Technical
Publications

Direction DOC1821494

Revision 3

Vscan Extend (Version 1.0.3)
CONFORMANCE STATEMENT
for DICOM

Copyright© 2016 By General Electric Co.

Do not duplicate

GE Ultrasound

THIS PAGE LEFT INTENTIONALLY BLANK

CONFORMANCE STATEMENT OVERVIEW

Vscan Extend is an Ultrasound scanner acting as an acquisition modality in a DICOM network.

Table 0.1 provides an overview of the network services supported by Vscan Extend.

Table 0.1 – NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Ultrasound Image Storage	Yes / Option*	No
Ultrasound Multi-frame Image Storage	Yes / Option*	No
Secondary Capture Image Storage	Yes / Option*	No
Multi-Frame True Color Secondary Capture 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 Vscan Extend.

CONFORMANCE STATEMENT OVERVIEW
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 (Ultrasound Information Object Implementation), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of an Ultrasound Image Information Object.

Section 4 (Ultrasound Multi-Frame Information Object Implementation), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of an Ultrasound Multi-Frame Information Object.

Section 5 (SC Object Implementation), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of a Secondary Capture Information Object.

Section 6 (Multi-Frame True Color SC Information Object Implementation), which specifies the GEHC equipment compliance to DICOM requirements for the implementation of an Multi-Frame True Color Secondary Capture Information Object.

Section 7 (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 Conformance Statements and their relationship with the DICOM Conformance Statements is shown in the Illustration below.

GEHC DICOM Conformance Statements

@

http://www.ge.com/DICOM

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

Product Implementation:

CT Advantage

MR Advantage

Vscan Extend
Conformance
Statement
Direction:
DOC1821494

... ...
Conformance
Statement
Direction:
... ...

DICOM STANDARD

Standard Specification:

DICOM

Part 1

M
2

M
3

M
4

DICOM

Part 18

This document specifies the DICOM implementation. It is entitled:

> *Vscan Extend v1.0*
> *Conformance Statement for DICOM*
> *Direction DOC1821494*

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-transmits 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), 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) 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

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, and 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.
CD-R	Compact Disk Recordable.
DHCP	Dynamic Host Configuration Protocol.
DICOM	Digital Imaging and Communications in Medicine.
DNS	Domain Name System.
FSC	File-Set Creator.
FSU	File-Set Updater.

FSR	File-Set Reader.
HIS	Hospital Information System.
HL7	Health Level 7 Standard.
IHE	Integrating the Healthcare Enterprise.
IOD	Information Object Definition.
IPv4	Internet Protocol version 4.
IPv6	Internet Protocol version 6.
ISO	International Organization for Standards.
JPEG	Joint Photographic Experts Group.
LUT	Look-up Table.
MPPS	Modality Performed Procedure Step.
MSPS	Modality Scheduled Procedure Step.
MTU	Maximum Transmission Unit (IP).
MWL	Modality Worklist.
O	Optional (Key Attribute).
OSI	Open Systems Interconnection.
PACS	Picture Archiving and Communication System.
PDU	Protocol Data Unit.
R	Required (Key Attribute).
RIS	Radiology Information System.
SC	Secondary Capture.
SCP	Service Class Provider.
SCU	Service Class User.
SOP	Service-Object Pair.
SPS	Scheduled Procedure Step.
SR	Structured Reporting.
TCP/IP	Transmission Control Protocol/Internet Protocol.
U	Unique (Key Attribute).
UL	Upper Layer.
US	Ultrasound.
VR	Value Representation.

2. NETWORK CONFORMANCE STATEMENT

2.1 INTRODUCTION

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

Vscan Extend is an Ultrasound scanner running on Android system. It allows for the following DICOM functionality:

- Sending Verification Echo messages to DICOM Verification SCP.

- Convert JPEG images to DICOM Secondary Capture/Ultrasound Image and transfer them to a DICOM SCP over a JPEGProcess1 transfer syntax.

- Convert MP4 images to Multi-frame True Color Secondary Capture/US Multi-frame images to a DICOM SCP over a JPEGProcess1 transfer syntax.

- Querying and retrieving DICOM Modality Worklist from a Worklist SCP (RIS).

2.2 IMPLEMENTATION MODEL

2.2.1 Application Data Flow Diagram

The Basic and Specific Application models for Vscan Extend are shown in the following illustration:

ILLUSTRATION 2–1
VSCAN EXTEND NETWORK APPLICATION MODEL AND DATA FLOW
DIAGRAM
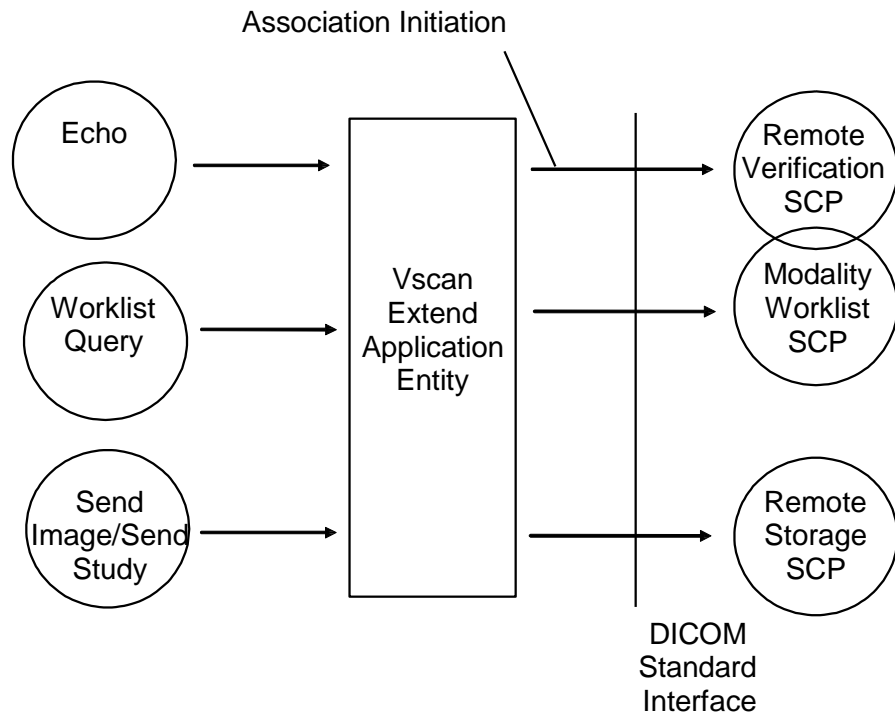
There are three local real-world activities that occur in Vscan Extend ---

Exam Save, Echo, Worklist Query,

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

Exam save, initiates a connection with the DICOM SCP and transmits images and results to the DICOM SCP.

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

2.2.2   Functional Definition of AE's

Application Entity Vscan Extend supports the following functions:

- Initiates a DICOM Verification to assist in network diagnostics.

- Initiates a DICOM association to send images.

- Initiates a DICOM worklist query to receive worklist information.

2.2.3   Sequencing of Real-World Activities:

1. Network configuration of the system should be accomplished first.
2. System configuration allows for Echo, Store and MWL configuration of Remote SCP's which will have a server alias name on Vscan Extend.
3. DICOM Verification should be performed during configuration enabling the user to perform network diagnostics before procedures.
4. Image Send can be performed during or after the exam.
5. MWL query and retrieval can be performed during or after the exam.

2.3   AE SPECIFICATIONS:

Configuration must be completed and saved before the system is able to perform DICOM Store, MWL Query or Echo operation.

