GE Healthcare

Technical Publications

Direction DOC1522334
Revision 1

Venue 50 Version 4.X.X
DICOM CONFORMANCE STATEMENT

GE Healthcare

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CONFORMANCE STATEMENT OVERVIEW

The Venue 50 is a self-contained networked computer system used for acquiring ultrasound diagnostic medical images. The system implements the necessary DICOM services to download worklist from an information system or save Secondary Capture images and Ultrasound Multi-frame images to a network storage device. The system conforms to the DICOM standard to allow the sharing of medical information with other digital imaging systems.

Table 0.1 provides an overview of the network services supported by Venue 50.

Table 0.1 – NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Secondary Capture Image Storage	Yes / Option*	No
Ultrasound multiframe Image Storage	Yes / Option*	No
Verification	Yes / Option*	No
Workflow Management		
Modality Worklist Information Model – FIND SOP Class	Yes / Option*	No

Option*: This means that this service can be purchased separately. All DICOM options are enabled through purchase of the single DICOM option for Venue 50.

TABLE OF CONTENTS

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 GEHC equipment compliance to the DICOM requirements for the implementation of Networking features.

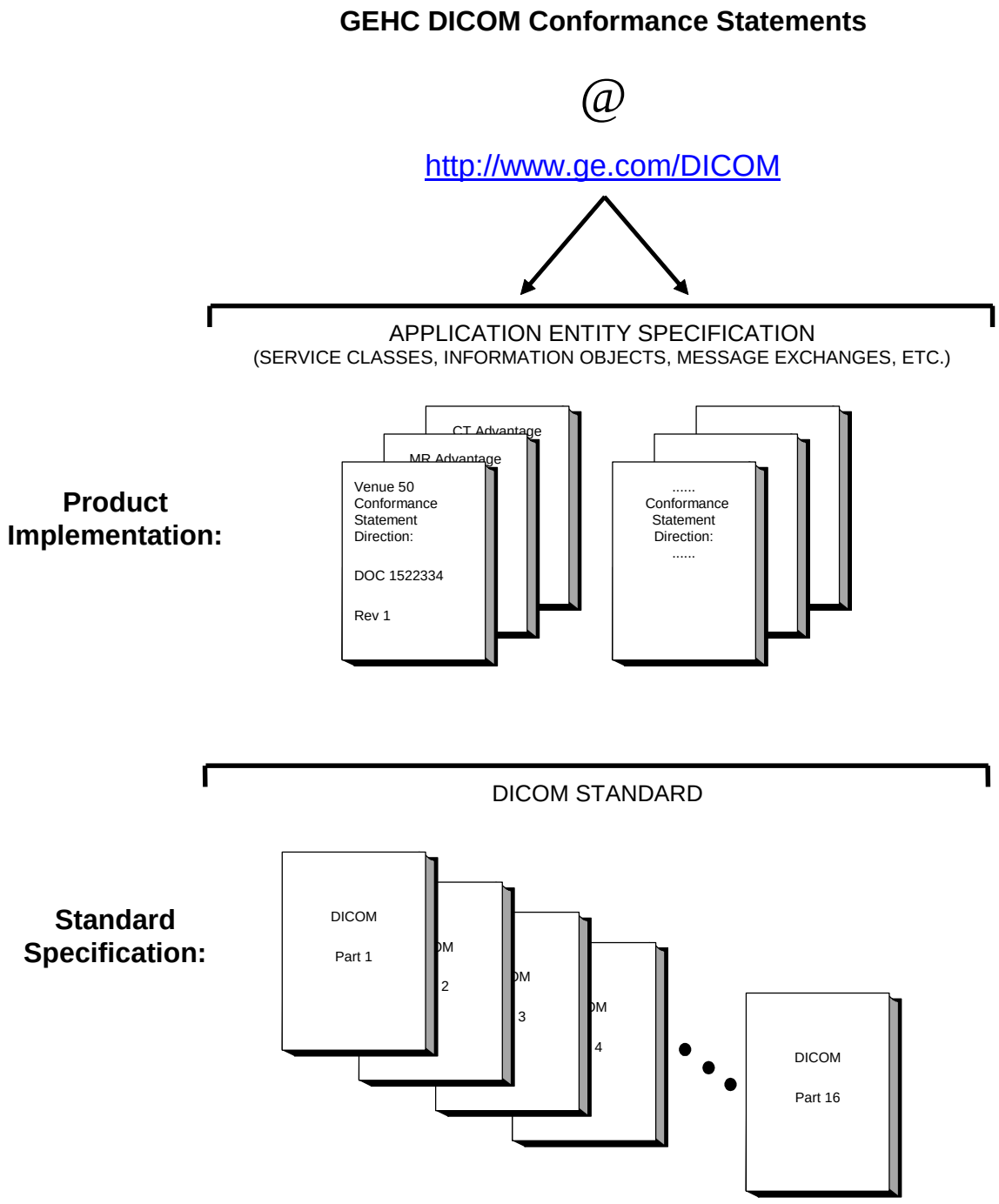
Section 3 (Secondary Capture Information Object Conformance Statement), which specifies the GEHC equipment compliance to the DICOM requirements for the implementation of Secondary Capture features.

Section 4 (Ultrasound multiframe Information Object Conformance Statement), which specifies the GEHC equipment compliance to the DICOM requirements for the implementation of Ultrasound multiframe features.

Section 4 (Modality Worklist Information Model), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of the Modality Worklist service.

1.2 OVERALL DICOM CONFORMANCE STATEMENT DOCUMENT STRUCTURE

The Documentation Structure of the GEHC DICOM Conformance Statements is shown in the Illustration below.



This document specifies the DICOM implementation. It is entitled:

VENUE 50 Version 4.X.X
Conformance Statement for DICOM
Direction ***DOC1522334***

This DICOM Conformance Statement documents the DICOM Conformance Statement and Technical Specification required to interoperate with the GEHC network interface.

The GEHC 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 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. 17th Street, Suite 1752
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 Standard and with the terminology and concepts which are used in that Standard.

