

# Technical Publications

Direction 5177444-100  
*Revision 02*

## LOGIQ P3 version 5.x.x CONFORMANCE STATEMENT for DICOM

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## REVISION HISTORY

<b>Revision</b>	<b>Date</b>	<b>Description</b>
0	July 11, 2006	Release for LOGIQ P3, R4.x.x version
1	July 31, 2007	Release for LOGIQ P3 BT07, R5.x.x version

## CONFORMANCE STATEMENT OVERVIEW

The LOGIQ P3 is a self-contained networked computer system used for acquiring ultrasound diagnostic medical images. The system implements the necessary DICOM services to download work list from an information system, save acquired US images to a network storage device or media, print to a networked hardcopy device, query and move US images from a networked storage and inform the information system about the work actually done. The system conforms to the DICOM standard to allow the sharing of medical information with other digital imaging systems.

Table A.1 provides an overview of the network services supported by LOGIQ P3.

**Table A.1 Network Services**

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
<b>Transfer</b>		
Verification	Yes	Yes
US Image Storage	Yes	Yes
US Multi-frame Storage	Yes	Yes
US Image Storage (retired)	Yes	Yes
US Multi-frame Storage (retired)	Yes	Yes
Secondary Capture Image Storage	Yes	Yes
Comprehensive SR Storage	Yes	No
<b>Query/Retrieve</b>		
Study Root Q/R – FIND	Yes	No
Study Root Q/R – MOVE	Yes	No
<b>Print Management</b>		
Basic Grayscale Print Management	Yes	No
Basic Color Print Management	Yes	No
<b>Workflow Management</b>		
Modality Worklist	Yes	No
Modality Performed Procedure	Yes	No
Storage Commitment Push Model	Yes	No

Table A.2 provides an overview of the Media Storage Application Profile supported by LOGIQ P3.

**Table A.2 Media Services**

Media Storage Application Profile	Write Files (FSC or FSU)	Read Files (FSR)
<b>Compact Disk - R</b>		
General Purpose CD-R	Yes	Yes
<b>DVD</b>		
General Purpose DVD	Yes	Yes



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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 (Media Storage Conformance Statement)**, which specifies the GEMS equipment compliance to the DICOM requirements for the implementation of Media Storage features.

**Section 4 (Ultrasound Information Object Implementation)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of an Ultrasound Medicine Information Object.

**Section 5 (Ultrasound Multi-Frame Information Object Implementation)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of an Ultrasound Multi-Frame Information.

**Section 6 (SC Object Implementation)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of a Secondary Capture Information Object.

**Section 7 (SR Object Implementation)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of a Comprehensive Structured Reporting Information Object.

**Section 8 (Basic Directory Information Object Implementation)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of a Basic Directory Information Object.

**Section 9 (Modality Worklist Information Model)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Modality Worklist service.

**Section 10 (Modality Performed Procedure Step SOP Class Definition)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of Modality Performed Procedure Step Service.

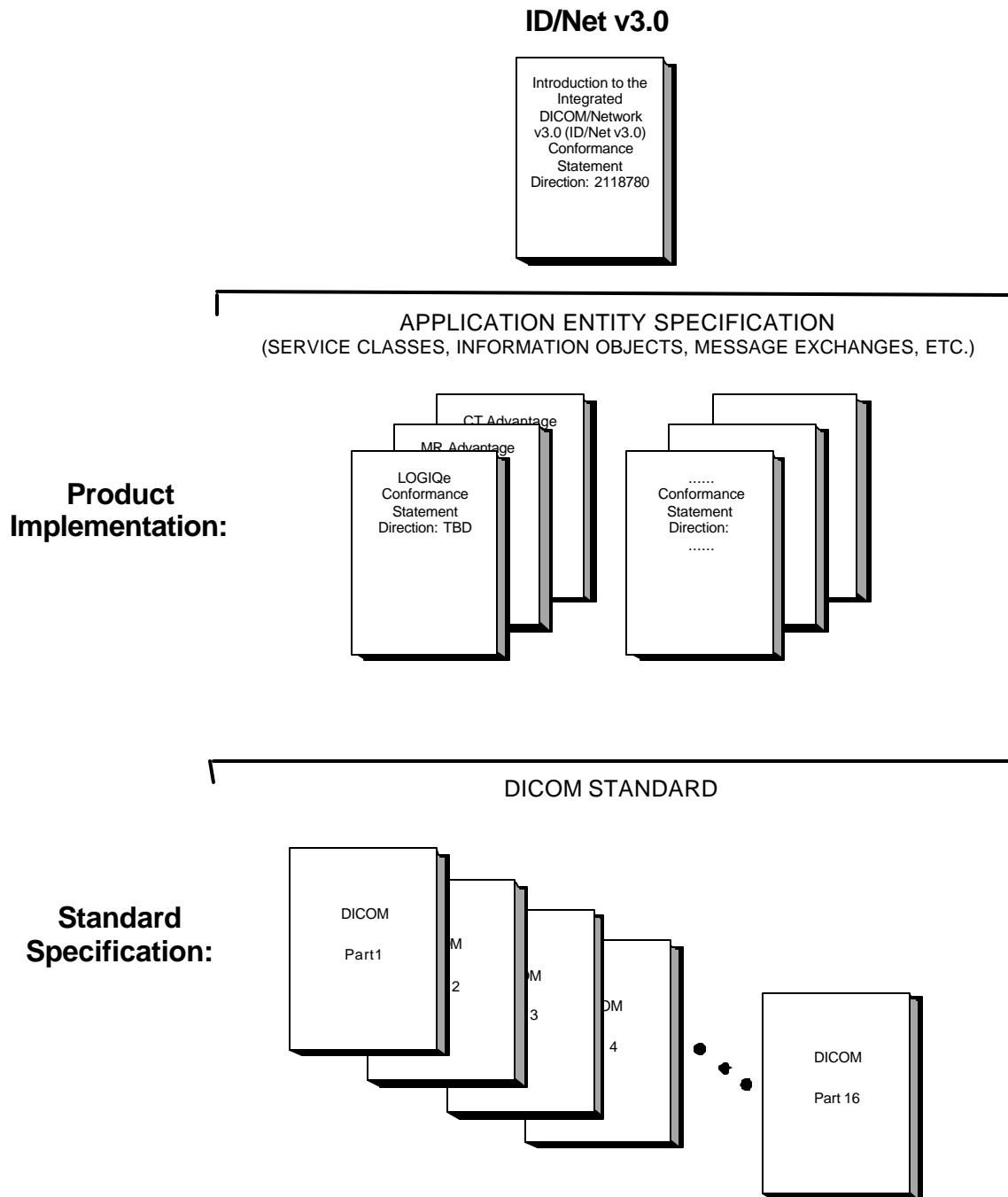
**Section 11 (Storage Commitment Push Model SOP Class Definition)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of the Storage Commitment Push Model Service.

**Section 12 (Basic Print Meta SOP Class Information Object Implementation)**, which specifies the GEMS equipment compliance to DICOM requirements for the implementation of Basic Print Meta SOP Classes (Gray and Color).

**Section 13 (Study Root Query/Retrieve Information Model)**, which specifies the GEMS equipment compliance to DICOM requirements for the Study Root Query/Retrieve Information Model.

### 1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE

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



This document specifies the DICOM implementation. It is entitled:

*LOGIQ P3 version 5.x.x  
Conformance Statement for DICOM  
Direction 5177444-100*

This DICOM Conformance Statement documents the DICOM 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 Part 8 standard.

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

For more information regarding DICOM, copies of the Standard may be obtained on the Internet at <http://medical.nema.org>. Comments on the Standard may be addressed to:

DICOM Secretariat  
NEMA  
1300 N. 17<sup>th</sup> Street, Suite 1847  
Rosslyn, VA 22209  
USA  
Phone: +1.703.841.3200

### 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 Standards and with the terminology and concepts, which are used in those Standards.

If readers are unfamiliar with DICOM terminology they should first refer to the document listed below, then read the DICOM 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 Conformance Statement and is necessary to ensure proper processing and interpretation of GEMS medical data exchanged using DICOM. 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 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 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), 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 Standard. DICOM will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEMS protocol is based on DICOM as specified in each DICOM Conformance Statement. Evolution of the Standard may require changes to devices, which have implemented DICOM. **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.
- **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 for LOGIQ P3 version 5.x.x 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.