2.3.1   Vscan Extend AE Specification

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

SOP Class Name	SOP Class UID	SCU	SCP
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Yes	No
Ultrasound Multi-Frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Yes	No
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Yes	No
Multi-Frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	Yes	No
Verification SOP Class	1.2.840.10008.1.1	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 negotiation size for the Vscan Extend is

Maximum Length PDU	16384 – Not Configurable

2.3.1.1.2   Number of Associations

The Vscan Extend does not accept DICOM associations. The Vscan Extend 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:

Vscan Extend Implementation UID	1.2.840.113619.6.425

The Implementation Version Name for this DICOM Implementation is:

Vscan Extend Implementation Version Name	VSCAN-EXTEND

Note: The Implementation Version Name may change in the future without modification of this document.

2.3.1.2   Association Initiation Policy

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

The Vscan Extend 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 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 is as per table mentioned below:

Presentation Context Table – Proposed by AE Vscan Extend for Activity Exam save					
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 Lossy 8-Bit Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.50 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	JPEG Baseline Lossy 8-Bit Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Baseline Lossy 8-Bit Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
Multi-frame True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4	JPEG Baseline Lossy 8-Bit Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.50 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

Following are the status codes that are more specifically processed when receiving messages from 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 user may initiate a DICOM Verification Request in the Config screen.

Associations will be released upon the receipt of each C-ECHO confirmation.

In the event that the SCP does not respond, the operation will time out, close the association and inform the user.

2.3.1.2.2.1.1 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

<table>
<tr><td colspan="6" align="center">Presentation Context Table - Proposed</td></tr>
<tr><td colspan="2" align="center">Abstract Syntax</td><td colspan="2" align="center">Transfer Syntax</td><td align="center">Role</td><td align="center">Extended</td></tr>
<tr><td align="center">Name</td><td align="center">UID</td><td align="center">Name List</td><td align="center">UID List</td><td></td><td align="center">Negotiation</td></tr>
<tr><td>Verification SOP Class</td><td>1.2.840.10008.1.1</td><td>Explicit VR Little Endian
Explicit VR Big Endian
Implicit VR Little Endian</td><td>1.2.840.10008.1.2.1
1.2.840.10008.1.2.2
1.2.840.10008.1.2</td><td>SCU</td><td>None</td></tr>
</table>

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

2.3.1.2.3.1 Associated Real-World Activity

The user may initiate a DICOM Worklist Query in Worklist screen, 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 Tables

<table>
<tr><td colspan="6" align="center">Presentation Context Table – Proposed</td></tr>
<tr><td colspan="2" align="center">Abstract Syntax</td><td colspan="2" align="center">Transfer Syntax</td><td align="center">Role</td><td align="center">Extended</td></tr>
<tr><td align="center">Name</td><td align="center">UID</td><td align="center">Name List</td><td align="center">UID List</td><td></td><td align="center">Negotiation</td></tr>
<tr><td>Modality Worklist Information Model - FIND</td><td>1.2.840.10008.5.1.4.31</td><td>Explicit VR Little Endian
Explicit VR Big Endian
Implicit VR Little Endian</td><td>1.2.840.10008.1.2.1
1.2.840.10008.1.2.2
1.2.840.10008.1.2</td><td>SCU</td><td>None</td></tr>
</table>

2.3.1.2.3.2.1 SOP Specific DICOM Conformance Statement for Worklist SOP Classes

The Vscan Extend device includes matching keys in the Modality Worklist queries as described in Section 7.
The worklist screen will be populated with the results of the FIND query based on the returned data from the server.
The responses will remain on the system until another Worklist Update is performed.

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

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.
	C000-CFFF	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.

2.3.1.3.1.2 Transfer Syntax Selection Policies

Within the Modality Worklist Model, the Vscan Extend will accept the first proposed transfer syntax that it 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 (PS 3.8, PS 3.9)

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

2.4.2 TCP/IP Stack

The TCP/IP stack is inherited from product's operating system.

2.4.2.1 API

Not applicable to this product.

2.4.3 Additional Protocols

The ability to enable and use DHCP as a client is inherited from the product's operating system. Please refer to product documentation for more information.

We do not support to enable and use DNS as a client. It is always through IP address.

2.4.4 IPv4 and IPv6 Support

The product does only support IPv4.

2.5 EXTENSIONS / SPECIALIZATIONS / PRIVATIZATIONS

2.5.1 Private Transfer Syntaxes

No Private Transfer Syntax is supported.

2.6 CONFIGURATION

2.6.1 AE Title/Presentation Address Mapping:

The Local AE title is configurable through the Config screen, see below.

2.6.2 Configurable Parameters

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

- Local AE Title

The following fields are configurable for every remote DICOM AE:

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

2.7 SUPPORT OF CHARACTER SETS:

The Vscan Extend defines the following character sets:

Supported Specific Character Set Defined Terms

Character Set Description	Defined Term
Latin alphabet No. 1	ISO_IR 100
Unicode UTF-8	ISO_IR 192
Japanese	ISO_IR 13, ISO 2022 IR 87
Simplified Chinese	GB18030
Korean	ISO IR 149

2.8 CODES AND CONTROLLED TERMINOLOGY:

2.8.1 Fixed Coded Terminology:

Not applicable.

2.8.2 Mapped 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. ULTRASOUND (US) INFORMATION OBJECT IMPLEMENTATION

3.1 INTRODUCTION

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

3.2 - IOD Implementation

3.3 - IOD Entity-Relationship Model

3.4 - IOD Module Table

3.5 - IOD Module Definition

3.2 US IOD IMPLEMENTATION

This section defines the implementation of US image information object.

3.3 US ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the US Image interoperability schema is shown in Illustration 3.3-1**.** In this figure, the following diagrammatic convention is established to represent the information organization:

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

The relationships are fully defined with the maximum number of possible entities in the relationship shown.

Every Series is unique to that Study. In other words, Study to Series relationship is always 1.

The relationship between Series and Image can have upto n Images per Series, but the Patient to Study/Series relationship has 1 Patient for each Study/Series (a Patient can have more than one Study on the system, however each Study will contain all of the information pertaining to that Patient).

ILLUSTRATION 3.3-1
US IMAGE ENTITY RELATIONSHIP DIAGRAM
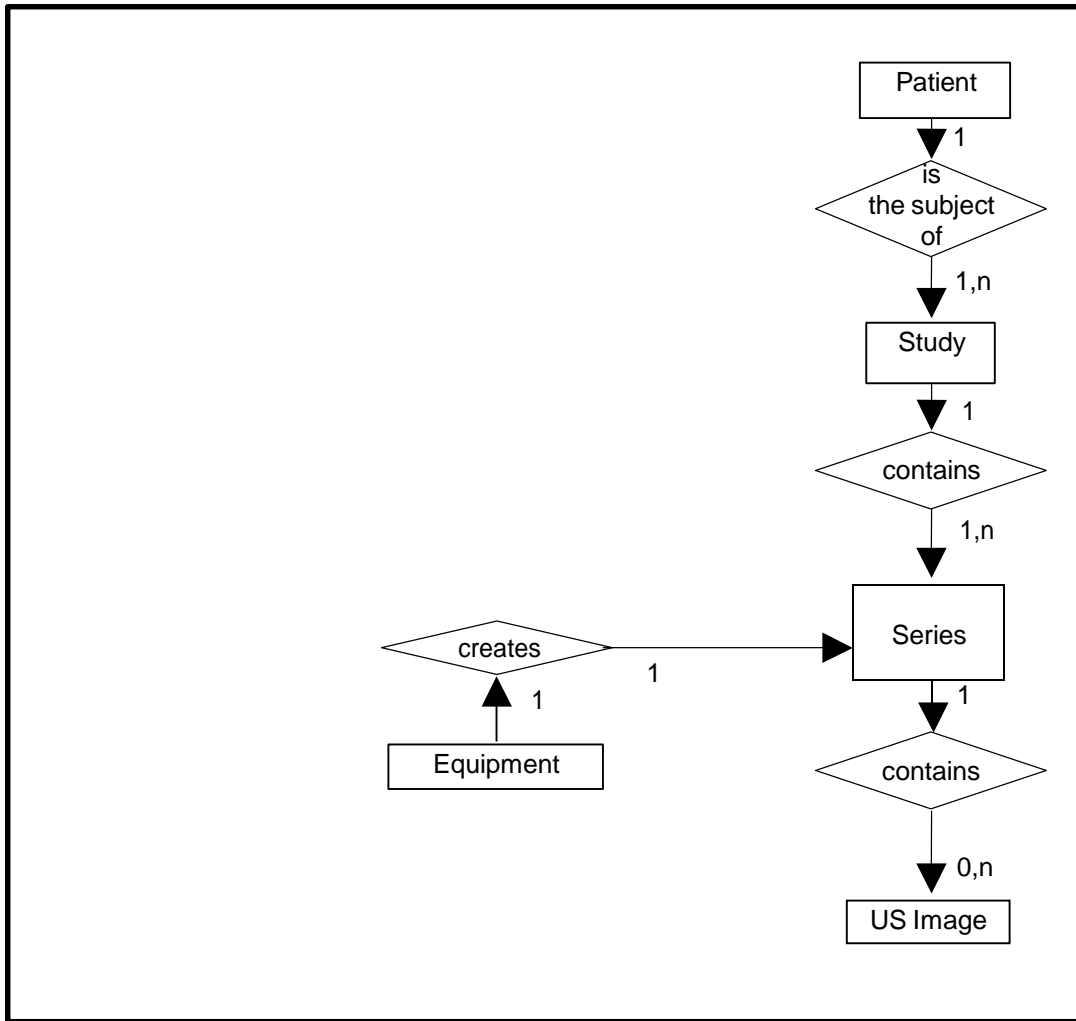
3.3.1   Entity Descriptions

