



DICOM Conformance Statement
DRYPIX Station IMAGE Manager

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Revision History

Revision	Date	Author	Reason for Change

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3 AE Specification

3.1 IMAGE Manager AE Specification

The IMAGE Manager Application Entity provides Standard Conformance to the following DICOM SOP classes.

SOP Class Name	SOP Class UID	Role
Verification SOP Class	1.2.840.10008.1.1	SCU / SCP
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	SCU
Secondary Capture Image Storage SOP Class	1.2.840.10008.5.1.4.1.1.7	SCU
Storage Commitment Push model SOP Class	1.2.840.10008.1.20.1	SCU
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	SCU

3.1.1 Association Establishment Policies

3.1.1.1 General

- N-EVENT-REPORT of Storage Commitment can be received either through the association that has issued N-ACTION or any other associations. The IMAGE Manager accepts a request for establishing an association so that it is available for the latter case and functions as the SCU in SCP/SCU role selection negotiation.
- The maximum PDU size is 32K Bytes.

3.1.1.2 Number of Associations

The IMAGE Manager will establish the following associations at a time.

- Three associations as C-STORE SCU.
- One association as MWM SCU.
- One association as Basic Grayscale Print Management Meta SOP Class SCU.

3.1.1.3 Asynchronous Nature

Does not support negotiation of multiple outstanding transactions.

3.1.1.4 Implementation ID information

Implementation Class UID is 1.2.392.200036.9125.5399.1

3.1.2 Association Initiation Policy

The IMAGE Manager initiates associations as a result of the following local Real-World activities.

- Transmission of acquired images to the remote host.
- Confirmation that images thus sent to the remote host have been stored successfully.
- Printing of acquired images.
- Request for a remote Worklist.

3.1.2.1 Send Image(s) to Remote AE

3.1.2.1.1 Associated Real-World Activity

The IMAGE Manager will acquire images and send those images automatically to the pre-set remote hosts or select images from the list of images thus stored and send them to the specified destination.

3.1.2.1.2 Proposed Presentation Context

Presentation Context

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	See next table.	SCU	None

Transfer Syntax

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1

3.1.2.1.3 SOP Specific Conformance

This implementation tries to send all images that belong to a single study over a single association. If some of the images could not be sent successfully, this implementation will terminate the association and try to resend all images over another association.

3.1.2.2 Print Image(s)

3.1.2.2.1 Associated Real-World Activity

The IMAGE Manager acquires images and prints those images automatically with a pre-set printer or selects images from the list of images thus stored and prints them by specifying the destination.

3.1.2.2.2 Proposed Presentation Context

Presentation Context

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9	See next table.	SCU	None
Printer SOP Class	1.2.840.10008.5.1.1.16		SCU	None

Transfer Syntax

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.1.2.2.3 SOP Specific Conformance

The IMAGE Manager uses the Basic Grayscale Print Management Meta SOP Class for image printing. Absolutely asynchronously with this, the IMAGE Manager will use only the Printer SOP Class periodically for monitoring status of the printer.

3.1.2.3 Get Worklist

3.1.2.3.1 Associated Real-World Activity

The IMAGE Manager acquires a worklist stored in the RIS. The IMAGE Manager also acquires it as instructed manually.

3.1.2.3.2 Proposed Presentation Context

Presentation Context

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Modality Worklist Information Model - FIND	1.2.840.10008.5.1.4.31	See next table.	SCU	None

Transfer Syntax

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2
Explicit VR Little Endian	1.2.840.10008.1.2.1

3.1.2.3.3 SOP Specific Conformance

The IMAGE Manager can use both Procedure Step and Patient Information or only Patient Information.

3.1.2.4 Storage Commitment

3.1.2.4.1 Associated Real-World Activity

When all images that belong to the same study group have been completely acquired, the IMAGE Manager sends those images to the pre-specified archive. Once all the images are transferred, the commitment request will be sent to the archive on a separate association.

3.1.2.4.2 Proposed Presentation Context

Presentation Context

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Storage Commitment Push Model SOP Class	1.2.840.10008.1.20.1	See next table.	SCU	None

Transfer Syntax

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.1.2.4.3 SOP Specific Conformance

When all images that belong to a study have been completely acquired, those images will be marked "Undeletable." The IMAGE Manager will then send them to the pre-specified image archive. Once all of the images are transferred, the commitment request will be sent to the archive on a separate association. The IMAGE Manager waits for the response from the archive on the same association for a configurable amount of time. If it does not receive the response during this time, it will close the association. The IMAGE Manager can, however, accept a response from the archive at any time on another association.