1.4 SCOPE AND FIELD OF APPLICATION

It is the intent of this document to provide an unambiguous specification for GEHC implementations. This specification, called a Conformance Statement, includes a DICOM Conformance Statement and is necessary to ensure proper processing and interpretation of GEHC medical data exchanged using DICOM. The GEHC Conformance Statements are available to the public.

The reader of this DICOM Conformance Statement should be aware that different GEHC devices are capable of using different Information Object Definitions. For example, a GEHC 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 GEHC implementation. If the user encounters unspecified private data elements while parsing a GEHC 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 GEHC 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 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 Standard. DICOM will incorporate new features and technologies and GE may follow the evolution of the Standard. The GEHC 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) described 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

NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at http://medical.nema.org/

1.7 DEFINITIONS

Informal definitions are provided for the following terms used in this Conformance Statement. The DICOM Standard is the authoritative source for formal definitions of these terms.

Abstract Syntax – the information agreed to be exchanged between applications, generally equivalent to a Service/Object Pair (SOP) Class. Examples : Verification SOP Class, Modality Worklist Information Model Find SOP Class, Computed Radiography Image Storage SOP Class.

Application Entity (AE) – an end point of a DICOM information exchange, including the DICOM network or media interface software; i.e., the software that sends or receives DICOM information objects or messages. A single device may have multiple Application Entities.

Application Entity Title – the externally known name of an *Application Entity*, used to identify a DICOM application to other DICOM applications on the network.

Application Context – the specification of the type of communication used between *Application Entities*. Example: DICOM network protocol.

Association – a network communication channel set up between *Application Entities*.

Attribute – – a unit of information in an object definition; a data element identified by a *tag*. The information may be a complex data structure (Sequence), itself composed of lower level data elements. Examples: Patient ID (0010,0020), Accession Number (0008,0050), Photometric Interpretation (0028,0004), Procedure Code Sequence (0008,1032).

Information Object Definition (IOD) – the specified set of *Attributes* that comprise a type of data object; does not represent a specific instance of the data object, but rather a class of similar data objects that have the same properties. The *Attributes* may be specified as Mandatory (Type 1), Required but possibly unknown (Type 2), or Optional (Type 3), and there may be conditions associated with the use of an Attribute (Types 1C and 2C). Examples: MR Image IOD, CT Image IOD, Print Job IOD.

Joint Photographic Experts Group (JPEG) – a set of standardized image compression techniques, available for use by DICOM applications.

Media Application Profile – the specification of DICOM information objects and encoding exchanged on removable media (e.g., CDs)

Module – a set of *Attributes* within an *Information Object Definition* that are logically related to each other. Example: Patient Module includes Patient Name, Patient ID, Patient Birth Date, and Patient Sex.

Negotiation – first phase of *Association* establishment that allows *Application Entities* to agree on the types of data to be exchanged and how that data will be encoded.

Presentation Context – the set of DICOM network services used over an *Association*, as negotiated between *Application Entities*; includes *Abstract Syntaxes* and *Transfer Syntaxes*.

Protocol Data Unit (PDU) – a packet (piece) of a DICOM message sent across the network. Devices must specify the maximum size packet they can receive for DICOM messages.

Security Profile – a set of mechanisms, such as encryption, user authentication, or digital signatures, used by an *Application Entity* to ensure confidentiality, integrity, and/or availability of exchanged DICOM data

Service Class Provider (SCP) – role of an *Application Entity* that provides a DICOM network service; typically, a server that performs operations requested by another *Application Entity* (*Service Class User*). Examples: Picture Archiving and Communication System (image storage SCP, and image query/retrieve SCP), Radiology Information System (modality worklist SCP).

Service Class User (SCU) – role of an *Application Entity* that uses a DICOM network service; typically, a client. Examples: imaging modality (image storage SCU, and modality worklist SCU), imaging workstation (image query/retrieve SCU)

Service/Object Pair (SOP) Class – the specification of the network or media transfer (service) of a particular type of data (object); the fundamental unit of DICOM interoperability specification. Examples: Ultrasound Image Storage Service, Basic Grayscale Print Management.

Service/Object Pair (SOP) Instance – an information object; a specific occurrence of information exchanged in a *SOP Class*. Examples: a specific x-ray image.

Tag – a 32-bit identifier for a data element, represented as a pair of four digit hexadecimal numbers, the "group" and the "element". If the "group" number is odd, the tag is for a private (manufacturer-specific) data element. Examples: (0010,0020) [Patient ID], (07FE,0010) [Pixel Data], (0019,0210) [private data element]

Transfer Syntax – the encoding used for exchange of DICOM information objects and messages. Examples: *JPEG* compressed (images), little endian explicit value representation.

Unique Identifier (UID) – a globally unique "dotted decimal" string that identifies a specific object or a class of objects; an ISO-8824 Object Identifier. Examples: Study Instance UID, SOP Class UID, SOP Instance UID.

Value Representation (VR) – the format type of an individual DICOM data element, such as text, an integer, a person's name, or a code. DICOM information objects can be transmitted with either explicit identification of the type of each data element (Explicit VR), or without explicit identification (Implicit VR); with Implicit VR, the receiving application must use a DICOM data dictionary to look up the format of each data element.

1.8 SYMBOLS AND ABBREVIATIONS

AE	Application Entity
AET	Application Entity Title
DICOM	Digital Imaging and Communications in Medicine
IOD	Information Object Definition
IPv4	Internet Protocol version 4
MWL	Modality Worklist
SC	Secondary Capture
SCP	Service Class Provider
SCU	Service Class User
SOP	Service-Object Pair
TCP/IP	Transmission Control Protocol/Internet Protocol

2. NETWORK CONFORMANCE STATEMENT

2.1 INTRODUCTION

This section of the DICOM Conformance Statement specifies the VENUE 50 compliance to DICOM requirements for **Networking** features.