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

3.3.2   Vscan Extend Mapping of DICOM Entities

TABLE 3.3-1
MAPPING OF DICOM ENTITIES TO VSCAN EXTEND ENTITIES

DICOM	Vscan Extend Entity
Patient	Patient
Study	Exam
Series	Series
Image	Image
Frame	Not Applicable

3.4 IOD MODULE TABLE

Within an entity of the DICOM US 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 3.4-1 identifies the defined modules within the entities, which comprise the DICOM US IOD. Modules are identified by Module Name.

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

TABLE 3.4-1
US IMAGE IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	3.5.1.1
Study	General Study	3.5.2.1
	Patient Study	3.5.2.2
Series	General Series	3.5.3.1
Frame of Reference	Frame of Reference	Not used
	US Frame of Reference	Not used
Equipment	General Equipment	3.5.4.1
Image	General Image	3.5.5.1
	Image Pixel	3.5.5.2
	Contrast/Bolus	Not used
	Palette Color Lookup Table	Not used
	US Region Calibration	3.5.7.1
	US Image	3.5.7.2
	Overlay Plane	Not used
	VOI LUT	Not used
	SOP Common	3.5.6.1
Curve	Not used	

3.5 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 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).

3.5.1 Common Patient Entity Modules

3.5.1.1 Patient Module

This section specifies the Attributes of the Patient that describe and identify the Patient who is the subject of a diagnostic Study. This Module contains Attributes of the patient that are needed for diagnostic interpretation of the Image and are common for all studies performed on the patient.

TABLE 3.5-1
PATIENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	May be entered from User Interface. Taken from worklist if it is there.
Patient ID	(0010,0020)	2	May be entered from User Interface. Taken from worklist if it is there.
Patient's Birth Date	(0010,0030)	2	May be entered from User Interface. Taken from worklist if it is there.
Patient's Sex	(0010,0040)	2	May be entered from User Interface. Taken from worklist if it is there.
Referenced Patient Sequence	(0008,1120)	3	Taken from worklist if it is there.
>Referenced SOP Class UID	(0008,1150)	1C	Taken from worklist if it is there.
>Referenced SOP Instance UID	(0008,1155)	1C	Taken from worklist if it is there.
Patient's Birth Time	(0010,0032)	3	Taken from worklist if it is there.
Other Patient Ids	(0010,1000)	3	Taken from worklist if it is there.
Other Patient Names	(0010,1001)	3	Not used
Ethnic Group	(0010,2160)	3	Taken from worklist if it is there.
Patient Comments	(0010,4000)	3	Taken from worklist if it is there.

3.5.2 Common Study Entity Modules

The following Study IE Modules are common to all Composite Image IODs, which reference the Study IE. These modules contain Attributes of the patient and study that are needed for diagnostic interpretation of the image.

3.5.2.1 General Study Module

This section specifies the attributes that describe and identify the Study performed upon the Patient.

TABLE 3.5-2
GENERAL STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	Uniquely generated by the equipment. Taken from worklist if it is there.
Study Date	(0008,0020)	2	Is set to examination date
Study Time	(0008,0030)	2	Is set to examination time
Referring Physician's Name	(0008,0090)	2	Taken from worklist if it is there.
Study ID	(0020,0010)	2	Taken from the equipment.
Accession Number	(0008,0050)	2	Taken from worklist if it is there.
Study Description	(0008,1030)	3	Taken from worklist if it is there (from Requested Procedure Description).
Physician(s) of Record	(0008,1048)	3	Taken from worklist if it is there (from Names of Intended Recipients of Result)

Name of Physician(s) Reading Study	(0008,1060)	3	Not used
Referenced Study Sequence	(0008,1110)	3	Taken from worklist if it is there.
>Referenced SOP Class UID	(0008,1150)	1C	Taken from worklist if it is there.
>Referenced SOP Instance UID	(0008,1155)	1C	Taken from worklist if it is there.
>Procedure Code Sequence	(0008,1032)	3	Taken from worklist if it is there.
>>Code Value	(0008,0100)	1C	Taken from worklist if it is there.
>>Coding Scheme Designator	(0008,0102)	1C	Taken from worklist if it is there.
>>Coding Scheme Version	(0008,0103)	1C	Taken from worklist if it is there.
>>Code Meaning	(0008,0104)	1	Taken from worklist if it is there.

3.5.2.2 Patient Study Module

This section defines attributes that provide information about the Patient at the time that the Study was performed.

TABLE 3.5-3
PATIENT STUDY MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnoses Description	(0008,1080)	3	Not used
Patient's Age	(0010,1010)	3	Not used
Patient's Size	(0010,1020)	3	Taken from worklist if it is there.
Patient's Weight	(0010,1030)	3	Taken from worklist if it is there.
Occupation	(0010,2180)	3	Not used
Additional Patient's History	(0010,21B0)	3	Taken from worklist if it is there.
Admission ID	(0038,0010)	3	Taken from worklist if it is there.
Issuer of Admission ID	(0038,0011)	3	Taken from worklist if it is there.

3.5.3 Common Series Entity Modules

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

3.5.3.1 General Series Module

This section specifies the attributes that identify and describe general information about the Series within a Study.