Once the N-EVENT-REPORT response is received, the following actions will be taken depending on the status of response.

Complete success: The images in the study will be marked "Deletable" and deleted automatically as necessary.

Other cases: The images in the study will remain marked "Undeletable." The images will be deleted manually and not will be deleted automatically.

Image retransmission for a storage commitment that was unsuccessful and reissuance of the storage commitment will both be instructed manually.

3.1.2.5 Verification

3.1.2.5.1 Associated Real-World Activity

The C-ECHO message will be issued if the operator selects remote DICOM AE and issues a verification message.

3.1.2.5.2 Proposed Presentation Context

Presentation Context

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Verification	1.2.840.10008.1.1	See next table.	SCU	None

Transfer Syntax

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.1.2.5.3 SOP Specific Conformance

The IMAGE Manager provides standard conformance to the DICOM Verification Service Class.

3.1.3 Association Acceptance Policy

A single association will be accepted at any time to receive Storage Commitment responses.

A single association will be accepted at any time to verify application level communication by using the C-ECHO service.

3.1.3.1 Verification Request from Remote AE

3.1.3.1.1 Associated Real-World Activity

The IMAGE Manager is indefinitely listening for associations. No operator action is required to respond to a verification message.

3.1.3.1.2 Presentation Context

Presentation Context

Abstract Syntax		Transfer Syntax	Role	Extended Negotiation
Name	UID			
Verification	1.2.840.10008.1.1	See next table.	SCP	None

Transfer Syntax

Name	UID
Implicit VR Little Endian	1.2.840.10008.1.2

3.1.3.1.3 SOP Specific Conformance

The IMAGE Manager provides standard conformance to the DICOM Verification Service Class.

4 Communication Profiles

4.1 Supported Communication Stacks

DICOM Upper Layer is supported using TCP/IP.

4.2 TCP/IP Stack

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

4.3 Physical Media Support

IEEE 802.3 (10BASE-T) / IEEE 802.3U (100BASE-TX)

5 Standard Extended / Specialized / Privatization

None.

6 Configuration

The IMAGE Manager can be configured on the DICOM characteristics specified below.

- ◆ Local
 - IP Address
 - Host name
 - AE Title
 - Port number
- ◆ Remote
 - IP Address
 - Host name
 - AE Title
 - Port number

7 Support of Extended Character Sets

- ISO-IR 100 (Latin Alphabet #1)
- ISO-IR 13/14 (Japanese Katakana: JIS X 0201)
- ISO-IR 87 (Japanese Kanji: JIS X 0208)

8 SC IOD Overview

This section describes the SC IOD that the IMAGE Manager handles.

8.1 SC Image IOD Module Table

Following is a list of the modules used for the SC image storage SOP class.

Information Entity	Module	Usage Method	Reference
Patient	Patient	M	8.2.1.1
Study	General study	M	8.2.2.1
	Patient study	U	Not supported
Series	General series	M	8.2.3.1
	SC series	M	8.2.3.2
Equipment	General equipment	U	8.2.4.1
	SC equipment	M	8.2.6.1
Image	General image	M	8.2.5.1
	Image pixels	M	8.2.5.2
	SC image	M	8.2.6.2
	Overlay plane	U	Not supported
	Modality LUT	U	Not supported
	VOI LUT	U	Not supported
	Common SOP	M	8.2.7.1

8.2 Information Module Definitions

Tags not specifically mentioned in notes are handled in the same way as DICOM definitions.

8.2.1 Patient IE Module

8.2.1.1 Patient Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Patient's Name	(0010,0010)	2	Patient's name	Multi-byte base
Patient ID	(0010,0020)	2	Main hospital ID no. or code for patient	
Patient's Birth Date	(0010,0030)	2	Patient's date of birth	
Patient's Sex	(0010,0040)	2	Patient's sex. Enumerated values: M = Male F = Female O = Other	If not set, Length = 0.