VENUE 50 are Ultrasound scanners running on embedded Linux. It allows for the following DICOM functionality:

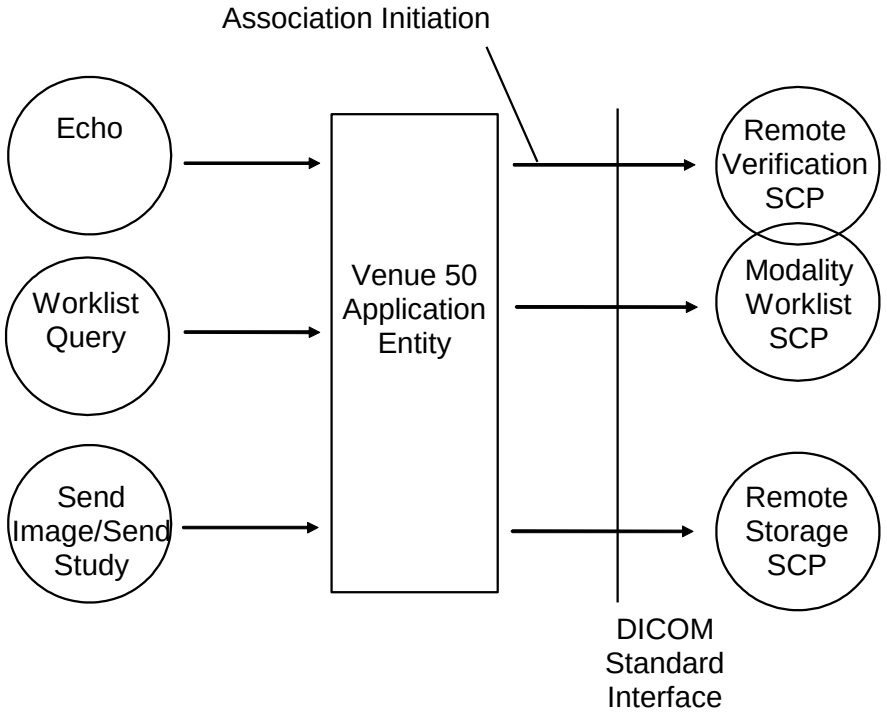
- Sending Verification Echo messages to DICOM SCP.
- Convert JPG images to DICOM Secondary Capture and transfer them to a DICOM SCP over a JPEGProcess1 transfer syntax.
- Sending Ultrasound Multi-frame Images to a DICOM SCP over a RLELossless transfer syntax.
- Querying and transferring DICOM Modality Worklist from a Worklist SCP.

2.2 IMPLEMENTATION MODEL

2.2.1 Application Data Flow Diagram

The network application model for the VENUE 50 is shown in the following Illustration :

ILLUSTRATION 2–1
VENUE 50 NETWORK APPLICATION MODEL AND DATA FLOW DIAGRAM



There are three real-world activities that occur on the VENUE 50 – Exam Save, Worklist Query, and Echo.

Exam save initiates a connection with the DICOM SCP and transmits secondary capture images (still images) or ultrasound multiframe images to the DICOM SCP.

Worklist Query initiates a connection with the DICOM SCP, performs a query and retrieves the matching entries to the product.

Echo initiates a connection to a DICOM SCP, posts a Verification request and closes the connection.

2.2.2 Functional Definition of AE's

Application Entity VENUE 50 supports the following functions.

- Initiates a DICOM connection to send secondary capture images (still images)
- Initiates a DICOM connection to send ultrasound multi-frame images
- Initiates a DICOM Verification to assist in network diagnostics
- Initiates a DICOM worklist query to receive worklist information.

2.2.3 Sequencing of Real-World Activities

Not applicable

2.3 AE SPECIFICATIONS

2.3.1 Venue 50 AE Specification

The VENUE 50 Application Entity provides Standard Conformance to the following DICOM SOP Classes as an **SCU** and/or as an **SCP**:

SOP Class Name	SOP Class UID	SCU	SCP
Verification SOP Class	1.2.840.10008.1.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	Yes	No

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 receive size for the VENUE 50 is:

Maximum Length PDU	**16384 – Not Configurable**

2.3.1.1.2 Number of Associations

The VENUE 50 does not accept DICOM associations. The Venue 50 will make a single outbound DICOM association.

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:

VENUE 50 Implementation UID	**1.2.840.113619.6.387**
VENUE 50 Implementation Version Name	**VENUE50**

2.3.1.2 Association Initiation Policy

When the VENUE 50 Application Entity initiates an Association for any Real-World Activity, it will propose the Presentation Contexts for all Real-World Activities; i.e., there is only a single, comprehensive Presentation Context Negotiation proposed for the AE.

The VENUE 50 proposes only a single Transfer Syntax in each Presentation Context; i.e., for each Abstract Syntax in the following Presentation Context Tables, the AE proposes one Presentation Context for each specified Transfer Syntax.

2.3.1.2.1 Real-World Activity A ('Exam Save' Operation)

2.3.1.2.1.1 Associated Real-World Activity

Upon manual request of the operator, images will be sent to a DICOM Storage SCP.

2.3.1.2.1.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by AE Venue 50 for Activity Exam save					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Baseline Lossy 8-Bit	1.2.840.10008.1.2.4.50	SCU	None
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1	RLELossless Implicit VR Little Endian (see the Note below)	1.2.840.10008.1.2.5 1.2.840.10008.1.2	SCU	None

NOTE: Note: For Multiframe ultrasound image, the application offers both the RLE and Little Endian Implicit VR Transfer Syntaxes; however, in certain situations, transfer using the Implicit VR Little Endian syntax may fail due to constrained application resources. It is strongly recommended that the SCP accept transfers using the RLE syntax.

2.3.1.2.1.2.1 SOP Specific DICOM Conformance Statement for All Storage SOP Classes

Following are the status codes that are more specifically processed when receiving messages from a **Storage** SCP equipment :

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Failure	A700-A7FF	Refused: Out of resources	Item remains in spooler with status of "Failed"
	A900-A9FF	Error: Data Set does not match SOP Class	Item remains in spooler with status of "Failed"
	C000-CFFF	Error: Cannot Understand	Item remains in spooler with status of "Failed"
	0122	SOP Class Not Supported	Item remains in spooler with status of "Failed"
Warning	B000	Coercion of Data Elements	Processing completes. Spooler Job is completed and removed from the spooler.
	B006	Elements Discarded	Processing completes. Spooler Job is completed and removed from the spooler.