TABLE 3.5-4
GENERAL SERIES MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Defined Term "US" used.
Series Instance UID	(0020,000E)	1	Uniquely generated by the equipment
Series Number	(0020,0011)	2	Is set to device generated Series Number.
Laterality	(0020,0060)	2C	Not used
Series Date	(0008,0021)	3	Is set to Series date (same as Exam date).
Series Time	(0008,0031)	3	Is set to Series time (same as Series Time)

Performing Physicians' Name	(0008,1050)	3	Taken from worklist if it is there (from Scheduled Performing Physician's Name)
Protocol Name	(0018,1030)	3	Not used.
Series Description	(0008,103E)	3	Not used.
Operator's Name	(0008,1070)	3	Not used.
Referenced Performed Procedure Step Sequence	(0008,1111)	3	Not used.
>Referenced SOP Class UID	(0008,1150)	1C	Not used.
>Referenced SOP Instance UID	(0008,1155)	1C	Not used.
Body Part Examined	(0018,0015)	3	Not used
Patient Position	(0018,5100)	2C	Not used
Smallest Pixel Value in Series	(0028,0108)	3	Not used
Largest Pixel Value in Series	(0028,0109)	3	Not used
Request Attributes Sequence	(0040,0275)	3	Used from Modality Worklist.
>Requested Procedure ID	(0040,1001)	1C	Taken from worklist if it is there.
>Scheduled Procedure Step ID	(0040,0009)	1C	Taken from worklist if it is there.
>Scheduled Procedure Step Description	(0040,0007)	3	Taken from worklist if it is there.
>Scheduled Protocol Code Sequence	(0040,0008)	3	Taken from worklist if it is there.
>>Include 'Code Sequence Macro'			
Performed Procedure Step ID	(0040,0253)	3	Not used.
Performed Procedure Step Start Date	(0040,0244)	3	Not used.
Performed Procedure Step Start Time	(0040,0245)	3	Not used.
Performed Procedure Step Description	(0040,0254)	3	Not used.
Performed Protocol Code Sequence	(0040,0260)	3	Taken from worklist if it is there.
>Include 'Code Sequence Macro'			

3.5.4   Common Equipment Entity Modules

The following Equipment IE Module is common to all Composite Image IODs, which reference the Equipment IE.

3.5.4.1   General Equipment Module

This section specifies the attributes that identify and describe the piece of equipment, which produced a Series of Images.

TABLE 3.5-5
GENERAL EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	Is set to "GE Healthcare"
Institution Name	(0008,0080)	3	Taken from device settings.
Institution Address	(0008,0081)	3	Not used.
Station Name	(0008,1010)	3	Taken from device settings.
Institutional Department Name	(0008,1040)	3	Not used.
Manufacturer's Model Name	(0008,1090)	3	Is set to "Vscan Extend".
Device Serial Number	(0018,1000)	3	Not used

Software Versions	(0018,1020)	3	Is set to Vscan Extend software version.
Spatial Resolution	(0018,1050)	3	Not used
Date of Last Calibration	(0018,1200)	3	Not used
Time of Last Calibration	(0018,1201)	3	Not used
Pixel Padding Value	(0028,0120)	3	Not used

3.5.5   Common Image Entity Modules

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

3.5.5.1   General Image Module

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

TABLE 3.5-6
GENERAL IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Internal value which is incremented for each image within a series
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
Acquisition Date time	(0008,002A)	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	Set to 01 if image is lossy compressed.
Lossy Image Compression Ratio	(0028,2112)	3	Used if lossy compressed.
Lossy Image Compression Method	(0028,2114)	3	Set to 'ISO_10918_1'.

3.5.5.2   Image Pixel Module

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

TABLE 3.5-7
IMAGE PIXEL MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	Value of '1' if Photometric Interpretation element value has value "PALETTE COLOR" Value of '3' when Photometric Interpretation element value has value "RGB".
Photometric Interpretation	(0028,0004)	1	Defined Values used: "RGB", "PALETTE COLOR"
Rows	(0028,0010)	1	Value depends on scanning mode and configuration setup
Columns	(0028,0011)	1	Value depends on scanning mode and configuration setup.
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	Defined Value '0' - unsigned integer.
Pixel Data	(7FE0,0010)	1	Pixel Data of image.
Planar Configuration	(0028,0006)	1C	Enumerated value 0000H, color-by-pixel, if Photometric Interpretation element value has value 'RGB' (uncompressed) if image is JPEG compressed.
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

3.5.6 General Modules

The SOP Common Module is mandatory for all DICOM IODs.

3.5.6.1 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 3.5-8
SOP COMMON MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	Set to "1.2.840.10008.5.1.4.1.1.6.1" "1.2.840.10008.5.1.4.1.1.3.1" "1.2.840.10008.5.1.4.1.1.7" "1.2.840.10008.5.1.4.1.1.7.4"
SOP Instance UID	(0008,0018)	1	Uniquely generated by the equipment
Specific Character Set	(0008,0005)	1C	Set to "ISO_IR 100" if the device language is any of the European Languages. If the device language is Japanese or Korean or Chinese, this tag is set to "ISO_IR 192".
Instance Creation Date	(0008,0012)	3	Not used
Instance Creation Time	(0008,0013)	3	Not used
Instance Creator UID	(0008,0014)	3	Not used
Instance Number	(0020,0013)	3	Not used

3.5.7 US Modules

This Section describes US Series, Equipment, and Image Modules. These Modules contain attributes that are specific to US Image IOD.

3.5.7.1 US Region Calibration Module

US Region Calibration Module is used to describe multiple regions.

TABLE 3.5-9
US REGION CALIBRATION MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018,6011)	1	Supported.
>Region Location Min x_0	(0018,6018)	1	Value is 0
>Region Location Min y_0	(0018,601A)	1	Value is 0
>Region Location Max x_1	(0018,601C)	1	Value is image width-1.
>Region Location Max y_1	(0018,601E)	1	Value is image height-1
>Physical Units X Direction	(0018,6024)	1	Enumerated Values supported: 0003H cm 0004H seconds
>Physical Units Y Direction	(0018,6026)	1	Enumerated Values supported: 0003H cm 0004H seconds 0007H cm/sec
>Physical Delta X	(0018,602C)	1	Varies with scanning mode
>Physical Delta Y	(0018,602E)	1	Varies with scanning mode

>Reference Pixel x_0	(0018,6020)	3	Varies with scanning mode
>Reference Pixel y_0	(0018,6022)	3	Varies with scanning mode
>Ref. Pixel Physical Value X	(0018,6028)	3	Not used
>Ref. Pixel Physical Value Y	(0018,602A)	3	Not used
>Region Spatial Format	(0018,6012)	1	Supported. The spatial organization of the data within the region.
>Region Data Type	(0018,6014)	1	Supported. The type of data within the region.
>Region Flags	(0018,6016)	1	Bit 0: 0 = Opaque Bit 1: 0 = Not Protected because there may be other regions within the image Bit 2: 0 = Velocity
>Pixel Component Organization	(0018,6044)	1C	Not used
>Pixel Component Mask	(0018,6046)	1C	Not used
>Pixel Component Range Start	(0018,6048)	1C	Not used
>Pixel Component Range Stop	(0018,604A)	1C	Not used
>Pixel Component Physical Units	(0018,604C)	1C	Not used
>Pixel Component Data Type	(0018,604E)	1C	Not used
>Number of Table Break Points	(0018,6050)	1C	Not used
>Table of X Break Points	(0018,6052)	1C	Not used
>Table of Y Break Points	(0018,6054)	1C	Not used
>Number of Table Entries	(0018,6056)	1C	Not used
>Table of Pixel Values	(0018,6058)	1C	Not used
>Table of Parameter Values	(0018,605A)	1C	Not used
>Transducer Frequency	(0018,6030)	3	Not used
>Pulse Repetition Frequency	(0018,6032)	3	Not used
>Doppler Correction Angle	(0018,6034)	3	Not used
>Steering Angle	(0018,6036)	3	Not used
>Doppler Sample Volume X Position	(0018,6038)	3	Not used
>Doppler Sample Volume Y Position	(0018,603A)	3	Not used
>TM-Line Position x_0	(0018,603C)	3	Not used
>TM-Line Position y_0	(0018,603E)	3	Not used
>TM-Line Position x_1	(0018,6040)	3	Not used
>TM-Line Position y_1	(0018,6042)	3	Not used

3.5.7.2 US Image Module

This section specifies the attributes that describe ultrasound images.