LOGIQ P3 is an Ultrasound scanner running on a commercial computer. It allows for the following DICOM functionality:

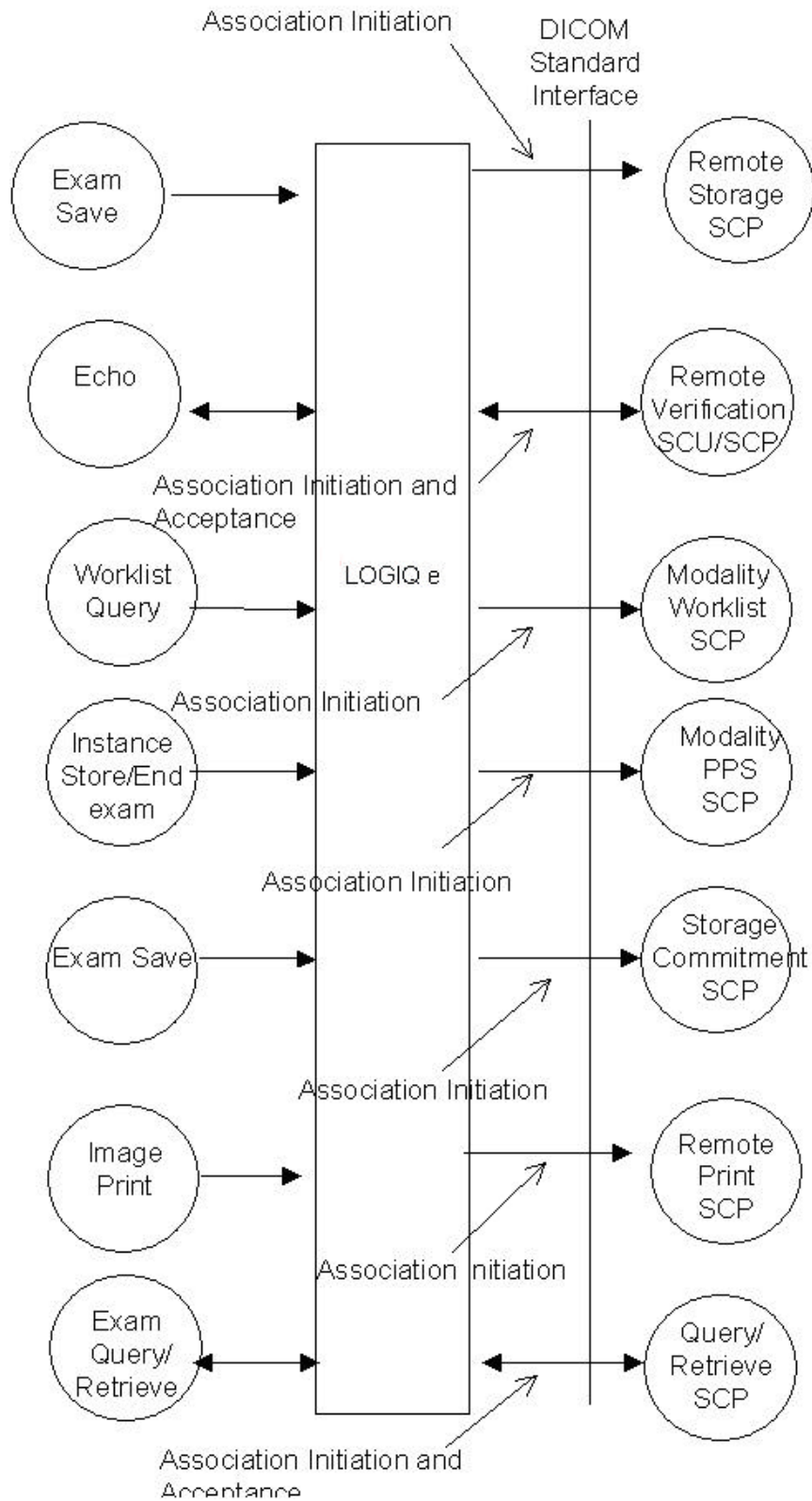
- Sending and receiving Echo messages to and from DICOM Verification SCP and client.
- Exporting DICOM images and reports to a DICOM SCP or saving the DICOM images and results to DICOM media format.
- Browsing and viewing DICOM images on DICOM media format.
- Querying and retrieving DICOM Modality Worklist from a Worklist SCP.
- Sending start and end of examination to a DICOM Modality Performed Procedure Step SCP.
- Sending storage commitment requests (and receiving replies) to a DICOM Storage Commitment SCP.
- Printing images to a DICOM Printer.
- Querying for examinations from a DICOM Query/Retrieve SCP.

### 2.2 IMPLEMENTATION MODEL

#### 2.2.1 Application Data Flow Diagram

The Basic and Specific Application models for this device are shown in the following illustration:







SOP Class Name	SOP Class UID
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Verification SOP Class	1.2.840.10008.1.1
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
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
Comprehensive Structured Report Storage	1.2.840.10008.5.1.4.1.1.88.33

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

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

**2.3.1.1 Association Establishment Policies**

**2.3.1.1.1 General**

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

<b>Application Context Name</b>	<b>1.2.840.10008.3.1.1.1</b>
---------------------------------	------------------------------

The Maximum Length PDU negotiation is included in all association establishment requests. The maximum length PDU for an association initiated by LOGIQ P3 is:

<b>Maximum Length PDU</b>	<b>32768</b>
---------------------------	--------------

The SOP Class Extended Negotiation is not supported.  
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 LOGIQ P3 AE will initiate multiple DICOM associations.

**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 Implementation is:

<b>LOGIQ P3 Implementation UID</b>	<b>1.2.840.113619.6.115</b>
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The Implementation Version Name for this DICOM Implementation is:

<b>LOGIQ P3 Implementation Version Name</b>	<b>LOGIQ P3_BT07</b>
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Note: The Implementation Version Name may change in the future without modification of this document.

**2.3.1.2 Association Initiation Policy**

The LOGIQ P3 AE attempts to establish a new association with a remote device due to six Real-World Activities:

- Exam save initiated by the operator for images and reports and sending request for Storage Commitment.
- Verification, which verifies application level communication between peer DICOM AE's for service purposes.
- Worklist initiated by the operator for receiving worklist information.
- Image Store/End Exam sending messages to Modality Performed Procedure Step.
- Print initiated by the operator for a specific image or group of images.

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- Exam Query/Retrieve initiated by the operator for receiving examination information and selecting examination to retrieve.

### 2.3.1.2.1 Real-World Activity A ('Exam save' Operation)

#### 2.3.1.2.1.1 Associated Real-World Activity

Upon a request by the operator (manual or automatic), images will be sent to a DICOM Storage SCP.

#### 2.3.1.2.1.2 Proposed Presentation Context Tables

The Proposed Presentation Context Table depends on compression according to the following table:

Presentation Context Table – Proposed					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
<b>Presentation Context Table: Compression set to None</b>					
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
<b>Presentation Context Table: Compression set to RLE</b>					
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Run Length Encoding, RLE Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.5 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Run Length Encoding, RLE Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.5 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Run Length Encoding, RLE Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.5 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	Run Length Encoding, RLE Explicit VR Little	1.2.840.10008.1.2.5 1.2.840.10008.1.2.1	SCU	None

		Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.2 1.2.840.10008.1.2		
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	Run Length Encoding, RLE Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.5  1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
<b>Presentation Context Table: Compression set to JPEG</b>					
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14)	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14)	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCU	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14)	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCU	None
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14)	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCU	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14)	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70	SCU	None
<b>Presentation Context Table for Structured Reports</b>					
Comprehensive Structured Report	1.2.840.10008.5.1.4.1.1.88.33	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1  1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

**2.3.1.2.1.2.1 SOP Specific DICOM Conformance Statement for all Storage SOP Classes**

This operation also sends a Storage Commitment Request, with the following proposed presentation context. The result from the SCP is expected on another association for the Storage Commitment result.

<b>Presentation Context Table Proposed</b>					
<b>Abstract Syntax</b>		<b>Transfer Syntax</b>		<b>Role</b>	<b>Extended Negotiation</b>
<b>Name</b>	<b>UID</b>	<b>Name List</b>	<b>UID List</b>		
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

For these SOP class all status codes with status Refused or Error are treated as failures and terminate the association and operation. On a failure, the request will be put in a holding queue for the user to manually retry the request. All status codes with status Warning or Success are treated as successes.



			operation	
	0122	SOP Class not Supported	Terminate the association and operation	(0000,0902)
Failed	A900	Identifier does not match SOP Class	Terminate the association and operation	(0000, 0901) (0000, 0902)
	Cxxx	Unable to process	Terminate the association and operation	(0000,0901) (0000,0902)
Success	0000	Matching is complete – 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	Receiving process of the matches continues.	Identifier
	FF01	Matches are continuing – Warning that one or more Optional Keys were not supported for existence for this Identifier	Receiving process of the matches continues without any warnings or errors	Identifier

**2.3.1.2.4 Real-World Activity D ('Image Store/End exam' Operation)**

**2.3.1.2.4.1 Associated Real-World Activity**

The Modality Performed Procedure Step messages are sent when the first image is acquired for the start of an exam and when the exam is ended (for the case where there are no images, the N-CREATE is sent when the exam is ended). For an exam with saved images or results, the N-SET will be sent with status COMPLETED. For an exam without saved images or results, the N-SET will be sent with status DISCONTINUED.