	B007	Data Set does not match SOP Class	Processing completes. Spooler Job is completed and removed from the spooler.
Success	0000		Item is removed from the spooler
*	*	Any other status code.	Item remains in spooler with status of "Failed"

2.3.1.2.2 Real-World Activity B ('Echo' Operation)

The operator may initiate a DICOM Verification Request in the DICOM tab of the Connectivity tab in Utility. Associations are released upon receipt of each C-ECHO confirmation.

2.3.1.2.2.1 Associated Real-World Activity

Upon manual request of the operator, a DICOM Verification Request is sent to a configured destination.

2.3.1.2.2.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by AE Venue 50 for Activity Exam save					
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	SCU	None

2.3.1.2.3 Real-World Activity C ('Worklist Query' Operation)

The operator may initiate a DICOM Worklist Query by pressing the "Worklist" button on the main patient page of the application.

2.3.1.2.3.1 Associated Real-World Activity

Upon manual request of the operator, the system will initiate a DICOM Worklist Query which will send a C-FIND-RQ to the Worklist SCP. Associations will be released upon the receipt of C-FIND-RSP confirmation.

2.3.1.2.3.2 Proposed Presentation Context Table

Presentation Context Table – Proposed by AE Venue 50 for Activity Exam save					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		

Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	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	SCU	None

2.3.1.2.3.2.1 SOP Specific DICOM Conformance Statement for the Modality Worklist Information Model - FIND SOP Class

The VENUE 50 provides matching against Modality Worklist query keys as described in Section 4

The AE does not support case-insensitive matching for the attributes of Value Representation PN as described in Section 4.

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

Service Status	Status Code	Further Meaning	Application Behavior When Receiving Status Code
Refused	A700	Out of Resources	Terminate the association and operation
	0122	SOP Class not Supported	Terminate the association and operation
Failed	A900	Identifier does not match SOP Class	Terminate the association and operation
	Cxxx	Unable to process	Terminate the association and operation
Success	0000	Matching is complete - No final identifier is supplied	Results are displayed
Pending	FF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	Receiving process of the matching continues.
	FF01	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier	Receiving process of the matching continues without any warnings or errors.

2.3.1.2.3.3 Transfer Syntax Selection Policies

Within the Modality Worklist Model, the Venue 50 will accept the first proposed transfer syntax that it also supports for that Abstract Syntax.

1. Implicit VR Little Endian
2. Explicit VR Little Endian
3. Explicit VR Big Endian

2.4 COMMUNICATION PROFILES

2.4.1 Supported Communication Stacks

The DICOM Upper Layer Protocol is supported using TCP/IP, as specified in DICOM PS3.8.

The TCP/IP stack is inherited from the embedded Linux Operating System.

2.4.2 Physical Media Support

The product is provided with a **wired** 10/100 Mb/s auto-sensing Ethernet interface. Optional wireless network interfaces are also available.

Note: For more information about the Physical Media available on Venue 50, please refer to the Product Data Sheet.

2.4.3 Additional Protocol Support

The wired networking interface supports both DHCP and static IP Addressing. The optional wireless interface only supports DHCP.

Note: For more information about the Physical Media available on LOGIQ E, please refer to the Product Data Sheet.

2.4.4 IPv4 and IPv6 Support

The product supports only IPV4. There is no support for IPV6.

2.5 EXTENSIONS / SPECIALIZATIONS/ PRIVATIZATIONS

2.5.1 Standard Extended / Specialized / Private SOP Classes

2.5.2 Private Transfer Syntaxes

No Private Transfer Syntax is supported.

2.6 CONFIGURATION

2.6.1 AE Title/Presentation Address Mapping

2.6.2 Configurable Parameters

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

- Local AE Title
- Local IP Address *Only for the wired interface.
- Local IP Netmask *Only for the wired interface.
- Local IP Gateway *Only for the wired interface.

The following fields are configurable for every remote DICOM AE:

- Remote AE Title
- Remote IP Address
- Listening TCP/IP Port Number

The following fields are configurable:

2.7 SUPPORT OF EXTENDED CHARACTER SETS

The Venue 50 is configurable with the default ISO_IR 100 (Latin alphabet Number 1 supplementary set), as extended character set. Any incoming SOP instance that is encoded using another extended character set will not be displayed.

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2.8 CODES AND CONTROLLED TERMINOLOGY

2.8.1 Fixed Coded Terminology

Not applicable.

2.9 SECURITY PROFILES

The product does not conform to any defined DICOM Security Profiles.

It is assumed that the product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

1. Firewall or router protections to ensure that only approved external hosts have network access to the product.
2. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

3. Any communications with external hosts and services outside the locally secured environment use appropriate secure network channels (such as a Virtual Private Network (VPN)

The product conforms to the basic TLS secure transport connection profile, optional.

If the TLS option is enabled, it only supports secure TLS connection without a certificate private key password, and without verifying the peer certificate.

3. SECONDARY CAPTURE INFORMATION OBJECT IMPLEMENTATION

3.1 INTRODUCTION

This section specifies the use of the DICOM SC Image IOD to represent the information included in SC Images produced by this implementation. Corresponding attributes are conveyed using the module construct.

3.2 VENUE 50 MAPPING OF DICOM ENTITIES

The Venue 50 maps DICOM Information Entities to local Information Entities in the product's database and user interface.

TABLE 3-1
MAPPING OF DICOM ENTITIES TO VENUE 50 ENTITIES

DICOM IE	Venue 50 Entity
Patient	Patient
Study	Exam
Series	Series
Image	Image

3.3 IOD MODULE TABLE

The Secondary Capture Information Object Definition comprises the modules of the following table, plus Standard Extended and Private attributes. Standard Extended and Private attributes are described in Section 3.4.