8.2.2 Study IE Module

8.2.2.1 General Study Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Study Instance UID	(0020,000D)	1	Identifier unique to study	A RIS-generated / IDT-generated / DrypixLink-generated number is set. When not obtained from RIS / IDT/DrypixLink, IMAGE Manager will generate this information by following method. 1. Generate UID by each study.
Study Date	(0008,0020)	2	Date study began.	Date compilation of study information began
Study Time	(0008,0030)	2	Time study began.	Time compilation of study information began
Referring Physician's Name	(0008,0090)	2	Physician making referral	Due to the current lack of means of input, Length=0 at the modality. Values received from another company's modalities will be stored.
Study ID	(0020,0010)	2	Study identifier issued by user or equipment	Study ID
Accession Number	(0008,0050)	2	RIS-issued number for identifying order of study.	An RIS-issued study number is set. When not obtained from RIS, IMAGE Manager will generate the number.

8.2.3 Series IE Module

8.2.3.1 General Series Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Modality	(0008,0060)	1	Modality	MR, US, BI, DD, ES, MA, PT, ST, XA, DX, IO, GM, XC, AU, SR, CT, NM, OT, CD, DG, LS, MS, RG, TG, RF, HC, MG, PX, SM, PR, HD
Series Instance UID	(0020,000E)	1	Identifier unique to series	Generate UID by each study / film.
Series Number	(0020,0011)	1	Series ID number	
Laterality	(0020,0060)	2	Whether right or left of body part is to be examined. Necessary when part to be examined is pair-structured. Enumerated values: R = Right L = Left	Length = 0
Series Date	(0008,0021)	3	Date series began	
Series Time	(0008,0031)	3	Time series began	
Series Description	(0008,103E)	3	Description provided by series user	
Body Part Examined	(0018,0015)	3	Description of test of body part to be examined. Definitions: SKULL, CSPINE, TSPINE, LSPINE, SSPINE, COCCYX, CHEST, CLAVICLE, BREAST, ABDOMEN, PELVIS, HIP, SHOULDER, ELBOW, KNEE, ANKLE, HAND, FOOT, EXTREMITY	Conform to configuration files.

8.2.4 Equipment IE Module

8.2.4.1 General Equipment Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Manufacturer	(0008,0070)	2	Name of manufacturer of equipment that generated the digital image.	FUJI PHOTO FILM Co., Ltd.
Institution Name	(0008,0080)	3	Institution at which equipment that generated the digital image was installed.	
Station Name	(0008,1010)	3	User-defined name for identifying the equipment that generated the digital image.	

8.2.5 Common Image IE Module

8.2.5.1 General Image Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Instance Number (Image Number)	(0020,0013)	2	Number that identifies the image	Assumes Length = 0. Stores values received from other modalities.
Patient Orientation	(0020,0020)	2C	Direction patient faced for line or row of image. Necessary for series in which image does not require an image module.	Assumes Length = 0. Stores values received from other modalities.
Image Date	(0008,0023)	2C	Date on which image pixel data generation began. Necessary when image is part of a time-related series.	Sets the date of start of image generation.
Image Time	(0008,0033)	2C	Time at which image pixel data generation began. Necessary when image is part of a time-related series.	Sets the time of start of image generation.
Image Type	(0008,0008)	3	Image identification characteristic. For details, see DICOM PS3.3 C7.6.1.1.2.	"ORIGINAL/PRIMARY"
Acquisition Number	(0020,0012)	3	Number that identifies one continuous acquisition of data over a certain period of time that formed the image.	
Acquisition Date	(0008,0022)	3	Date on which acquisition of data that formed the image began.	Sets the date of start of image generation.
Acquisition Time	(0008,0032)	3	Time at which acquisition of data that formed the image began.	Sets the time of start of image generation.