**2.3.1.2.4.2 Proposed Presentation Context Table**

<b>Presentation Context Table – Proposed</b>					
<b>Abstract Syntax</b>		<b>Transfer Syntax</b>		<b>Role</b>	<b>Extended Negotiation</b>
<b>Name</b>	<b>UID</b>	<b>Name List</b>	<b>UID List</b>		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None





**2.3.1.2.6.2 Proposed Presentation Context Tables**

<b>Presentation Context Table – Proposed</b>					
<b>Abstract Syntax</b>		<b>Transfer Syntax</b>		<b>Role</b>	<b>Extended Negotiation</b>
<b>Name</b>	<b>UID</b>	<b>Name List</b>	<b>UID List</b>		
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

**2.3.1.2.6.2.1 SOP Specific DICOM Conformance Statement for Study Root Query/Retrieve Information Model - FIND SOP Classes**

Only a single information model, Study Root, is supported.

All queries are initiated at the highest level of the information model (the STUDY level), and then for each response received, recursively repeated at the next lower levels (the SERIES and then IMAGE levels).

CANCEL requests can be issued during the queries via graphical user interface.

All status codes with status Refused or Error are treated as failures and terminate the association and operation. All status codes with status Warning or Success are treated as successes. LOGIQ P3 will only support hierarchical query.

**STUDY ROOT REQUEST IDENTIFIER FOR QUERY**

<b>Name</b>	<b>Tag</b>	<b>Types of Matching</b>	<b>Filtering is Supported</b>
<b>STUDY Level</b>			
Study Date	(0008,0020)	*, U,R	Yes
Study Time	(0008,0030)	S,*, U,R	-
Accession Number	(0008,0050)	*, U	Yes
Patient's Name	(0010,0010)	*, U	Yes
Patient ID	(0010,0020)	*, U	Yes
Study ID	(0020,0010)	S,*, U	-
Study Instance UID	(0020,000D)	UNIQUE	-
Modalities in Study	(0008,0061)	S,*, U	-
Referring Physician's Name	(0008,0090)	S,*, U	-
Study Description	(0008,1030)	S,*, U	-
Procedure Code Sequence	(0008,1032)	U	-
Name of Physician(s) Reading Study	(0008,1060)	S,*, U	-
Admitting Diagnoses Description	(0008,1080)	S,*, U	-
Referenced Study Sequence	(0008,1110)	U	-
Referenced Patient Sequence	(0008,1120)	U	-
Patient's Birth Date	(0010,0030)	S,*, U,R	-
Patient's Birth Time	(0010,0032)	S,*, U,R	-
Patient's Sex	(0010,0040)	S,*, U	-
Other Patient IDs	(0010,1000)	S,*, U	-
Other Patient Names	(0010,1001)	S,*, U	-
Patient's Age	(0010,1010)	S,*, U	-

Patient's Size	(0010,1020)	S,*,U	-
Patient's Weight	(0010,1030)	S,*,U	-
Ethnic Group	(0010,2160)	S,*,U	-
Occupation	(0010,2180)	S,*,U	-
Additional Patient History	(0010,21B0)	S,*,U	-
Patient Comments	(0010,4000)	S,*,U	-
Other Study Numbers	(0020,1070)	S,*,U	-
Number of Patient Related Studies	(0020,1200)	S,*,U	-
Number of Patient Related Series	(0020,1202)	S,*,U	-
Number of Patient Related Instances	(0020,1204)	S,*,U	-
Number of Study Related Series	(0020,1206)	S,*,U	-
Number of Study Related Instances	(0020,1208)	S,*,U	-
Interpretation Author	(4008,010C)	S,*,U	-
<b>Series Level</b>			
Modality	(0008,0060)	S,*,U	-
Series Number	(0020,0011)	S,*,U	-
Series Instance UID	(0020,000E)	UNIQUE	-
Number of Series Related Instances	(0020,1209)	S,*,U	-
Series Date	(0008,0021)	S,*,U,R	-
Series Time	(0008,0031)	S,*,U,R	-
Performing Physicians' Name	(0008,1050)	S,*,U	-
Protocol Name	(0018,1030)	S,*,U	-
Series Description	(0008,103E)	S,*,U	-
Operator's Name	(0008,1070)	S,*,U	-
Institutional Department Name	(0008,1040)	S,*,U	-
Software Versions	(0018,1020)	S,*,U	-
Performed Procedure Step Start Date	(0040,0244)	S,*,U,R	-
Performed Procedure Step Start Time	(0040,0245)	S,*,U,R	-
<b>Image Level</b>			
Instance Number	(0020,0013)	S,*,U	-
SOP Instance UID	(0008,0018)	UNIQUE	-
Contrast/Bolus Agent	(0018,0010)	S,*,U	-

Types of Matching:

- Single Value matching (S)
- Universal Matching (U)
- Wild Card Matching (\*)
- Range of date, Range of Time (R)

The types of Matching supported by the C-FIND SCU are: 'S' indicates the identifier attribute uses Single Value Matching, an 'R' indicates Range Matching, a "\*" indicates wildcard matching, a 'U' indicates Universal Matching, and 'UNIQUE' indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

"Filtering is supported" means that matching strings can be controlled from the Search screen at Patient - Data Transfer. All other matching fields can be configured in Config screen to be either enabled, enabled with a matching string value or disabled. The constant value will be used as entered by user.

**2.3.1.2.6.2.2 SOP Specific DICOM Conformance Statement for Study Root Query/Retrieve Information Model - MOVE SOP Classes**

All status codes with status Refused or Error are treated as failures and terminate the association and operation. All status codes with status Warning or Success are treated as successes.

**2.3.1.3 Association Acceptance Policy**

The AE accepts an association when it receives a Verification Request from another network device or a store request from a Q/R SCP or a Storage Commitment result from a Storage Commitment SCP.

**2.3.1.3.1 Real-World Activity B – ('Echo' operation)**

**2.3.1.3.1.1 Associated Real-World Activity**

An incoming Verification Request will cause the AE to accept the association and respond with a Verification Response.

**2.3.1.3.1.2 Accepted Presentation Context Table**

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	Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None

**2.3.1.3.1.2.1 SOP Specific DICOM Conformance Statement for Verify SOP Class**

The AE provides standard conformance to the Verification SOP Class as an SCP. The port number used is configured on Config screen, default is 104.

**2.3.1.3.1.3 Presentation Context Acceptance Criterion**

No criterion.

**2.3.1.3.1.4 Transfer Syntax Selection Policies**

The selected transfer syntax is based on the proposed transfer syntax list. The priority order is Explicit VR Little Endian, Explicit VR Big Endian and Implicit VR Little Endian

**2.3.1.3.2 Real-World Activity F ('Exam Retrieve' Operation)**

**2.3.1.3.2.1 Associated Real-World Activity**

If the user has initiated a retrieve by a C-MOVE-RQ, the AE will accept associations for C-STORE-RQs. The images will be stored locally.

**2.3.1.3.2.2 Accepted Presentation Context Table**

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

Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14) Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian Run Length Encoding, RLE	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2 1.2.840.10008.1.2.5	SCP	None
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14) Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian Run Length Encoding, RLE	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2 1.2.840.10008.1.2.5	SCP	None
Ultrasound Image Storage (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14) Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian Run Length Encoding, RLE	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2 1.2.840.10008.1.2.5	SCP	None
Ultrasound Multi-frame Image Storage (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14) Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian Run Length Encoding, RLE	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2 1.2.840.10008.1.2.5	SCP	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Baseline JPEG Lossless Non Hierarchical (Process 14) Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian Run Length Encoding, RLE	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2 1.2.840.10008.1.2.5	SCP	None

**2.3.1.3.2.2.1 SOP Specific DICOM Conformance Statement for Storage SOP Classes**

The AE provides standard conformance to the Storage SOP Classes as an SCP. The port number used is configured in Config screen, default is 104.

**2.3.1.3.2.3 Presentation Context Acceptance Criterion**

No criterion.









































































































