TABLE 3-2
SC IMAGE IOD MODULES

Entity Name	Module Name	Usage	Reference
Patient	Patient	Used	3.4.1.1
	Clinical Trial Subject	NA	NA
Study	General Study	Used	3.4.2.1
	Patient Study	NA	NA
	Clinical Trial Study	NA	NA
Series	General Series	Used	3.4.3.1
	Clinical Trial Series	NA	NA
Equipment	General Equipment	Used	3.4.4.1
	SC Equipment	Used	3.4.4.2
Image	General Image	Used	3.4.5.1
	Image Pixel	Used	3.4.5.2
	Device	Not Used	NA
	SC Image	Used	3.4.5.4
	Overlay Plane	Not Used	NA
	Modality LUT	Not used	NA
	VOI LUT	Not Used	NA
	SOP Common	Used	3.4.5.4

3.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the SC Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported and expected. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained from when generating the instance as well as what are the expected values when loading such instance. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions). Also note that Attributes not present in tables are not supported.

3.4.1 Patient Entity Modules

3.4.1.1 Patient Module

TABLE 3-3
PATIENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Entered through the UI or taken from Worklist
Patient ID	(0010,0020)	2	Entered through the UI or taken from Worklist
Issuer of Patient ID	(0010,0021)	3	Taken from Worklist
Patient's Birth Date	(0010,0030)	2	Taken from Worklist
Patient's Sex	(0010,0040)	2	Taken from Worklist
Referenced Patient Sequence	(0008,1120)	3	Taken from Worklist
Patient's Birth Time	(0010,0032)	3	Not Used
Other Patient IDs	(0010,1000)	3	Entered through the UI, or taken from Worklist, or entered through the UI, or combined with emergency ID
Other Patient IDs Sequence	(0010,1002)	3	Taken from Worklist
>Patient ID	(0010,0020)	1	Taken from Worklist
>Issuer of Patient ID	(0010,0021)	1	Taken from Worklist
>Type of Patient ID	(0010,0022)	1	Taken from Worklist

3.4.2 Study Entity Modules

3.4.2.1 General Study Module

TABLE 3-4
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribue Description
Study Instance UID	(0020,000D)	1	Taken from Worklist or generated for exams not queried from a Worklist.
Study Date	(0008,0020)	2	Taken from study creation date
Study Time	(0008,0030)	2	Taken from study creation time
Referring Physician's Name	(0008,0090)	2	Taken from Worklist
Referring Physician Identification Sequence	(0008,0096)	3	NA
Study ID	(0020,0010)	2	Taken from tag worklist tag (0040,1001), or sent empty for exam not queried from worklist.
Accession Number	(0008,0050)	2	Taken from Worklist
Referenced Study Sequence	(0008,1110)	3	Taken from Worklist

3.4.3 Series Entity Modules

3.4.3.1 General Series Module

TABLE 3-5
GENERAL SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Taken from Worklist or set to US
Series Instance UID	(0020,000E)	1	Generated internally
Series Number	(0020,0011)	2	This is sent empty.
Laterality	(0020,0060)	2C	NA
Series Date	(0008,0021)	3	Taken from series creation date
Series Time	(0008,0031)	3	Taken from series creation time
Request Attributes Sequence	(0040,0275)	3	Taken from Worklist
>Requested Procedure ID	(0040,1001)	1C	Taken from Worklist
>Scheduled Procedure Step ID	(0040,0009)	1C	Taken from Worklist
>Scheduled Procedure Step Description	(0040,0007)	3	Taken from Worklist

3.4.4 Equipment Entity Modules

3.4.4.1 General Equipment Module

TABLE 3-6
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	Set to “GE Healthcare”
Institution Name	(0008,0080)	3	Taken from “Facility Name” in Configuration
Station Name	(0008,1010)	3	Taken from Local AE Title in Configuration
Manufacturer's Model Name	(0008,1090)	3	Set to “Venue 50”
Software Versions	(0018,1020)	3	Read from the SW Version

3.4.4.2 SC Equipment Module

TABLE 3-7
SC EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Use
Conversion Type	(0008,0064)	1	WSD = Workstation
Modality	(0008,0060)	3	US or taken from Worklist

3.4.5 Image Entity Modules

3.4.5.1 General Image Module

TABLE 3-8
GENERAL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Generated as images are acquired
Patient Orientation	(0020,0020)	2C	See 3.4.5.1.1
Content Date	(0008,0023)	2C	Generated from file date
Content Time	(0008,0033)	2C	Generated from file time
Image Type	(0008,0008)	3	See 3.4.5.1.2
Lossy Image Compression	(0028,2110)	3	Always set to 01

3.4.5.1.1 Patient Orientation

This tag is always sent empty.

3.4.5.1.2 Image Type

The Venue 50 sets the values of Image Type (0008,0008) to be ORIGINAL\PRIMARY.

3.4.5.1.3 Derivation Description and Source Image Sequence

Derivation Description (0008,2111) is not used.

3.4.5.1.4 Lossy Image Compression

Lossy Image Compression (0028,2110) is always set to 01.

3.4.5.1.5 Icon Image Key Definition

Not supported.

3.4.5.2 Image Pixel Module

TABLE 3-9
IMAGE PIXEL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	Always set to 3
Photometric Interpretation	(0028,0004)	1	Always YBR_FULL_422
Rows	(0028,0010)	1	655
Columns	(0028,0011)	1	600
Bits Allocated	(0028,0100)	1	8
Bits Stored	(0028,0101)	1	8
High Bit	(0028,0102)	1	7.