TABLE 3.5-10
US IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Samples Per Pixel	(0028,0002)	1	Value of '1' if Photometric Interpretation element value has value "PALETTE COLOR" Value of '3' when Photometric Interpretation element value has value "RGB"
Photometric Interpretation	(0028,0004)	1	Defined Values used: "RGB", "PALETTE COLOR".
Bits Allocated	(0028,0100)	1	Value always = 0008H
Bits Stored	(0028,0101)	1	Value always = 0008H
High Bit	(0028,0102)	1	Value always = 0007H
Planar Configuration	(0028,0006)	1	Enumerated value 0000H, color-by-pixel, if Photometric Interpretation element value has value 'RGB' (uncompressed) if image is JPEG compressed.
Pixel Representation	(0028,0103)	1	Always 0000H = unsigned integer.
Frame Increment Pointer	(0028,0009)	1C	Export: Is set to Frame Time (0018,1063) if the image is multi-frame IOD, not used if the image is a single frame IOD.
Image Type	(0008,0008)	2	Set to "ORIGINAL\PRIMARY"
Lossy Image Compression	(0028,2110)	1C	Set to 01 if image is compressed using JPEG Baseline compression.
Number of Stages	(0008,2124)	2C	Not used.
Number of Views in Stage	(0008,212A)	2C	Not used.
R Wave Time Vector	(0018,6060)	3	Not used

Attribute Name	Tag	Type	Attribute Description
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 Code Sequence	(0040,000A)	3	Not used
>Include 'Code Sequence Macro'			
Stage Number	(0008,2122)	3	Not used.
View Name	(0008,2127)	3	Not used.
View Code Sequence	(0054,0220)	3	Not used.
>Include 'Code Sequence Macro'			
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.
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'			

Attribute Name	Tag	Type	Attribute Description
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	Not used
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 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. The contents of this section are:

- **4.2** - IOD Implementation
- **4.3** - IOD Entity-Relationship Model
- **4.4** - IOD Module Table
- **4.5** - IOD Module Definition

4.2 US MF IOD IMPLEMENTATION

This section defines the implementation of US Multi-Frame image information object.

4.3 US MF ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the US MF Image interoperability schema is shown in Illustration 4.3-1. In this figure, the following diagrammatic convention is established to represent the information organization:

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

The relationships are fully defined with the maximum number of possible entities in the relationship shown.

Every Series is unique to that Study. In other words, Study to Series relationship is always 1.

The relationship between Series and Image can have up to n Images per Series, but the Patient to Study/Series relationship has 1 Patient for each Study/Series (a Patient can have more than one Study on the system, however each Study will contain all of the information pertaining to that Patient).

ILLUSTRATION 4.3-1
US MULTIFRAME IMAGE ENTITY RELATIONSHIP DIAGRAM
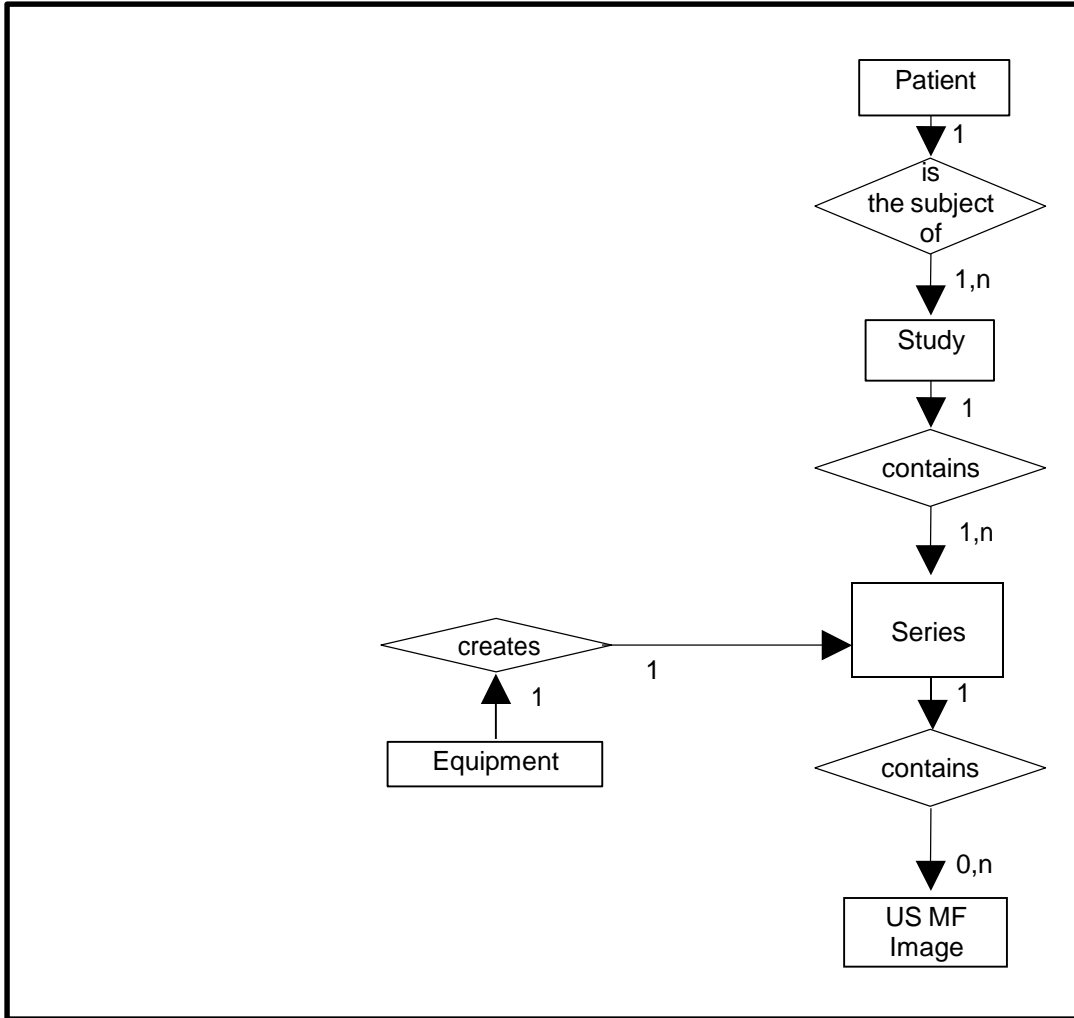
4.3.1 Entity Descriptions

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.

4.3.2 Vscan Extend Mapping of DICOM entities

TABLE 4.3-1
MAPPING OF DICOM ENTITIES TO VSCAN EXTEND ENTITIES

DICOM	Vscan Extend Entity
Patient	Patient
Study	Exam
Series	Series
Image	Image
Curve	Not used

4.4 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 4.4-1 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 4.4-1
US MULTI-FRAME IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	3.5.1.1
Study	General Study	3.5.2.1
	Patient Study	3.5.2.2
Series	General Series	3.5.3.1
Frame of Reference	Frame of Reference	Not used
	US Frame of Reference	Not used
Equipment	General Equipment	3.5.4.1
Image	General Image	3.5.5.1
	Image Pixel	3.5.5.2
	Contrast/Bolus	Not used
	Cine	4.5.1.1
	Multi-frame	4.5.1.2
	Palette Color Lookup Table	Not used
	US Region Calibration	3.5.7.1
	US Image	3.5.7.2
	Overlay Plane	Not used
	VOI LUT	Not used
	SOP Common	3.5.6.1
Curve	Not used	

4.5 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).

4.5.1 Common Image Modules

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

4.5.1.1 Cine Module

TABLE 4.5-1
CINE MODULE ATTRIBUTES

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

4.5.1.2 Multi-frame Module

TABLE 4.5-2
MULTI-FRAME MODULE ATTRIBUTES

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

5 SC INFORMATION OBJECT IMPLEMENTATION

5.1 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. The contents of this section are:

5.2 - IOD Implementation

5.3 - IOD Entity-Relationship Model

5.4 - IOD Module Table

5.5 - IOD Module Definition

5.2 SC IOD IMPLEMENTATION

This section defines the implementation of SC image information object.

5.3 SC ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the SC Image interoperability schema is shown in Illustration 5.3-1**.** In this figure, the following diagrammatic convention is established to represent the information organization:

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

The relationships are fully defined with the maximum number of possible entities in the relationship shown.