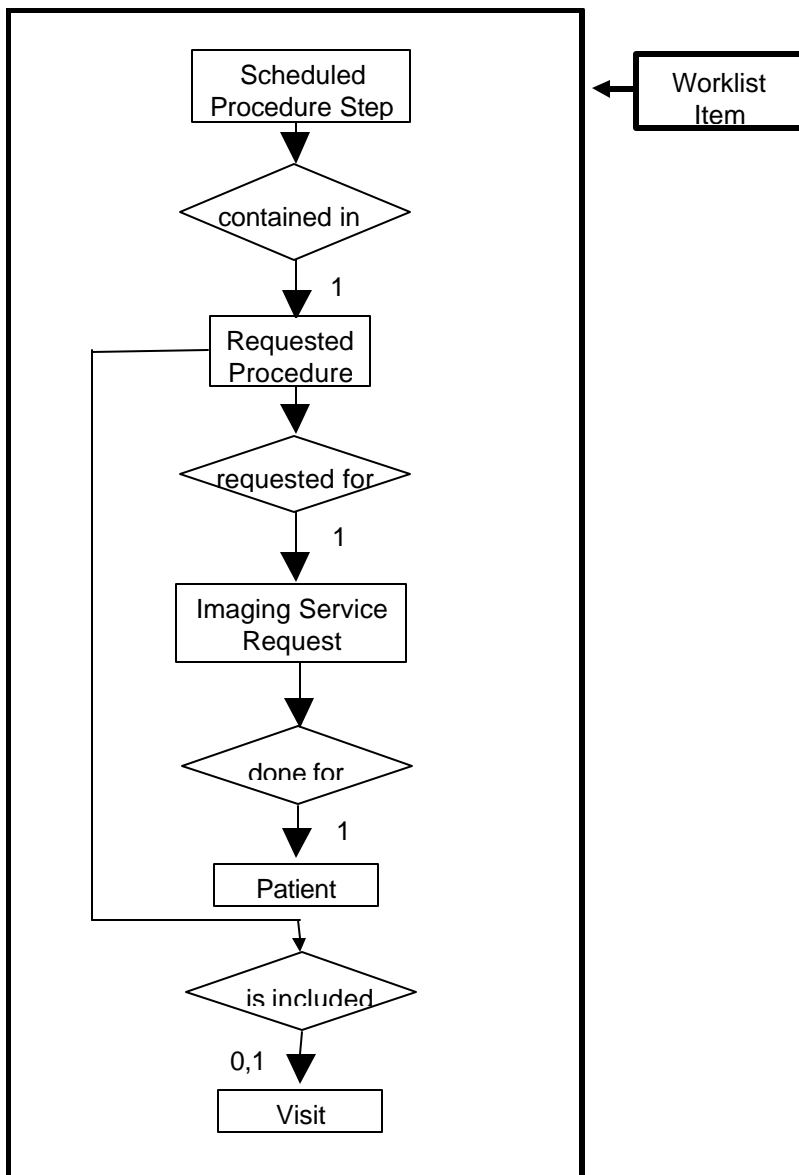








ILLUSTRATION 9.3-1  
MODALITY WORKLIST INFORMATION MODEL E/R DIAGRAM



**9.3.1 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.

**9.3.1.1 Scheduled Procedure Step**

Schedule Procedure Step is implemented in a basic form to allow for the user to retrieve a subset of attributes.

**9.3.1.2 Requested Procedure Entity Description**

Requested Procedure Step is implemented in a basic form to allow for the user to retrieve a subset of attributes.

**9.3.1.3 Imaging Service Request Entity Description**

Image Service is implemented in a basic form to allow for the user to retrieve a subset of attributes.

**9.3.1.4 Visit Entity Description**

Visit Entity is implemented in a basic form to allow for the user to retrieve a subset of attributes.

**9.3.1.5 Patient Entity Description**

Patient Entity Description is implemented in a basic form to allow for the user to retrieve a subset of attributes.

**9.3.2 LOGIQ e Mapping of DICOM entities**

**TABLE 9.3-1**  
**MAPPING OF DICOM ENTITIES TO LOGIQ E ENTITIES**

DICOM	LOGIQ e Entity
Scheduled Procedure Step	Not Applicable
Requested Procedure	Exam
Imaging Service Request	Exam
Visit	Not Applicable
Patient	Patient

**9.4 INFORMATION MODEL MODULE TABLE**

Within an entity of the DICOM 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 Section 9.4-1 identifies the defined modules within the entities that comprise the DICOM Modality Worklist Information Model. Modules are identified by Module Name. See DICOM PS 3.3 and PS 3.4 for a complete definition of the entities, modules, and attributes.

**TABLE 9.4-1  
MODALITY WORKLIST INFORMATION MODEL MODULES**

Entity Name	Module Name	Reference
Scheduled Procedure Step	SOP Common	9.5.2.1
	Scheduled Procedure Step	9.5.2.2
Requested Procedure	Requested Procedure	9.5.3.1
Imaging Service Request	Imaging Service Request	9.5.4.1
Visit	Visit Identification	9.5.5.1
	Visit Status	9.5.5.2
	Visit Relationship	9.5.5.3
	Visit Admission	Not Used
Patient	Patient Relationship	Not Used
	Patient Identification	9.5.6.1
	Patient Demographic	9.5.6.2
	Patient Medical	9.5.6.3

## 9.5 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 Standard PS 3.4 (Service Class Specifications). The term Instance is used for Images and Reports in examinations, that are based on Worklist entries.

### 9.5.1 Supported Matching

Following are the types of matching that can be requested by the implementation:

- Single Value Matching.
- Wild Card Matching.
- Range of date.

Fields with “Filtering is supported” in the Matching column can be controlled from the Search screen.

All non-required matching fields can be configured in Configuration screen to be either enabled, enabled with a constant value or disabled. The constant value will be used as entered by user. Returned values,



particularly those not mapped into the images or MPPSs, are viewable by the user by using the “DICOM Properties” button in the user interface.

## 9.5.2 Scheduled Procedure Step Entity

### 9.5.2.1 SOP Common Module

**TABLE SECTION 9.5-1  
SOP COMMON MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Specific Character Set	(0008,0005)	O	1C	Yes/Yes	Attribute is supported if the query contains matching keys in other than the default character repertoire. ISO IR 100 or ISO 2022 IR 87 is supported in responses.

### 9.5.2.2 Scheduled Procedure Step Module

**TABLE SECTION 9.5-2  
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Scheduled Procedure Step Sequence	(0040,0100)	R	1	No/No	Matching is supported.
>Scheduled Station AE Title	(0040,0001)	R	1	No/No	Matching is supported.
>Scheduled Procedure Step Start Date	(0040,0002)	R	1	No/No	Matching is supported. Filtering is supported.
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	No/No	Matching is supported.
>Modality	(0008,0060)	R	1	Yes/Yes (but always “US”)	Matching is supported.
>Scheduled Performing Physician’s Name	(0040,0006)	R	2	Yes/Yes (to Performing Physician’s Name)	Matching is supported.
>Scheduled Procedure Step Description	(0040,0007)	O	1C	Yes/Yes	Matching is supported.
>Scheduled Station Name	(0040,0010)	O	2	No/No	Matching is supported.

>Scheduled Procedure Step Location	(0040,0011)	O	2	No/No	Matching is supported.
>Scheduled Procedure Step ID	(0040,0009)	O	1	Yes/Yes	Matching is supported.
>Scheduled Protocol Code Sequence	(0040,0008)	O	1C	Yes/Yes	Matching is supported.

### 9.5.3 Requested Procedure Entity

#### 9.5.3.1 Requested Procedure Module

**TABLE SECTION 9.5-3  
REQUESTED PROCEDURE MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Requested Procedure ID	(0040,1001)	O	1	Yes/Yes (to Requested Procedure ID and Study ID)	Matching is supported. Filtering is supported.
Requested Procedure Description	(0032,1060)	O	1C	Yes/Yes (to Study Description and Requested Procedure Description)	Matching is supported.
Requested Procedure Code Sequence	(0032,1064)	O	1C	No/Yes	Matching is supported.
Requested Procedure Comments	(0040,1400)	O	3	No/No	Matching is supported.
Study Instance UID	(0020,000D)	O	1	Yes/Yes	Matching is supported.
Referenced Study Sequence	(0008,1110)	O	2	Yes/Yes	Matching is supported.
>Referenced SOP Class UID	(0008,1150)	O	1C	Yes/Yes	Matching is supported.
>Referenced SOP Instance UID	(0008,1155)	O	1C	Yes/Yes	Matching is supported.

Names of Intended Recipients of Results	(0040,1010)	O	3	Yes/No (to Physician(s) of Record)	Matching is supported.
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#### 9.5.4 Imaging Service Request Entity

##### 9.5.4.1 Imaging Service Request Module

**TABLE SECTION 9.5-4  
IMAGING SERVICE REQUEST MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Accession Number	(0008,0050)	O	2	Yes/Yes	Matching is supported. Filtering is supported.
Referring Physician's Name	(0008,0090)	O	2	Yes/No	Matching is supported.
Imaging Service Request Comments	(0040,2400)	O	3	No/No	Matching is supported.
Requesting Physician	(0032,1032)	O	2	No/No	Matching is supported.
Requesting Service	(0032,1033)	O	3	No/No	Matching is supported.

#### 9.5.5 Visit Entity

##### 9.5.5.1 Visit Identification

**TABLE SECTION 9.5-5  
VISIT IDENTIFICATION MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Admission ID	(0038,0010)	O	2	No/No	Matching is supported.

##### 9.5.5.2 Visit Status

**TABLE SECTION 9.5-6  
VISIT STATUS MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
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Current Patient Location	(0038,0300)	O	2	No/No	Matching is supported.
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**9.5.5.3 Visit Relationship**

**TABLE SECTION 9.5-7  
VISIT RELATIONSHIP MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Referenced Patient Sequence	(0008,1120)	O	2	Yes/Yes	Matching is supported.
>Referenced SOP Class UID	(0008,1150)	O	2	Yes/Yes	Matching is supported.
>Referenced SOP Instance UID	(0008,1155)	O	2	Yes/Yes	Matching is supported.

**9.5.6 Patient Entity**

**9.5.6.1 Patient Identification**

**TABLE SECTION 9.5-8  
PATIENT IDENTIFICATION MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Patient's Name	(0010,0010)	R	1	Yes/Yes	Matching is supported. Filtering is supported.
Patient ID	(0010,0020)	R	1	Yes/Yes	Matching is supported. Filtering is supported.
Other Patient Ids	(0010,1000)	O	3	Yes/No	Matching is supported.