8.2.5.2 Image Pixel Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Samples per Pixel	(0028,0002)	1	Number of sample surfaces an image has.	Fixed at 1.
Photometric Interpretation	(0028,0004)	1	Specifies the intended interpretation of image data. MONOCHROME1 Indicates that pixel data has a single monochrome image surface. Minimum sample value is to be displayed in white following VOI gray scale conversion. MONOCHROME2 Indicates that pixel data has a single monochrome surface. Minimum sample value is to be displayed in black following VOI gray scale conversion. The following definitions also exist: PALETTE COLOR, RGB, HSV, ARCB, CMYK	MONOCHROME2
Rows	(0028,0010)	1	Number of rows in an image	
Columns	(0028,0011)	1	Number of columns in an image	
Bits Allocated	(0028,0100)	1	Number of bits allocated to each pixel sample. Each sample has the same number of bits allocated.	
Bit Stored	(0028,0101)	1	Number of bits to be stored for each pixel sample. Each sample will have the same number of bits stored.	
High Bit	(0028,0102)	1	High bit for each pixel sample. Each sample will have the same number of high bits.	
Pixel Representation	(0028,0103)	1	Data representation for pixel sample. Each sample will have the same pixel representation. Enumerated values: 0000H: Integer with no encoding 0001H: Complement of 2.	0000H.
Pixel Data	(7FE0,0010)	1	Stream of pixel samples that compose the image.	
Pixel Aspect Ratio	(0028,0034)	1C	Image's pixel aspect ratio in real world, specified as a numerical set of the row value (delimiter) and column value. Necessary when the aspect ratio is not 1/1 and the image surface module is not applicable to this image.	

8.2.6 Secondary Capture Image

8.2.6.1 SC Equipment Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Conversion Type	(0008,0064)	1	Describes the kind of image conversion Defined Terms: DV = Digitized Video DI = Digital Interface DF = Digitized Film WSD = WorkStation	Sets "DI".
Secondary Capture Device Manufacturer	(0018,1016)	3	Manufacturer of the Secondary Capture Device	FUJI PHOTO FILM Co., Ltd.
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	3	Manufacturer's model number of the Secondary Capture Device	Sets the IMAGE Manager model name.
Secondary Capture Device Software Version	(0018,1019)	3	Manufacturer's designation of software version of the Secondary Capture	Sets the software version of IMAGE

			Device	Manager.
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8.2.6.2 SC Image Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
Date of Secondary Capture	(0018,1012)	3	The date the Secondary Capture Image was captured.	Sets the date of start of image generation.
Time of Secondary Capture	(0018,1014)	3	The time the Secondary Capture Image was captured.	Sets the time of start of image generation.

8.2.7 General Module

8.2.7.1 SOP Common Module

Attribute Name	Tag	Type	DICOM Definition	Implementation on IMAGE Manager
SOP Class UID	(0008,0016)	1	Uniquely identifies the SOP class.	SC:1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	1	Uniquely identifies the SOP instance.	
Specific Character Set	(0008,0005)	1C	Used to expand the basic figure set or when using a substitute character set. Necessary in expansion or when using a substitute character set. Alphanumerics: No tag European languages: ISO_IR 100 Japanese (backslash is half-size) Half-size kana only:ISO 2022 IR 13 Half-size kana + kanji:ISO 2022 IR 13 \ ISO 2022 IR 87 Kanji only (half-size kana not used): \ ISO 2022 IR 87	

9 Modality Worklist Query/Retrieve Attribute Overview

9.1 Matching Key Attributes

The IMAGE Manager supports three types of queries.

- ◆ The Accession Number Based Query

The Accession Number Based Query requires all the matching key attributes listed in the next table.

Matching key attributes	tag	matching key type	Matching type
Accession Number	0008,0050	O	Single
Modality	0008,0060	R	Single

- ◆ The Patient ID Based Query

The Patient ID Based Query requires all the matching key attributes listed in the next table.

Matching key attributes	tag	matching key type	Matching type
Patient ID	0010,0020	R	Single
Modality	0008,0060	R	Single

- ◆ The Modality Based Query

The Modality Based Query requires all the matching key attributes listed in the next table.

Matching key attributes	tag	matching key type	Matching type
Scheduled Station AE Title	0040,0001	R	Single
Scheduled Procedure Step Start Date	0040,0002	R	Single / Range
Modality	0008,0060	R	Single

9.2 Return Key Attributes

The IMAGE Manager requests the Return Key Attributes listed in the next table.

Notes : The IMAGE Manager will interpret "Scheduled Procedure Step Description (0040,0007)" as Study Menu Name.