Every Series is unique to that Study. In other words, Study to Series relationship is always 1.

The relationship between Series and Image can have up to n Images per Series, but the Patient to Study/Series relationship has 1 Patient for each Study/Series (a Patient can have more than one Study on the system, however each Study will contain all of the information pertaining to that Patient).

ILLUSTRATION 5.3-1
SC IMAGE ENTITY RELATIONSHIP DIAGRAM
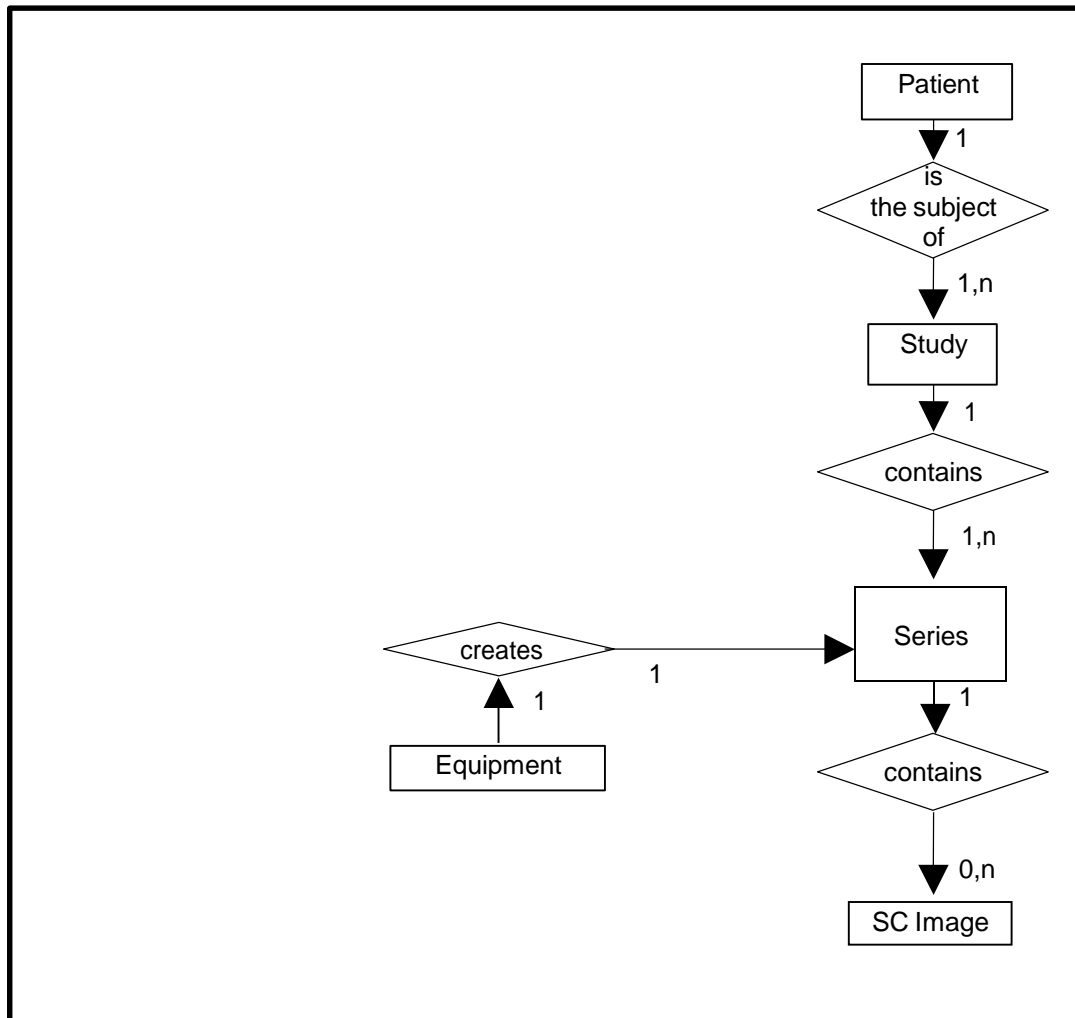
5.3.1   Entity Descriptions

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

5.3.2   Vscan Extend Mapping of DICOM Entities

TABLE 5.3-1
MAPPING OF DICOM ENTITIES TO VSCAN EXTEND ENTITIES

DICOM	Vscan Extend Entity
Patient	Patient
Study	Exam
Series	Series
Image	Image
Frame	Not Applicable

5.4 IOD MODULE TABLE

Within an entity of the DICOM SC 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 5.4-1 identifies the defined modules within the entities, which comprise the DICOM SC IOD. Modules are identified by Module Name.

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

TABLE 5.4-1
SC IMAGE IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	3.5.1.1
Study	General Study	3.5.2.1
	Patient Study	3.5.2.2
Series	General Series	3.5.3.1
Equipment	General Equipment	3.5.4.1
	SC Equipment	5.5.1.1
Image	General Image	3.5.5.1
	Image Pixel	3.5.5.2
	SC Image	5.5.1.2
	Overlay Plane	Not used
	Modality LUT	Not used
	VOI LUT	Not used
	SOP Common	3.5.6.1

5.5 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. 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).

5.5.1   SC Modules

This Section describes SC Equipment, and Image Modules. These Modules contain attributes that are specific to SC Image IOD.

5.5.1.1 SC Equipment Module

This Module describes equipment used to convert images into a DICOM format.

TABLE 5.5-1
SC IMAGE EQUIPMENT MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008,0064)	1	Set to WSD
Modality	(0008,0060)	3	Defined Value "US" used.
Secondary Capture Device ID	(0018,1010)	3	Defined Value "Vscan Extend"
Secondary Capture Device Manufacturer	(0018,1016)	3	Implementation defined string "GE Healthcare"
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	3	Implementation defined string "Vscan Extend"
Secondary Capture Device Software Version	(0018,1019)	3	Is set to Vscan Extend software version
Video Image Format Acquired	(0018,1022)	3	Not used
Digital Image Format Acquired	(0018,1023)	3	Not used

5.5.1.2 SC Image Module

The table in this Section contains IOD attributes that describe SC images.

TABLE 5.5-2
SC IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018,1012)	3	Image capture date
Time of Secondary Capture	(0018,1014)	3	Image capture time

6 MULTI-FRAME TRUE COLOR SC INFORMATION OBJECT IMPLEMENTATION

6.1 INTRODUCTION

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

6.2 - IOD Implementation

6.3 - IOD Entity-Relationship Model

6.4 - IOD Module Table

6.5 - IOD Module Definition

6.2 MULTI-FRAME TRUE COLOR SC IOD IMPLEMENTATION

This section defines the implementation of Multi-frame True Color SC image information object.

6.3 MULTI-FRAME TRUE COLOR SC ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the Multi-frame True Color SC Image interoperability schema is shown in Illustration 6.3-1**.** 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.

Every Series is unique to that Study. In other words, Study to Series relationship is always 1.

The relationship between Series and Image can have up to n Images per Series, but the Patient to Study/Series relationship has 1 Patient for each Study/Series (a Patient can have more than one Study on the system, however each Study will contain all of the information pertaining to that Patient).