Pixel Representation	(0028,0103)	1	0
Pixel Data	(7FE0,0010)	1	
Planar Configuration	(0028,0006)	1C	0

3.4.5.3 SC Image Module

TABLE 3-10
SC IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Use
Date of Secondary Capture	(0018,1012)	3	Not send
Time of Secondary Capture	(0018,1014)	3	Not send
Nominal Scanned Pixel Spacing	(0018,2010)	3	Not send
Document Class Code Sequence	(0040,E008)	3	Not send
Pixel Spacing	(0028,0030)	1C	Not send
Pixel Spacing Calibration Type	(0028,0A02)	3	Not send
Pixel Spacing Calibration Description	(0028,0A04)	1C	Not send
View Code Sequence	(0054,0220)	3	Not send
Slice Progression Direction	(0054,0500)	3	Not send

3.4.5.4 SOP Common Module

TABLE 3-1
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.7
SOP Instance UID	(0008,0018)	1	Generated when JPG is converted to DCM
Specific Character Set	(0008,0005)	1C	ISO_IR 100 = Latin Alphabet No. 1
Instance Number	(0020,0013)	3	Based on order the images are acquired.

4. ULTRASOUND MULTIFRAME (US MF) INFORMATION OBJECT IMPLEMENTATION

4.1 INTRODUCTION

This section specifies the use of the DICOM US Multi-frame Image IOD to represent the information included in US images produced by this implementation. Corresponding attributes are conveyed using the module construct.

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities contained within the US Multi-Frame Information Object.

4.2 VENUE 50 MAPPING OF DICOM ENTITIES

The Ultrasound multiframe Information Object Definition comprises the modules of the following table, plus Standard Extended and Private attributes.

TABLE 4-1
MAPPING OF DICOM ENTITIES TO VENUE 50 ENTITIES

DICOM	VENUE 50 Entity
Patient	Patient
Study	Exam
Series	Series
Image	Image

4.3 IOD MODULE TABLE

Within an entity of the DICOM US Multi-Frame IOD, 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 4-2 identifies the defined modules within the entities, which comprise the DICOM US Multi-Frame IOD. Modules are identified by Module Name.

See DICOM Part 3 for a complete definition of the entities, modules, and attributes.

TABLE 4-2
US MULTI-FRAME IOD MODULES

Entity Name	Module Name	Usage	Reference
Patient	Patient	Used	3.4.1.1
	Clinical Trial Subject	NA	NA
Study	General Study	Used	3.4.2.1
	Patient Study	NA	NA
	Clinical Trial Study	NA	NA
Series	General Series	Used	3.4.3.1
	Clinical Trial Series	NA	NA
Frame of Reference	Frame of Reference	NA	NA
	Synchronization	NA	NA
Equipment	General Equipment	Used	3.4.4.1
Image	General Image	Used	4.4.1.1
	Image Pixel	Used	4.4.1.2
	Contrast/Bolus	NA	NA
	Cine	Used	4.4.1.3
	Multi-frame	Used	4.4.1.4
	Palette Color Lookup Table	NA	NA
	US Region Calibration	NA	NA
	US Image	Used	4.4.1.5
	VOI LUT	NA	NA
	SOP Common	Used	4.4.2.1
Curve		NA	NA

4.4 INFORMATION MODULE DEFINITIONS

Please refer to DICOM Standard Part 3 (Information Object Definitions) for a description of each of the entities and modules contained within the US Multi-Frame Information Object.

The following modules are included to convey Enumerated Values, Defined Terms, and Optional Attributes supported. Type 1 & Type 2 Attributes are also included for completeness and to define what values they may take and where these values are obtained. It should be noted that they are the same ones as defined in the DICOM Standard Part 3 (Information Object Definitions).

4.4.1 Common Image Modules

The following Image IE Modules are common to all Composite Image IODs which reference the Image IE.

4.4.1.1 General Image Module

This section specifies the attributes that identify and describe an image within a particular series.

TABLE 4-3
GENERAL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Generated as images are acquired
Patient Orientation	(0020,0020)	2C	Sent with empty value.
Content Date	(0008,0023)	2C	Set from Image date
Content Time	(0008,0033)	2C	Set from Image time
Image Type	(0008,0008)	3	Set to “ORIGINAL\PRIMARY”
Acquisition Number	(0020,0012)	3	Not used
Acquisition Date	(0008,0022)	3	Not used
Acquisition Time	(0008,0032)	3	Not used
Referenced Image Sequence	(0008,1140)	3	Not used
>Referenced SOP Class UID	(0008,1150)	1C	Not used
>Referenced SOP Instance UID	(0008,1155)	1C	Not used
>Referenced Frame Number	(0008,1160)	3	Not used
Derivation Description	(0008,2111)	3	Not used
Source Image Sequence	(0008,2112)	3	Not used
>Referenced SOP Class UID	(0008,1150)	1C	Not used
>Referenced SOP Instance UID	(0008,1155)	1C	Not used
>Referenced Frame Number	(0008,1160)	3	Not used
Images in Acquisition	(0020,1002)	3	Not used
Image Comments	(0020,4000)	3	Not used
Quality Control Image	(0028,0300)	3	Not used
Burned In Annotation	(0028,0301)	3	Not used
Lossy Image Compression	(0028,2110)	3	Not used
Lossy Image Compression Ratio	(0028,2112)	3	Not used

4.4.1.2 Image Pixel Module

This section specified the attributes that describe the pixel data of the image.

TABLE 4-4
IMAGE PIXEL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	Set to”3”
Photometric Interpretation	(0028,0004)	1	Set to “RGB”
Rows	(0028,0010)	1	Value depends on scanning mode and configuration setup
Columns	(0028,0011)	1	Value depends on scanning mode and configuration setup.

Attribute Name	Tag	Type	Attribute Description
Bits Allocated	(0028,0100)	1	Value always = 0008H.
Bits Stored	(0028,0101)	1	Value always = 0008H.
High Bit	(0028,0102)	1	Value always = 0007H.
Pixel Representation	(0028,0103)	1	Value always = 0000H , unsigned integer.
Pixel Data	(7FE0,0010)	1	Pixel Data of image.
Planar Configuration	(0028,0006)	1C	Value always = 0001H, color-by-plane
Pixel Aspect Ratio	(0028,0034)	1C	Not used
Smallest Image Pixel Value	(0028,0106)	3	Not used
Largest Image Pixel Value	(0028,0107)	3	Not used
Red Palette Color Lookup Table Descriptor	(0028,1101)	1C	Not used
Green Palette Color Lookup Table Descriptor	(0028,1102)	1C	Not used.
Blue Palette Color Lookup Table Descriptor	(0028,1103)	1C	Not used
Red Palette Color Lookup Table Data	(0028,1201)	1C	Not used
Green Palette Color Lookup Table Data	(0028,1202)	1C	Not used
Blue Palette Color Lookup Table Data	(0028,1203)	1C	Not used.