**9.5.6.2 Patient Demographic**

**TABLE SECTION 9.5-9  
PATIENT DEMOGRAPHIC MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Patients Birth Date	(0010,0030)	O	2	Yes/Yes	Matching is supported. Filtering is supported.
Patients Birth Time	(0010,0032)	O	3	Yes/No	Matching is supported.

Patient's Sex	(0010,0040)	O	2	Yes/Yes	Matching is supported Filtering is supported.
Patient's Size	(0010,1020)	O	3	Yes/No	Matching is supported.
Patient's Weight	(0010,1030)	O	2	Yes/No	Matching is supported.
Ethnic Group	(0010,2160)	O	3	Yes/No	Matching is supported.
Patient Comments	(0010,4000)	O	3	Yes/No	Matching is supported.

### 9.5.6.3 Patient Medical

**TABLE SECTION 9.5-10  
PATIENT MEDICAL MODULE ATTRIBUTES**

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance/MPPS	Matching
Additional Patient History	(0010,21B0)	O	3	Yes/No	Matching is supported.
Contrast Allergies	(0010,2210)	O	2	No/No	Matching is supported.
Medical Alerts	(0010,2000)	O	2	No/No	Matching is supported.
Pregnancy Status	(0010,21C0)	O	2	No/No	Matching is supported.

## 10. ANNEX F – MODALITY PERFORMED PROCEDURE STEP SOP CLASS IMPLEMENTATION

### 10.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the Modality Performed Procedure Step SOP Class, the optional attributes and service elements supported, the valid range of values for mandatory and optional attributes, and the status code behavior.

### 10.2 MODALITY PERFORMED PROCEDURE STEP SOP CLASS DEFINITION

In this section, supported means that tag is sent with value if entered by user or from worklist.

#### 10.2.1 IOD Description

This is the description of the DICOM tags to be sent for Modality Performed Procedure Step SOP class:

#### Modality Performed Procedure Step Sop Class N-CREATE, N-SET and Final State Attributes

Attribute Name	Tag	Req. Type N-CREATE	Req. Type N-SET
<b>Performed Procedure Step Relationship</b>			
Scheduled Step Attribute Sequence	(0040,0270)	1	Not allowed
>Study Instance UID	(0020,000D)	1	Not allowed
>Referenced Study Sequence	(0008,1110)	2, supported	Not allowed
>>Referenced SOP Class UID	(0008,1150)	1C, supported	Not allowed
>>Referenced SOP Instance UID	(0008,1155)	1C, supported	Not allowed
>Accession Number	(0008,0050)	2, supported	Not allowed
>Placer Order Number/Imaging Service Request	(0040,2016)	3, not supported	Not allowed
>Filler Order Number/Imaging Service Request	(0040,2017)	3, not supported	Not allowed
>Requested Procedure ID	(0040,1001)	2, supported	Not allowed
>Requested Procedure Description	(0032,1060)	2, supported	Not allowed
>Scheduled Procedure Step ID	(0040,0009)	2, supported	Not allowed
>Scheduled Procedure Step Description	(0040,0007)	2, supported	Not allowed
>Scheduled Protocol Code Sequence	(0040,0008)	2, supported	Not allowed
>>Include 'Code Sequence Macro'			
Patient's Name	(0010,0010)	2, supported	Not allowed
Patient ID	(0010,0020)	2, supported	Not allowed
Patient's Birth Date	(0010,0032)	2, supported	Not allowed
Patient's Sex	(0010,0040)	2, supported	Not allowed
>Referenced Patient Sequence	(0008,1120)	2, supported	Not allowed

Attribute Name	Tag	Req. Type N-CREATE	Req. Type N-SET
>>Referenced SOP Class UID	(0008,1150)	1C, supported	Not allowed
>>Referenced SOP Instance UID	(0008,1155)	1C, supported	Not allowed
<b>Performed Procedure Step Information</b>			
Performed Procedure Step ID	(0040,0253)	1	Not allowed
Performed Station AE Title	(0040,0241)	1	Not allowed
Performed Station Name	(0040,0242)	2, supported	Not allowed
Performed Location	(0040,0243)	2, supported (Institution Name, truncated if necessary to 16 characters)	Not allowed
Performed Procedure Step Start Date	(0040,0244)	1	Not allowed
Performed Procedure Step Start Time	(0040,0245)	1	Not allowed
Performed Procedure Step Status	(0040,0252)	1	3, supported
Performed Procedure Step Description	(0040,0254)	2, supported	3, supported
Performed Procedure Type Description	(0040,0255)	2, always empty	2, always empty
Procedure Code Sequence	(0008,1032)	2, supported	3, supported
>Include 'Code Sequence Macro'			
Performed Procedure Step End Date	(0040,0250)	2, always empty	3, supported
Performed Procedure Step End Time	(0040,0251)	2, always empty	3, supported
<b>Image Acquisition Results</b>			
Modality	(0008,0060)	1	Not allowed
Study ID	(0020,0010)	2, supported	Not allowed
Performed Protocol Code Sequence	(0040,0260)	2, supported	3, supported
>Include 'Code Sequence Macro'			
Performed Series Sequence	(0040,0340)	2, always empty	3, supported
>Performing Physician's Name	(0008,1050)	2C (Required if Sequence Item is present)	2C (Required if Sequence Item is present)
>Protocol Name	(0018,1030)	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)
>Operator's Name	(0008,1070)	2C (Required if Sequence Item is present)	2C (Required if Sequence Item is present)

Attribute Name	Tag	Req. Type N-CREATE	Req. Type N-SET
>Series Instance UID	(0020,000E)	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)
>Series Description	(0008,103E)	2C (Required if Sequence Item is present)	2C (Required if Sequence Item is present)
>Retrieve AE Title	(0008,0054)	2C (Required if Sequence Item is present)	2C (Required if Sequence Item is present)
>Referenced Image Sequence	(0008,1140)	2C (Required if Sequence Item is present)	2C (Required if Sequence Item is present)
>>Referenced SOP Class UID	(0008,1150)	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)
>>Referenced SOP Instance UID	(0008,1155)	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)
>Referenced Non-Image Composite SOP Instance Sequence	(0040,0220)	2C (Required if Sequence Item is present)	2C (Required if Sequence Item is present)
>>Referenced SOP Class UID	(0008,1150)	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)
>>Referenced SOP Instance UID	(0008,1155)	1C (Required if Sequence Item is present)	1C (Required if Sequence Item is present)
>Referenced Frame Number	(0008,1160)	3, not supported	3, not supported

## 10.2.2 Operations

### Action Information

Covered under IOD Description in Section 10.2.1

#### 10.2.2.1 Service Class User Behavior

LOGIQ e sends N-CREATE when first image in examination is acquired or when the exam is ended for the case where there are no images



LOGIQ e sends N-SET after the exam is ended. The N-SET will include all acquired images' UIDs and the status of COMPLETED or DISCONTINUED.

#### **10.2.2.2 Status Codes**

No Service Class specific status values are defined for the N-ACTION Service. See PS 3.7 for general response status codes.

## 11. ANNEX G - STORAGE COMMITMENT PUSH MODEL SOP CLASS IMPLEMENTATION

### 11.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the Storage Commitment Push Model SOP Class, the optional attributes and service elements supported, the valid range of values for mandatory and optional attributes, and the status code behavior.

### 11.2 STORAGE COMMITMENT PUSH MODEL SOP CLASS DEFINITION

#### 11.2.1 IOD Description

##### 11.2.1.1 STORAGE COMMITMENT MODULE

TABLE 11.2-1  
STORAGE COMMITMENT MODULE

Attribute Name	Tag	Attribute Description
Transaction UID	(0008,1195)	Uniquely generated by the equipment
Retrieve AE Title	(0008,0054)	Not used
Storage Media File-Set ID	(0088,0130)	Not used
Storage Media File-Set UID	(0088,0140)	Not used
Referenced SOP Sequence	(0008,1199)	Supported
>Referenced SOP Class UID	(0008,1150)	Supported
>Referenced SOP Instance UID	(0008,1155)	Supported
>Retrieve AE Title	(0008,0054)	Not used
>Storage Media File-Set ID	(0088,0130)	Not used
>Storage Media File-Set UID	(0088,0140)	Not used
Failed SOP Sequence	(0008,1198)	Supported
>Referenced SOP Class UID	(0008,1150)	Supported
>Referenced SOP Instance UID	(0008,1155)	Supported
>Failure Reason	(0008,1197)	Supported

#### 11.2.2 DIMSE Service Group

DIMSE Service Element	Usage SCU/SCP
N-EVENT-REPORT	M/M
N-ACTION	M/M

### 11.2.3 Operations

#### 11.2.3.1 Action Information

Covered under IOD Description in Table 11.2.1

#### 11.2.3.2 Service Class User Behavior

LOGIQ e sends the N-ACTION primitive (Storage Commitment Request) after successful exam save to a DICOM Storage SCP.