SOP Common				
Specific Character Set	(0008,0005)	O		1C
Scheduled Procedure Step				
Scheduled Procedure Step Sequence	(0040,0100)	R		1
>Scheduled Station AE Title	(0040,0001)	R		1
>Scheduled Procedure Step Start Date	(0040,0002)	R		1
>Scheduled Procedure Step Start Time	(0040,0003)	R		1
>Modality	(0008,0060)	R		1
>Scheduled Procedure Step Description	(0040,0007)	O		1C
Requested Procedure				
Study Instance UID	(0020,000D)	O		1
Imaging Service Request				
Accession Number	(0008,0050)	O		2
Requesting Service	(0032,1033)	O		2
Visit Identification				
Visit Status				
Visit Relationship				
Visit Admission				
Patient Relationship				
Patient Identification				
Patient's Name	(0010,0010)	R		1
Patient ID	(0010,0020)	R		1
Patient Demographic				
Patients Birth Date	(0010,0030)	O		3
Patient's Sex	(0010,0040)	O		2
Patient Medical				

Storage Commitment Attribute Overview

The IMAGE Manager sends the attributes listed in the next table.

Attribute	Tag	Note
Transaction UID	0008,1195	
Referenced SOP Sequence	0008,1199	
>Referenced SOP Class UID	0008,1150	References to the SC Image IOD
Referenced SOP Instance UID	0008,1155	
Referenced Study Component Sequence	0008,1111	A reference to the Performed Procedure Step IOD
>Referenced SOP Class UID	0008,1150	
>Referenced SOP Instance UID	0008,1155	

10 DIMSE-Service and Attributes in the Basic Grayscale Print Management

10.1 DIMSE-Service

SOP Class	DIMSE	Usage SCU	Usage
Basic Film Session SOP Class	N-CREATE	M	Used
	N-SET	U	Not used
	N-DELETE	U	Used
	N-ACTION	U	Not used
Basic Film Box SOP Class	N-CREATE	M	Used
	N-SET	U	Not used
	N-DELETE	U	Used
	N-ACTION	M	Used
Image Box SOP Class	N-SET	M	Used
Printer SOP Class	N-EVENT-REPORT	M	Used
	N-GET	U	Used

10.2 Basic Film Session SOP Class

◆ N-CREATE

Name	Tag	Usage	Value
Number of Copies	2000,0010	U	1-99
Print Priority	2000,0020	U	MED/HIGH
Medium Type	2000,0030	U	CLEAR FILM BLUE FILM
Film Destination	2000,0040	U	PROCESSOR BIN_i
Memory Allocation	2000,0060	U	Sum of the image pixels this session contained. (Kilobyte)

10.3 Basic Film Box SOP Class

◆ N-CREATE

Name	Tag	Usage	Value
Image Display Format	2010,0010	M	e.g. STANDARD \1,1
Film Orientation	2010,0040	U	PORTRAIT LANDSCAPE
Film Size ID	2010,0050	U	8INX10IN 11INX14IN 14INX14IN 14INX17IN
Border Density	2010,0100	U	BLACK WHITE 0-300
Trim	2010,0140	U	YES / NO

10.4 Basic Grayscale Image Box SOP Class

◆ N-SET

Name	Tag	Usage	Value
Image Position	2020,0010	M	1-n (frame number)
Requested Image Size	2020,0030	U	
Samples Per Pixel	0028,0002	M	1
Photometric Interpretation	0028,0004	M	MONOCHROME2
Rows	0028,0010	M	
Columns	0028,0011	M	
Pixel Aspect Ratio	0028,0034	MC	If aspect ratio is 1\1, not send.
Bits Allocated	0028,0100	M	16, 8
Bits Stored	0028,0101	M	10, 8
High bit	0028,0102	M	9, 7
Pixel Representation	0028,0103	M	0
Pixel data	7fe0,0010	M	
Polarity	2020,0020	U	NORMAL/REVERSE
Magnification Type	2010,0060	U	NONE, CUBLIC
Smoothing Type	2010,0080	U	SHARP/MEDIUM/SMOOTH
Min Density	2010,0120	U	0-300
Max Density	2010,0130	U	0-300
Configuration	2010,0150	U	1-8/FINE1-FINE8

10.5 Printer SOP Class

◆ N-EVENT-REPORT

Event Type Name	Event Type ID	Attribute	Tag	Usage
Normal	1			
Warning	2	Printer Name	2110,0030	U
		Printer Status Info	2110,0020	U
Failure	3	Printer Name	2110,0030	U
		Printer Info	2110,0020	U

◆ N-GET

Name	Tag	Usage
Printer Status	2110,0010	U
Printer Status Info	2110,0020	U

End