4.4.1.3 Cine Module

TABLE 4-5
CINE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Frame Time	(0018,1063)	1C	Set to the interframe time
Frame Time Vector	(0018,1065)	1C	Not used
Start Trim	(0008,2142)	3	Not used
Stop Trim	(0008,2143)	3	Not used
Recommended Display Frame Rate	(0008,2144)	3	Not used
Cine Rate	(0018,0040)	3	Not used
Frame Delay	(0018,1066)	3	Not used
Effective Duration	(0018,0072)	3	Not used
Actual Frame Duration	(0018,1242)	3	Not used
Preferred Playback Sequencing	(0018,1244)	3	Not used

4.4.1.4 Multi-frame Module

TABLE 4-6
MULTI-FRAME MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Number of Frames	(0028,0008)	1	Set to the number of frames in image
Frame Increment Pointer	(0028,0009)	1	Set to Frame Time (0018,1063)

4.4.1.5 US Image Module

This section specifies the attributes that describe ultrasound images.

TABLE 4-7
US IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples Per Pixel	(0028,0002)	1	Set to"3"
Photometric Interpretation	(0028,0004)	1	Set to "RGB"
Bits Allocated	(0028,0100)	1	Value depends on scanning mode and configuration setup
Bits Stored	(0028,0101)	1	Value depends on scanning mode and configuration setup.
High Bit	(0028,0102)	1	Value always = 0008H.
Planar Configuration	(0028,0006)	1	Value always = 0008H.
Pixel Representation	(0028,0103)	1	Value always = 0007H.
Frame Increment Pointer	(0028,0009)	1C	Set to Frame Time (0018,1063)
Image Type	(0008,0008)	2	Set to "ORIGINAL\PRIMARY"
Lossy Image Compression	(0028,2110)	1C	Not used
Number of Stages	(0008,2124)	2C	Not used
Number of Views in Stage	(0008,212A)	2C	Not used.
Ultrasound Color Data Present	(0028,0014)	3	Not used
Referenced Overlay Sequence	(0008,1130)	3	Not used
>Referenced SOP Class UID	(0008,1150)	1C	Not used
>Referenced SOP Instance UID	(0008,1155)	1C	Not used
Referenced Curve Sequence	(0008,1145)	3	Not used
>Referenced SOP Class UID	(0008,1150)	1C	Not used
>Referenced SOP Instance UID	(0008,1155)	1C	Not used
Stage Name	(0008,2120)	3	Not used
Stage Number	(0008,2122)	3	Not used
View Name	(0008,2127)	3	Not used
View Number	(0008,2128)	3	Not used
Number of Event Timers	(0008,2129)	3	Not used
Event Elapsed Time(s)	(0008,2130)	3	Not used
Event Timer Name(s)	(0008,2132)	3	Not used

Attribute Name	Tag	Type	Attribute Description
Anatomic Region Sequence	(0008,2218)	3	Not used
>Include 'Code Sequence Macro'			
>Anatomic Region Modifier Sequence	(0008,2220)	3	Not used
>>Include 'Code Sequence Macro'			
Primary Anatomic Structure Sequence	(0008,2228)	3	Not used
>Include 'Code Sequence Macro'			
>Primary Anatomic Structure Modifier Sequence	(0008,2230)	3	Not used
>>Include 'Code Sequence Macro'			
Transducer Position Sequence	(0008,2240)	3	Not used
>Include 'Code Sequence Macro'			
>Transducer Position Modifier Sequence	(0008,2242)	3	Not used
>>Include 'Code Sequence Macro'			
Transducer Orientation Sequence	(0008,2244)	3	Not used
>Include 'Code Sequence Macro'			
>Transducer Orientation Modifier Sequence	(0008,2246)	3	Not used
>>Include 'Code Sequence Macro'			
Trigger Time	(0018,1060)	3	Not used
Nominal Interval	(0018,1062)	3	Not used
Beat Rejection Flag	(0018,1080)	3	Not used
Low R-R Value	(0018,1081)	3	Not used
High R-R Value	(0018,1082)	3	Not used
Heart Rate	(0018,1088)	3	Set to heart rate
Output Power	(0018,5000)	3	Not used
Transducer Data	(0018,5010)	3	Not used
Transducer Type	(0018,6031)	3	Not used
Focus Depth	(0018,5012)	3	Not used
Preprocessing Function	(0018,5020)	3	Not used
Mechanical Index	(0018,5022)	3	Not used
Bone Thermal Index,	(0018,5024)	3	Not used
Cranial Thermal Index	(0018,5026)	3	Not used
Soft Tissue Thermal Index	(0018,5027)	3	Not used
Soft Tissue-focus Thermal Index	(0018,5028)	3	Not used
Soft Tissue-surface Thermal Index	(0018,5029)	3	Not used
Depth of Scan Field	(0018,5050)	3	Not used
Image Transformation Matrix	(0018,5210)	3	Not used
Image Translation Vector	(0018,5212)	3	Not used
Overlay Subtype	(60xx,0045)	3	Not used

4.4.2 General Modules

The SOP Common Module is mandatory for all DICOM IODs.

4.4.2.1 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 4-8
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.3.1
SOP Instance UID	(0008,0018)	1	Uniquely generated by the equipment
Specific Character Set	(0008,0005)	1C	ISO_IR 100 = Latin Alphabet No. 1
Instance Number	(0020,0013)	3	Based on order the images are acquired.

5. MODALITY WORKLIST QUERY IMPLEMENTATION

5.1 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.