LOGIQ e may request storage commitment for all generated SOP Class UIDs:

Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1
Ultrasound Multi-frame Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.3
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Ultrasound Image Storage (Retired)	1.2.840.10008.5.1.4.1.1.6
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

The association for the N-ACTION is disconnected after processing the response. Thus, the N-EVENT-REPORT must be sent on a separate association.

The Referenced Study Component Sequence Attribute is not supported.

The Transaction UID is valid for two days. If no answer is received, the request will be removed without warning the user.

The optional Storage Media File-Set ID & UID Attributes in the N-ACTION are not supported.

On receipt of an unsuccessful N-ACTION Response Status Code from the SCP, the request will be put in a holding queue for the user to manually retry the request.

#### 11.2.3.3 Status Codes

**11.2.4 No Service Class specific status values are defined for the N-ACTION Service. See PS 3.7 for general response status codes.**

LOGIQ e will only listen for an N-EVENT-REPORT from the SCP in a new association on the listen port for Verification and Storage Commitment.

11.2.4.1 Event Information

TABLE 11.2-2  
STORAGE COMMITMENT RESULT - EVENT INFORMATION

Event Type Name	Event Type ID	Attribute	Tag	Requirement Type SCU/SCP		
Storage Commitment Request Successful	1	Transaction UID	(0008,1195)	-/1		
		Retrieve AE Title	(0008,0054)	Not used		
		Storage Media File -Set ID	(0088,0130)	Not used		
		Storage Media File -Set UID	(0088,0140)	Not used		
		Referenced SOP Sequence	(0008,1199)	-/1		
		>Referenced SOP Class UID	(0008,1150)	-/1		
		>Referenced SOP Instance UID	(0008,1155)	-/1		
		>Retrieve AE Title	(0008,0054)	Not used		
		>Storage Media File -Set ID	(0088,0130)	Not used		
		>Storage Media File -Set UID	(0088,0140)	Not used		
		Storage Commitment Request Complete - Failures Exist	2	Transaction UID	(0008,1195)	-/1
				Retrieve AE Title	(0008,0054)	Not used
Storage Media File -Set ID	(0088,0130)			Not used		
Storage Media File -Set UID	(0088,0140)			Not used		
Referenced SOP Sequence	(0008,1199)			-/1C		
>Referenced SOP Class UID	(0008,1150)			-/1		
>Referenced SOP Instance UID	(0008,1155)			-/1		
>Retrieve AE Title	(0008,0054)			Not used		
>Storage Media File -Set ID	(0088,0130)			Not used		

		>Storage Media File-Set UID	(0088,0140)	Not used
		Failed SOP Sequence	(0008,1198)	-/1
		>Referenced SOP Class UID	(0008,1150)	-/1
		>Referenced SOP Instance UID	(0008,1155)	-/1
		>Failure Reason	(0008,1197)	-/1

#### 11.2.4.2 Service Class User Behavior

If a successful answer is received, the request will be removed without warning the user.

If a non-successful answer is received, the request will be left in the holding queue.

If no answer is received, the request will be removed without warning the user after two days.

#### 11.2.4.3 Status Codes

No Service Class specific status values are defined for the N-EVENT-REPORT Service. See PS 3.7 for general response status code.

## 12. ANNEX H – PRINT MANAGEMENT SOP CLASS IMPLEMENTATION

### 12.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the supported Print Management SOP and Meta SOP Classes, the optional attributes and service elements supported, the valid range of values for mandatory and optional attributes, and the status code behavior.

Section 12.2- Basic Print Management Meta SOP Classes

Section 12.3 - Print Management SOP Class Definitions

Section 12.4 - Print Management IODs

Section 12.5 - IOD Module Definition

### 12.2 BASIC PRINT MANAGEMENT META SOP CLASSES

The Basic Print Management Meta SOP Classes correspond with the minimum functionality that an implementation of the Print Management Service Class shall support.

LOGIQ e supports the Basic Grayscale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class. These are defined in Table 12.2.1-1 and Table 12.2.2-1.

#### 12.2.1 Basic Grayscale Print Management Meta SOP Class

The Basic Grayscale Print Management Meta SOP Class is defined by the following set of supported SOP Classes.

**TABLE 12.2.1-1 BASIC GRAYSCALE PRINT MANAGEMENT META SOP CLASS**

SOP Class Name	Usage SCU	Reference
Basic Film Session SOP Class	M	see 12.3.1
Basic Film Box SOP Class	M	see 12.3.2
Basic Grayscale Image Box SOP Class	M	see 12.3.3.1
Printer SOP Class	M	see 12.3.4

#### 12.2.2 Basic Color Print Management Meta SOP Class

The Basic Color Print Management Meta SOP Class is defined by the following set of supported SOP Classes

**TABLE 12.2.2-1 BASIC COLOR PRINT MANAGEMENT META SOP CLASS**

SOP Class Name	Usage SCU	Reference
Basic Film Sessstion SOP Class	M	see 12.3.1
Basic Film Box SOP Class	M	see 12.3.2
Basic Color Image Box SOP Class	M	see 12.3.3.2
Printer SOP Class	M	see 12.4.4

**12.3 PRINT MANAGEMENT SOP CLASS DEFINITIONS**

**12.3.1 Basic Film Session SOP Class**

The Basic Film Session IOD describes the presentation parameters, which are common for all the films of a film session. The DIMSE services that are applicable to the IOD are shown inTable 12.3.1-1.

**TABLE 12.3.1-1 DIMSE SERVICE GROUP**

DIMSE Service Element	Usage SCU	Reference
N-CREATE	M	see 12.3.1.1.1
N-SET	U	see 12.3.1.1.2
N-DELETE	U	see 12.3.1.1.3
N-ACTION	U	see 12.3.1.1.4

**12.3.1.1 DIMSE Service Group**

**12.3.1.1.1 N-CREATE**

The N-CREATE DIMSE Service is used by LOGIQ e to request that the SCP (printer) create a Film Session SOP InstanceTable 12.3 .2-1 defines the Basic Film Session Presentation Module attributes used in this request.

**12.3.1.1.2 N-SET**

Not used in this implementation.

**12.3.1.1.3 N-DELETE**

Not used in this implementation.

**12.3.1.1.4 N-ACTION**

Not used in this implementation

**12.3.2 Basic Film Box SOP Class**

The Basic Film Box IOD is an abstraction of the presentation of one film of the film session. The DIMSE services that are applicable to the IOD are shown in Table 12.3.2-1.

TABLE 12.3.2-1 DIMSE SERVICE GROUP

DIMSE Service Element	Usage SCU	Reference
N-CREATE	M	see 12.3.2.1.1
N-ACTION	M	see 12.3.2.1.2
N-DELETE	U	see 12.3.2.1.3
N-SET	U	see 12.3.2.1.4

**12.3.2.1 DIMSE Service Group**

**12.3.2.1.1 N-CREATE**

The N-CREATE DIMSE Service is used by LOGIQ e to request that the SCP create a Film Box SOP Instance. Table 12.3 .2-1 defines the Basic Film Box Presentation Module attributes used in this request.

**12.3.2.1.2 N-ACTION**

The N-ACTION DIMSE Service is used by LOGIQ e to request the SCP (printer) to print the number of copies configured by the user to a film of the film session.

**12.3.2.1.3 N-DELETE**

The N-DELETE DIMSE Service is used by LOGIQ e to request the SCP (printer) to delete the complete Film Box. The root Film Box Instance UID is sent to the SCP to accomplish this.

**12.3.2.1.4 N-SET**

Not used in this implementation.

**12.3.3 Image Box SOP Class**

**12.3.3.1 Basic Grayscale Image Box SOP Class**

The Basic Grayscale Image Box IOD is an abstraction of the presentation of an image and image related data in the image area of a film. The DIMSE services that are applicable to the IOD are shown in Table 12.3.3-1.

TABLE 12.3.3-1 DIMSE SERVICE GROUP

DIMSE Service Element	Usage SCU	Reference
N-SET	M	see 12.3.3.1.1

**12.3.3.1.1 DIMSE Service Group (N-SET)**

The N-SET DIMSE Service is used by LOGIQ e to update the Basic Grayscale Image Box SOP Instance. Table defines the Basic Image Box Presentation Module attributes used.



**12.3.3.2 Basic Color Image Box SOP Class**

The Basic Color Image Box IOD is an abstraction of the presentation of an image and image related data in the image area of a film. The DIMSE services that are applicable to the IOD are shown in Table 12.3.3-2.

**TABLE 12.3.3-2 DIMSE SERVICE GROUP**

<b>DIMSE Service Element</b>	<b>Usage SCU</b>	<b>Reference</b>
N-SET	M	see 12.3.3.2.1

**12.3.3.2.1 DIMSE Service Group (N-SET)**

The N-SET DIMSE Service is used by LOGIQ e to update the Basic Color Image Box SOP Instance. Table 12.5.2-5 defines the Basic Image Box Presentation Module attributes used.

**12.3.4 Printer SOP Class**

The Printer IOD is an abstraction of the hard copy printer and is the basic Information Entity to monitor the status of the printer. The DIMSE services that are applicable to the IOD are shown in table 11.3.4-1.