ILLUSTRATION 6.3-1

MULTI-FRAME SC TRUE COLOR IMAGE ENTITY RELATIONSHIP DIAGRAM
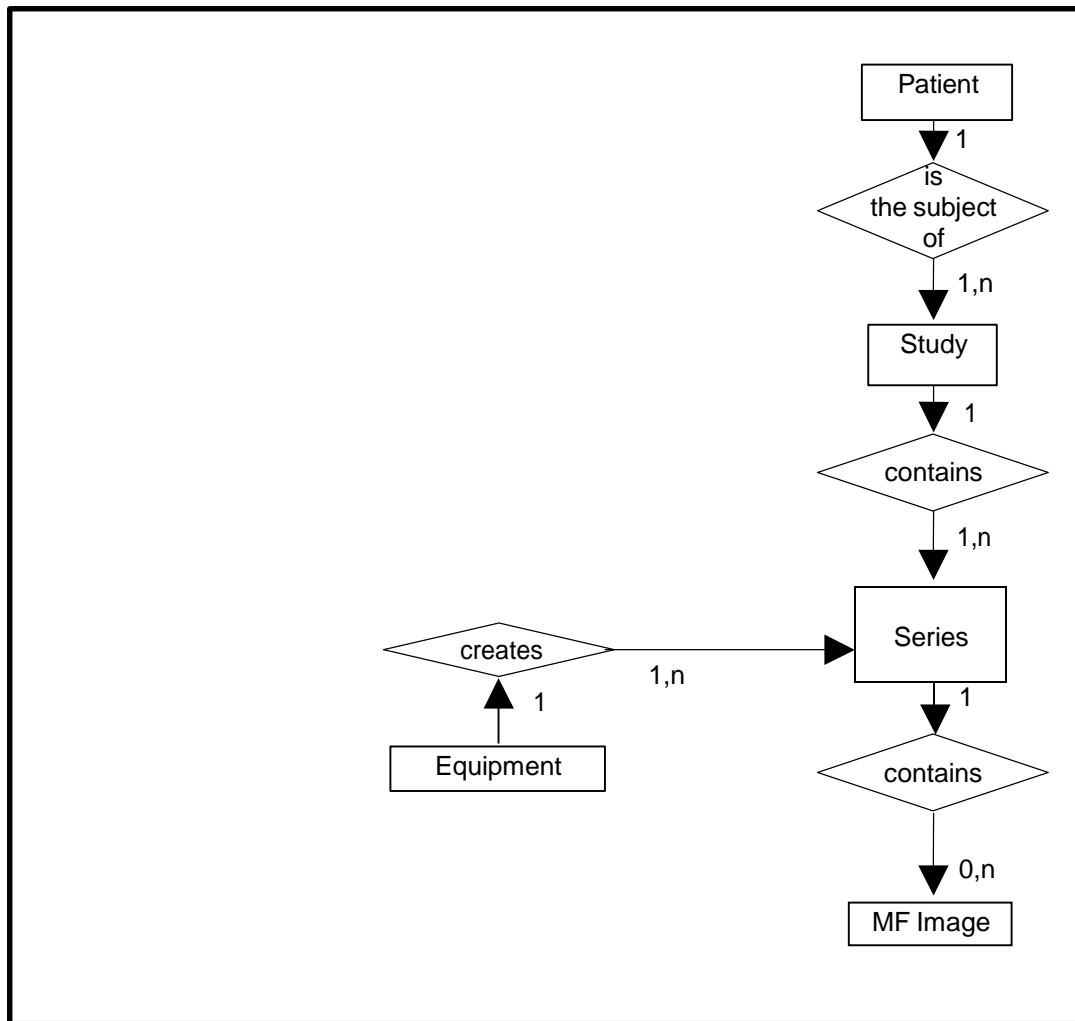
6.3.1 Entity Descriptions

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

6.3.2 Vscan Extend Mapping of DICOM Entities

TABLE 6.3-1
MAPPING OF DICOM ENTITIES TO VSCAN EXTEND ENTITIES

DICOM	VScan Extend Entity
Patient	Patient
Study	Exam
Series	Series
Image	Image
Frame	Not Applicable

6.4 IOD MODULE TABLE

Within an entity of the DICOM MULTI-FRAME TRUE COLOR SC 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 6.4-1 identifies the defined modules within the entities, which comprise the DICOM MULTI-FRAME TRUE COLOR SC IOD. Modules are identified by Module Name.

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

TABLE 6.4-1
MULTI-FRAME TRUE COLOR SC IMAGE IOD MODULES

Entity Name	Module Name	Reference
Patient	Patient	3.5.1.1
Study	General Study	3.5.2.1
	Patient Study	3.5.2.2
Series	General Series	3.5.3.1
Equipment	General Equipment	3.5.4.1
	SC Equipment	5.5.1.1
Image	General Image	3.5.5.1
	Image Pixel	3.5.5.2
	Cine	4.5.1.1
	Multi-frame	4.5.1.2
	SC Image	5.5.1.2
	SC Multi-frame Image	6.5.1.1
	SC Multi-frame Vector	6.5.1.2
	SOP Common	3.5.6.1

6.5 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. 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).

6.5.1   Multi-Frame True Color SC Modules

This Section describes Multi-Frame True Color SC Equipment, and Image Modules. These Modules contain attributes that are specific to SC Image IOD.

6.5.1.1 SC Multi Frame Image Module

The table in this Section contains IOD attributes that describe SC images.

TABLE 6.5-1
SC MULTI FRAME IMAGE

Attribute Name	Tag	Type	Attribute Description
Burned In Annotation	(0028,0301)	1C	Set to "NO"
Frame Increment Pointer	(0028,0009)	1C	Is set to Frame Time (0018,1063)

6.5.1.2   SC Multi-frame Vector Module

The table in this Section contains IOD attributes that describe SC images.

TABLE 6.5-2
SC IMAGE MODULE ATTRIBUTES

Attribute Name	Tag	Type	Attribute Description
Frame Time Vector	(0018,1065)	1C	Not used.

7 MODALITY WORKLIST INFORMATION MODEL DEFINITION

7.1 INTRODUCTION

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

7.2 Information Model Description

7.3 Information Model Entity-Relationship Mode

7.4 Information Model Module Table

7.5 Information Model Keys

7.2 MODALITY WORKLIST INFORMATION MODEL DESCRIPTION

This section defines the implementation of Modality Worklist Information Model.

7.3 MODALITY WORKLIST INFORMATION MODEL ENTITY-RELATIONSHIP MODEL

The Entity-Relationship diagram for the Modality Worklist Information Model schema is shown in Illustration 7.3-1. It represents the information that composes a Worklist Item. In this figure, the following diagrammatic convention is established to represent the information organization:

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

ILLUSTRATION 7.3-1
MODALITY WORKLIST INFORMATION MODEL E/R DIAGRAM
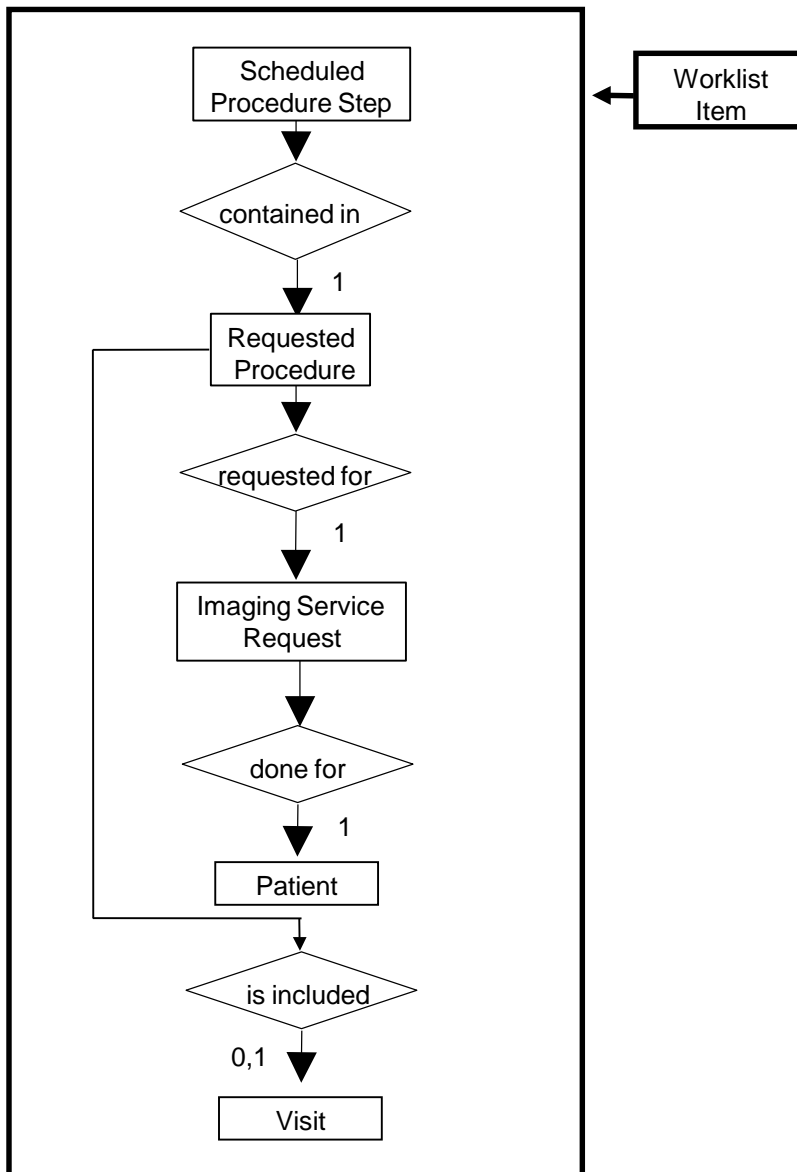
7.3.1 Entity Descriptions