5.2 VENUE 50 MAPPING OF DICOM ENTITIES

The Venue 50 maps DICOM Information Entities to local Information Entities.

TABLE 5-1
MAPPING OF DICOM ENTITIES TO VENUE 50 ENTITIES

DICOM	Venue 50 Entity
Scheduled Procedure Step	
Requested Procedure	Exam
Imaging Service Request	Exam
Visit	Exam
Patient	Patient

5.3 WORKLIST QUERY MODULE TABLE

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

TABLE 5-2
MODALITY WORKLIST INFORMATION MODEL MODULES

Entity Name	Module Name	Reference
Scheduled Procedure Step	SOP Common	5.4.1.1
	Scheduled Procedure Step	5.4.1.2
Requested Procedure	Requested Procedure	5.4.2.1
Imaging Service Request	Imaging Service Request	5.4.3.1
Visit	Visit Identification	NA
	Visit Status	NA
	Visit Relationship	5.4.4.1
	Visit Admission	NA
Patient	Patient Relationship	NA
	Patient Identification	5.4.5.2
	Patient Demographic	5.4.5.3
	Patient Medical	NA

5.4 WORKLIST QUERY MODULE DEFINITIONS

Please refer to DICOM Standard PS 3.3. (Information Object Definitions) for a description of each of the query key attributes contained within the Modality Worklist Information Model.

5.4.1 Common Scheduled Procedure Step Entity Modules

5.4.1.1 SOP Common Module

TABLE 5-3
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note
Specific Character Set	(0008,0005)	O	1C	No	Only ISO_IR_100 supported

5.4.1.1.1 Specific Character Set

Only ISO_IR 100 supported.

5.4.1.2 Scheduled Procedure Step Module

TABLE 5-4
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note
Scheduled Procedure Step Sequence	(0040,0100)	R	1	Yes	Sequence Matching

>Scheduled Station AE Title	(0040,0001)	R	1	No	Universal Matching.
>Scheduled Procedure Step Start Date	(0040,0002)	R	1 *	No	Matching to a range up to 60 days in the future or the past of the date of the machine. This is configured on the system.
>Scheduled Procedure Step Start Time	(0040,0003)	R	1	No	Universal Matching.
>Modality	(0008,0060)	R	1 *	No	Single value matching based on 2 character string. The default string is "US", but can be changed at time of the query.
>Scheduled Performing Physician's Name	(0040,0006)	R	2	No	Universal Matching.
>Scheduled Procedure Step Description	(0040,0007)	O	1C	Yes	Universal Matching.
>Scheduled Station Name	(0040,0010)	O	2	No	Universal Matching.
>Scheduled Procedure Step Location	(0040,0011)	O	2	No	Universal Matching.
>Pre-Medication	(0040,0012)	O	2C	No	Universal Matching.
>Scheduled Procedure Step ID	(0040,0009)	O	1	No	Universal Matching.
>Requested Contrast Agent	(0032,1070)	O	2C	No	Universal Matching.
>Comments on the Scheduled Procedure Step	(0040,0400)	O	3	No	Universal Matching.

5.4.1.2.1 Scheduled Station AE Title

5.4.2 Common Requested Procedure Entity Modules

5.4.2.1 Requested Procedure Module

TABLE 5-5
REQUESTED PROCEDURE MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note
Requested Procedure ID	(0040,1001)	O	1	Yes	Universal Matching.
Study Instance UID	(0020,000D)	O	1	Yes	Universal Matching.
Referenced Study Sequence	(0008,1110)	O	2	Yes	Sequence Matching
>Referenced SOP Class UID	(0008,1150)	O	1C	Yes	Universal Matching.

>Referenced SOP Instance UID	(0008,1155)	O	1C	Yes	Universal Matching.

5.4.3 Common Imaging Service Request Entity Modules

5.4.3.1 Imaging Service Request Module

TABLE 5-6
IMAGING SERVICE REQUEST MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note
Accession Number	(0008,0050)	O	2 *	Yes	Universal Matching. Not Truncated.
Referring Physician's Name	(0008,0090)	O	2	Yes	Universal Matching. Not Truncated.

Note: * in the *Expected Return Key Type* column indicates that this information is displayed on screen, if available

5.4.4 Common visit Entity Modules

5.4.4.1 Visit Relationship

TABLE 5-7
VISIT RELATIONSHIP MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note
Referenced Patient Sequence	(0008,1120)	O	2	Yes	Sequence Matching
>Referenced SOP Class UID	(0008,1150)	O	1C	Yes	Universal Matching.
>Referenced SOP Instance UID	(0008,1155)	O	1C	Yes	Universal Matching.

5.4.5 Common Patient Entity Modules

5.4.5.1 Patient Relationship

5.4.5.2 Patient Identification

TABLE 5-9
PATIENT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note

Patient's Name	(0010,0010)	R	1 *	Yes	Universal Matching. No truncation. Note: Only the first and last name of the patient will be displayed in the Ultrasound application due to graphical limitations. The Venue 50 will correctly tag the underlying images with the data received from the Worklist SCP.
Patient ID	(0010,0020)	R	1 *	Yes	Universal Matching. No truncation.
Issuer of Patient ID	(0010,0021)	O	3	Yes	Universal Matching. No truncation.
Other Patient IDs	(0010,1000)	O	3	Yes	Universal Matching. No truncation.
Other Patient IDs Sequence	(0010,1002)	O	3	Yes	Sequence Matching . No truncation.
>Patient ID	(0010,0020)	R	1	Yes	Universal Matching. . No truncation.
>Issuer of Patient ID	(0010,0021)	O	3	Yes	Universal Matching. . No truncation.
>Type of Patient ID	(0010,0022)	O	3	Yes	Universal Matching. . No truncation.

5.4.5.3 Patient Demographic

TABLE 5-10
PATIENT DEMOGRAPHIC MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Note
Patients Birth Date	(0010,0030)	O	2	Yes	Universal Matching. No truncation.
Patient's Sex	(0010,0040)	O	2	Yes	Universal Matching. No truncation.