.5.5.1 Patient Identification

TABLE 6.5-7
PATIENT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Patient's Name	(0010,0010)	R	1	Single Value Matching, Universal Matching, Wild Card Matching
Patient ID	(0010,0020)	R	1	Single Value Matching, Universal Matching, Wild Card Matching

6.5.5.2 Patient Demographic

TABLE 6.5-8
PATIENT DEMOGRAPHIC MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Note
Patients Birth Date	(0010,0030)	O	2	Universal Matching
Patient's Sex	(0010,0040)	O	2	Universal Matching