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.

7.3.1.1 Scheduled Procedure Step

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

7.3.1.2   Requested Procedure Entity Description

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

7.3.1.3   Imaging Service Request Entity Description

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

7.3.1.4   Visit Entity Description

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

7.3.1.5   Patient Entity Description

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

7.3.2   Vscan Extend Mapping of DICOM entities

TABLE 7.3-1
MAPPING OF DICOM ENTITIES TO VSCAN EXTEND ENTITIES

DICOM	Vscan Extend Entity
Scheduled Procedure Step	Worklist entry
Requested Procedure	Exam
Imaging Service Request	Exam
Visit	Not Applicable
Patient	Patient

7.4 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 7.4-1 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 7.4-1
MODALITY WORKLIST INFORMATION MODEL MODULES

Entity Name	Module Name	Reference
Scheduled Procedure Step	SOP Common	7.5.2.1
	Scheduled Procedure Step	7.5.2.2
Requested Procedure	Requested Procedure	7.5.3.1
Imaging Service Request	Imaging Service Request	7.5.4.1
Visit	Visit Identification	7.5.5.1
	Visit Status	7.5.5.2
	Visit Relationship	7.5.5.3
	Visit Admission	Not Used
Patient	Patient Relationship	Not Used
	Patient Identification	7.5.6.1
	Patient Demographic	7.5.6.2
	Patient Medical	7.5.6.3

7.5 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 Results in examinations that are based on Worklist entries. Please note that tags that are not defined for SR documents will not be mapped (see Section 7).

7.5.1   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. This means that the user can filter the downloaded C-FIND result, to view a limited set of the result.

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

Wild Card Matching is only used for Patient's Name (0010,0010).

7.5.2 **Scheduled Procedure Step Entity**

7.5.2.1 SOP Common Module

TABLE 7.5-1
SOP COMMON MODULE ATTRIBUTES

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

7.5.2.2 Scheduled Procedure Step Module

TABLE 7.5-2
SCHEDULED PROCEDURE STEP MODULE ATTRIBUTES

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

>Scheduled Procedure Step Location	(0040,0011)	O	2	No	Matching is supported.
>Scheduled Procedure Step ID	(0040,0009)	O	1	Yes	Matching is supported.
>Scheduled Protocol Code Sequence	(0040,0008)	O	1C	Yes	Matching is supported.
>>Code Value	(0008,0100)	O	1	Yes	Matching is supported.
>>Coding Scheme Designator	(0008,0102)	O	1	Yes	Matching is supported.
>>Code Meaning	(0008,0104)	O	3	Yes	Matching is supported.

7.5.3 Requested Procedure Entity

7.5.3.1 Requested Procedure Module

TABLE 7.5-3
REQUESTED PROCEDURE MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Matching
Requested Procedure ID	(0040,1001)	O	1	Yes (to Requested Procedure ID and Study ID)	Matching is supported.
Requested Procedure Description	(0032,1060)	O	1C	Yes (to Study Description)	Matching is supported.
Requested Procedure Code Sequence	(0032,1064)	O	1C	No (to Procedure Code Sequence)	Matching is supported.
>Code Value	(0008,0100)	O	1	No	Matching is supported.
>Code Scheme Designator	(0008,0102)	O	1	No	Matching is supported.
>Code Scheme Version	(0008,0103)	O	3	No	Matching is supported.
>Code Meaning	(0008,0104)	O	3	No	Matching is supported.
Requested Procedure Comments	(0040,1400)	O	3	No	Matching is supported.

Study Instance UID	(0020,000D)	R	1	Yes	Matching is supported.
Referenced Study Sequence	(0008,1110)	O	2	Yes	Matching is supported.
>Referenced SOP Class UID	(0008,1150)	O	1C	Yes	Matching is supported.
>Referenced SOP Instance UID	(0008,1155)	O	1C	Yes	Matching is supported.
Names of Intended Recipients of Results	(0040,1010)	O	3	Yes (to Physician(s) of Record)	Matching is supported.

7.5.4   Imaging Service Request Entity

7.5.4.1   Imaging Service Request Module

TABLE 7.5-4
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	Matching is supported.
Referring Physician's Name	(0008,0090)	O	2	Yes	Matching is supported.
Imaging Service Request Comments	(0040,2400)	O	3	No	Matching is supported.
Requesting Physician	(0032,1032)	O	2	No	Matching is supported.
Requesting Service	(0032,1033)	O	3	No	Matching is supported.

7.5.5   Visit Entity

7.5.5.1   Visit Identification

TABLE 7.5-5
VISIT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Matching
Admission ID	(0038,0010)	O	2	Yes	Matching is supported.
Issuer of Admission ID	(0038,0011)	O	2	Yes	Matching is supported.

7.5.5.2   Visit Status

TABLE 7.5-6
VISIT STATUS MODULE ATTRIBUTES

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

7.5.5.3   Visit Relationship

TABLE 7.5-7
VISIT RELATIONSHIP MODULE ATTRIBUTES

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

7.5.6   Patient Entity

7.5.6.1   Patient Identification

TABLE 7.5-8
PATIENT IDENTIFICATION MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Matching
Patient's Name	(0010,0010)	O	1	Yes	Matching is supported.
Patient ID	(0010,0020)	O	1	Yes	Matching is supported.
Other Patient Ids	(0010,1000)	O	3	Yes	Matching is supported.

7.5.6.2 Patient Demographic

TABLE 7.5-9
PATIENT DEMOGRAPHIC MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Matching
Patients Birth Date	(0010,0030)	O	2	Yes	Matching is supported.
Patients Birth Time	(0010,0032)	O	3	Yes	Matching is supported.
Patient's Sex	(0010,0040)	O	2	Yes	Matching is supported.
Patient's Size	(0010,1020)	O	3	Yes	Matching is supported.
Patient's Weight	(0010,1030)	O	2	Yes	Matching is supported.
Patient's Address	(0010,1040)	O	3	No	Matching is supported.
Ethnic Group	(0010,2160)	O	3	Yes	Matching is supported.
Patient Comments	(0010,4000)	O	3	Yes	Matching is supported.

7.5.6.3 Patient Medical

TABLE 7.5-10
PATIENT MEDICAL MODULE ATTRIBUTES

Attribute Name	Tag	Expected Matching Key Type	Expected Returned Key Type	Mapped into Instance	Matching
Additional Patient History	(0010,21B0)	O	3	Yes	Matching is supported.
Contrast Allergies	(0010,2110)	O	2	No	Matching is supported.
Medical Alerts	(0010,2000)	O	2	No	Matching is supported.
Pregnancy Status	(0010,21C0)	O	2	No	Matching is supported.