**12.3.4.1 DIMSE Service Group****TABLE 12.3.4-1 DIMSE SERVICE GROUP**

<b>DIMSE Service Element</b>	<b>Usage SCU</b>	<b>Reference</b>
N-EVENT-REPORT	M	see 12.3.4.1.
N-GET	U	see 12.3.4.2

**12.3.4.1.1 N-EVENT\_REPORT**

LOGIQ e confirms the N-EVENT-REPORT initiated by the SCP (printer).

**12.3.4.1.2 N-GET**

Used by LOGIQ e to request the SCP to get a Printer SOP Instance. Table 12.5.2.6 defines the Printer Module attributes.

**12.4 PRINT MANAGEMENT IODS**

Within an entity of a DICOM Print Management, attributes are grouped into a 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 12.4 .1-1, Table 12.4 .2-1 , Table 12.4 .3-1 , and Table 12.4 .4-1 identify the defined modules within the entities which comprise the DICOM Print Management Service IODs. Modules are identified by Module Name.

See DICOM for a complete definition of the entities, modules and attributes.

12.4.1 Film Session IOD Module

TABLE 12.4.1-1 FILM SESSION IOD MODULES

Module Name	Reference	Module Description
SOP Common Module	12.5 .1.1.	Contains SOP Common information
Basic Film Session Presentation Module	12.5 .2.1	Contains Film Session presentation information
Basic Film Session Relationship Module	12.5.2.2	References to related SOPs

12.4.2 Basic Film Box IOD Module Table

TABLE 12.4.2-1 BASIC FILM BOX IOD MODULES

Module Name	Reference
SOP Common Module	12.5 .1.1
Basic Film Box Presentation Module	12.5.2.3
Basic Film Box Relationship Module	12.5.2.4

12.4.3 Basic Image Box IOD Module Table

TABLE 12.4.3-1 BASIC IMAGE BOX IOD MODULES

Module Name	Reference
SOP Common Module	12.5.1.1
Image Box Pixel Presentation Module	12.5.2.5

12.4.4 Printer IOD Module Table

TABLE 12.4.4-1 PRINTER IOD MODULES

Module Name	Reference
SOP Common Module	12.5.1.1
Printer Module	12.5.2.6

12.5 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules that comprise the Print Management. The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported.

**12.5.1 General Modules****12.5.1.1 SOP Common Module**

This section defines the attributes that are required for proper functioning and identification of the associated SOP Instances. They do not specify any semantics about the Real-World Object represented by the IOD.

**TABLE 12.5.1-1 SOP COMMON MODULE ATTRIBUTES**

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	Varies with Module Instance and DIMSE Service being used. 1.2.840.100011.5.1.1.1 (Film Session) 1.2.840.100011.5.1.1.2 (Film Box) 1.2.840.100011.5.1.1.4 (Image Box)
SOP Instance UID	(0008,0018)	1	Provided by SCP (printer).
Specific Character Set	(0008,0005)	1C	Not used as expanded or replacement character sets not used.
Instance Creation Date	(0008,0012)	3	Not used.
Instance Creation Time	(0008,0013)	3	Not used.
Instance Creator UID	(0008,0014)	3	Not used.

**12.5.2 Print Management Modules**

For all user configurable tags with no default, no value will be sent if the tag is not configured.

**12.5.2.1 Basic Film Session Presentation Module**

This section defines the attributes that are common for all films of a film session. The attributes described in table 12. .2-1 apply when the N-CREATE DIMSE service is used.

**TABLE 12.5.2-1 BASIC FILM SESSION PRESENTATION MODULE ATTRIBUTES**

Attribute Name	Tag	USAGE (SCU)	Attribute Description
Number of Copies	(2000,0010)	U	Defined Terms used (user configurable): Default is 1. Max is 99.
Print Priority	(2000,0020)	U	Defined Terms used (user configurable): HIGH, MED, LOW . Default is HIGH.
Medium Type	(2000,0030)	U	Defined Terms used (user configurable): PAPER BLUE FILM CLEAR FILM Default is CLEAR FILM.
Film Destination	(2000,0040)	U	Defined Terms used (user configurable): MAGAZINE - default PROCESSOR
Film Session Label	(2000,0050)	U	User configurable. No default.
Memory Allocation	(2000,0060)	U	Not Used

**12.5.2.2 Basic Film Session Relationship Module**

**TABLE 12.5.2-2 BASIC FILM SESSION RELATIONSHIP MODULE ATTRIBUTES**

Attribute Name	Tag	USAGE (SCU)	Attribute Description
Referenced Film Box Sequence	(2000,0500)	U	Not used
>Referenced SOP Class UID	(0008,1150)	U	
>Referenced SOP Instance UID	(0008,1155)	U	

**12.5.2.3 Basic Film Box Presentation Module**

The attributes described in table 12.5.2-3 apply when the N-CREATE DIMSE service is used.

TABLE 12.5.2-3 BASIC FILM BOX PRESENTATION MODULE ATTRIBUTES

Attribute Name	Tag	USAGE (SCU)	Attribute Description
Image Display Format	(2010,0010)	M	Enumerated values used (user configurable): STANDARD\X,Y, where X and Y can take values from 1 to 5. Default is STANDARD\1,1.
Annotation Display Format ID	(2010,0030)	U	Not used.
Film Orientation	(2010,0040)	U	Defined Terms used (user configurable): PORTRAIT - default LANDSCAPE
Film Size ID	(2000,0050)	U	Defined Terms used (user configurable): 8INX10IN - default 10INX12IN 10INX14IN 11INX14IN 14INX14IN 14INX17IN 24CMX24CM 24CMX30CM
Magnification Type	(2010,0060)	U	Defined Terms Used (user configurable): REPLICATE BILINEAR CUBIC NONE
Smoothing Type	(2010,0080)	U	Free form text entry field (user configurable) and only sent if Magnification Type is CUBIC. No default
Border Density	(2010,0100)	U	Defined Terms Used (user configurable): BLACK WHITE Default is BLACK.
Empty Image Density	(2010,0110)	U	Defined Terms Used (user configurable): BLACK WHITE Default is WHITE.
Min Density	(2010,0120)	U	User configurable. Defaults to 0. Max is 999.
Max Density	(2010,0130)	U	User configurable. Defaults to 300. Max is 999.

Trim	(2010,0140)	U	Enumerated Values Used (user configurable): YES NO Default is NO.
Configuration Information	(2010,0150)	U	User configurable. No default.

#### 12.5.2.4 Basic Film Box Relationship Module

This section defines the attributes that describe the common parameters, which apply for all images on a given sheet of film.

**TABLE 12.5.2-4 BASIC FILM BOX RELATIONSHIP MODULE ATTRIBUTES**

Attribute Name	Tag	USAGE (SCU)	Attribute Description
Referenced Film Session Sequence	(2010,0500)	M	
>Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	(0008,1155)	M	Provided by SCP (printer)
Referenced Image Box Sequence	(2010,0510)	U	Not used
>Referenced SOP Class UID	(0008,1150)	U	
>Referenced SOP Instance UID	(0008,1155)	U	
Referenced Basic Annotation Sequence	(2010,0520)	U	Not used
>Referenced SOP Class UID	(0008,1150)	U	
>Referenced SOP Instance UID	(0008,1155)	U	

#### 12.5.2.5 Image Box Pixel Presentation Module

The attributes described in table 12.5 B-5 apply when the DIMSE Service N-SET is used.

**TABLE 12.5 12.5.2-5 IMAGE BOX PIXEL PRESENTATION MODULE ATTRIBUTES**

Attribute Name	Tag	USAGE (SCU)	Attribute Description
Image Position	(2020,0010)	M	Based on the image display format.
Polarity	(2020,0020)	U	Defined term, NORMAL
Requested Image Size	(2020,0030)	U	Not sent
Basic Grayscale Image Sequence	(2020,0110)	M	
>Samples Per Pixel	(0028,0002)	M	Value = '1'
>Photometric Interpretation	(0028,0004)	M	Defined Term MONOCHROME2 used
>Rows	(0028,0010)	M	Value depends on scanning mode and configuration setup.
>Columns	(0028,0011)	M	Value depends on scanning mode and configuration setup.
>Pixel Aspect Ratio	(0028,0034)	MC	Not used
>Bits Allocated	(0028,0100)	M	Value always = 0008H
>Bits Stored	(0028,0101)	M	Value always = 0008H
>High Bit	(0028,0102)	M	Value always = 0007H
>Pixel Representation	(0028,0103)	M	Defined Value '0' - unsigned integer
>Pixel Data	(7FE0,0010)	M	
Basic Color Image Sequence	(2020,0111)	M	
>Samples Per Pixel	(0028,0002)	M	Value = '3'
>Photometric Interpretation	(0028,0004)	M	Defined Term RGB used
>Rows	(0028,0010)	M	Value depends on scanning mode and configuration setup.
>Columns	(0028,0011)	M	Value depends on scanning mode and configuration setup.
>Pixel Aspect Ratio	(0028,0034)	MC	Not used
>Bits Allocated	(0028,0100)	M	Value always = 0008H
>Bits Stored	(0028,0101)	M	Value always = 0008H
>High Bit	(0028,0102)	M	Value always = 0007H
>Pixel Representation	(0028,0103)	M	Defined Value '0' - unsigned integer
>Pixel Data	(7FE0,0010)	M	
Planar Configuration	(0028, 0006)	M	0001H, color-by-plane, when Basic Color Image Sequence is set

**12.5.2.6 Printer Module**

This section defines the attributes that are used to monitor the status of the printer. The attributes described in Table 12.5 B-6 apply when the DIMSE Service N-GET is used.

TABLE 12.5.2-6 PRINTER MODULE ATTRIBUTES

Attribute Name	Tag	USAGE (SCU)	Attribute Description
Printer Status	(2110,0010)	U	Used to check the status of the printer before a print operation is started. If the status is different from 0x0, Success the print operation is aborted, a message is displayed and the print files reside in the print buffer.
Printer Status Info	(2110,0020)	U	If return status is "FAILURE" an error message is displayed, and the print files resides in the print buffer.
Printer Name	(2110,0030)	U	Requested, but not used
Manufacturer	(0008,0070)	U	Requested, but not used
Manufacturer Model Name	(0008,1090)	U	Requested, but not used
Device Serial Number	(0018,1000)	U	Requested, but not used
Software Versions	(0018,1020)	U	Requested, but not used
Date Last Calibration	(0018,1200)	U	Requested, but not used
Last Calibration	(0018,1201)	U	Requested, but not used



## **13. ANNEX H – STUDY ROOT RETRIEVE INFORMATION MODEL IMPLEMENTATION**

### **13.1 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:

Section 13.2 - Information Model Description

Section 13.3- Information Model Entity-Relationship Model

Section 13.4- Information Model Keys

### **13.2 STUDY ROOT INFORMATION MODEL DESCRIPTION**

This section defines the implementation of Study Root Query/Retrieve Information Model.

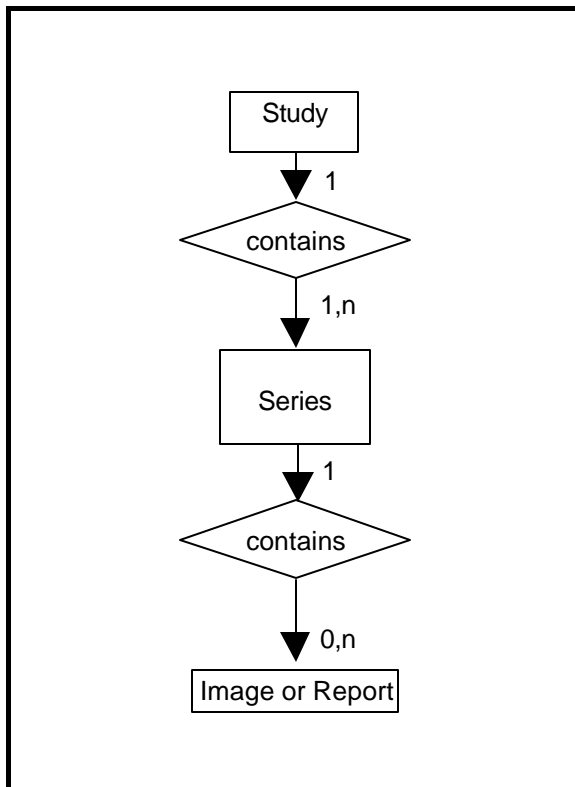
### **13.3 STUDY ROOT INFORMATION MODEL ENTITY-RELATIONSHIP MODEL**

The Entity-Relationship diagram for the Study Root Information Model schema is shown in Illustration Section 13.3-1. 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 ERROR! REFERENCE SOURCE NOT FOUND.-1  
STUDY ROOT QUERY/RETRIEVE INFORMATION MODEL E/R DIAGRAM**



**13.3.1 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.

**13.3.2 LOGIQ e Mapping of DICOM entities**

**TABLE 13.3-1  
MAPPING OF DICOM ENTITIES TO LOGIQ E ENTITIES**

DICOM	LOGIQ e Entity
Study	Exam
Series	Exam
Image	Image

**13.4 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 Standard PS 3.4 (Service Class Specifications).

13.4.1 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 SECTION 13.4-2  
STUDY LEVEL ATTRIBUTES FOR THE STUDY ROOT  
QUERY/RETRIEVE INFORMATION MODEL**

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	U
Study ID	(0020,0010)	R
Study Instance UID	(0020,000D)	U
Modalities in Study	(0008,0061)	R
Referring Physician's Name	(0008,0090)	R
Study Description	(0008,1030)	O
Procedure Code Sequence	(0008,1032)	O
>Include 'Code Sequence Macro'		
Name of Physician(s) Reading Study	(0008,1060)	O
Admitting Diagnoses Description	(0008,1080)	O
Referenced Study Sequence	(0008,1110)	O
>Referenced SOP Class UID	(0008,1150)	O
>Referenced SOP Instance UID	(0008,1155)	O
Referenced Patient Sequence	(0008,1120)	O
>Referenced SOP Class UID	(0008,1150)	O
>Referenced SOP Instance UID	(0008,1155)	O
Patient's Birth Date	(0010,0030)	O
Patient's Birth Time	(0010,0032)	O
Patient's Sex	(0010,0040)	O
Other Patient IDs	(0010,1000)	O
Other Patient Names	(0010,1001)	O
Patient's Age	(0010,1010)	O
Patient's Size	(0010,1020)	O
Patient's Weight	(0010,1030)	O
Ethnic Group	(0010,2160)	O
Occupation	(0010,2180)	O
Additional Patient History	(0010,21B0)	O
Patient Comments	(0010,4000)	O
Other Study Numbers	(0020,1070)	O
Number of Patient Related Studies	(0020,1200)	O

Number of Patient Related Series	(0020,1202)	O
Number of Patient Related Instances	(0020,1204)	O
Number of Study Related Series	(0020,1206)	O
Number of Study Related Instances	(0020,1208)	O
Interpretation Author	(4008,010C)	O

The following conventions are used to defined they of keys used in Query/Retrieve Information Models. Please refer to DICOM Standard part 4 for details on what Unique, Optional and Required attribute means.

Symbol	Description
U	Unique Key Attribute
O	Optional Key Attribute
R	Required Key Attribute

**TABLE SECTION 13.4-3  
Q/R STUDY LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES**

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = STUDY

**TABLE SECTION 13.4-4  
Q/R SPECIFIC CHARACTER SET ATTRIBUTES**

Attribute Name	Tag	Type	Note
Specific Character Set	(0008,0005)	-	Set to ISO IR 100 or ISO 2022 IR 87 if extended characters are used in query. ISO IR 100 or ISO 2022 IR 87 is supported in responses.

### 13.4.2 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 SECTION 11.4-5  
SERIES LEVEL ATTRIBUTES FOR THE STUDY ROOT  
QUERY/RETRIEVE INFORMATION MODEL

Attribute Name	Tag	Type
Modality	(0008,0060)	R
Series Number	(0020,0011)	R
Series Instance UID	(0020,000E)	U
Number of Series Related Instances	(0020,1209)	O
Series Date	(0008,0021)	O
Series Time	(0008,0031)	O
Performing Physicians' Name	(0008,1050)	O
Protocol Name	(0018,1030)	O
Series Description	(0008,103E)	O

Operator's Name	(0008,1070)	O
Institutional Department Name	(0008,1040)	O
Software Versions	(0018,1020)	O
Performed Procedure Step Start Date	(0040,0244)	O
Performed Procedure Step Start Time	(0040,0245)	O

**TABLE SECTION 13.4-6  
Q/R SERIES LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES**

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = SERIES

**TABLE SECTION 13.4-7  
Q/R SPECIFIC CHARACTER SET ATTRIBUTES**

Attribute Name	Tag	Type	Note
Specific Character Set	(0008,0005)	-	Set to ISO IR 100 or ISO 2022 IR 87 if extended characters are used in query. ISO IR 100 or ISO 2022 IR 87 is supported in responses.

### 13.4.3 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 SECTION 13.4-8  
IMAGE LEVEL ATTRIBUTES FOR THE STUDY ROOT  
QUERY/RETRIEVE INFORMATION MODEL**

Attribute Name	Tag	Type
Instance Number	(0020,0013)	R
SOP Instance UID	(0008,0018)	U
Contrast/Bolus Agent	(0018,0010)	O

**TABLE SECTION 13.4-9  
Q/R IMAGE LEVEL AND LOCATION FOR RETRIEVE ATTRIBUTES**

Attribute Name	Tag	Type	Note
Query Retrieve Level	(0008,0052)	-	Value = IMAGE

**TABLE SECTION 13.4-10  
Q/R SPECIFIC CHARACTER SET ATTRIBUTES**

Attribute Name	Tag	Type	Note
Specific Character Set	(0008,0005)	-	Set to ISO IR 100 or ISO 2022 IR 87 if extended characters are used in query. ISO IR 100 or ISO 2022 IR 87 is supported in responses.

### 13.5 PRIVATE DATA DICTIONARY

No private data dictionary is defined.