



**DICOM CONFORMANCE STATEMENT
FOR
DIAGNOSTIC ULTRASOUND SYSTEM**

Aplio air

MODEL CUS-AAR00 V1.0

CANON MEDICAL SYSTEMS CORPORATION

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Global: <https://www.medical.canon/Interoperability/DICOM/EN>

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1. CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by *Aplio air*.

**Table 1-1
NETWORK SERVICES**

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Transfer		
Ultrasound Image Storage	Yes	No
Ultrasound Multi-frame Image Storage	Yes	No
Workflow Management		
Modality Worklist Information Model – FIND	Yes	No

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3. INTRODUCTION

3.1 REVISION HISTORY

Table 3.1-1
REVISION HISTORY

REV.	Date of Issue	Author	Description
	April 5, 2024	Canon Medical Systems	Initial Version

3.2 AUDIENCE

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.3 REMARKS

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Canon Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:

- The comparison of different conformance statements is the first step towards assessing interconnectivity between Canon Medical Systems and non-Canon Medical Systems equipment.
- Test procedures should be defined to validate the desired level of connectivity.
- The DICOM standard will evolve to meet the users' future requirements. Canon Medical Systems is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

3.4 DEFINITIONS, TERMS AND ABBREVIATIONS

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.

Abbreviations and terms are as follows:

AE	Application Entity
ACSE	Association Control Service Element
BCP195	Recommendations for Secure Use of Transport Layer Security (TLS) and Datagram Transport Layer Security (DTLS)
CD-R	Compact Disk Recordable
CM	Code Meaning (0008,0104)
CSD	Coding Scheme Designator (0008,0102)
CV	Code Value (0008,0100)
DHCP	Dynamic Host Configuration Protocol
DIMSE	DICOM Message Service Element
DNS	Domain Name System
DVD	A trademark of the DVD forum that is not an abbreviation
DVD±R	DVD Plus/Dash Recordable
EV	Enumerated Value
FSC	File-Set Creator
FSR	File-Set Reader
FSU	File-Set Updater
IE	Information Entity
IEEE	Institute of Electrical and Electronics Engineers
IOD	Information Object Definition
IPv4	Internet Protocol version 4
IPv6	Internet Protocol version 6
ISO	International Standard Organization
JPEG	Joint Photographic Experts Group
MPPS	Modality Performed Procedure Step
MSPS	Modality Scheduled Procedure Step
MWM	Modality Worklist Management
NTP	Network Time Protocol
PDU	Protocol Data Unit
Q/R	Query/Retrieve
RLE	Run Length Encoding
SC Option	Service Class Option
SCU	Service Class User (DICOM client)
SCP	Service Class Provider (DICOM server)
SOP	Service-Object Pair
SR	Structured Reporting
TCP/IP	Transmission Control Protocol/Internet Protocol

TLS	Transport Layer Security
UID	Unique Identifier
USB	Universal Serial Bus
VR	Value Representation

3.5 REFERENCES

NEMA PS3 Digital Imaging and Communications in Medicine (DICOM) Standard, available free at <https://www.dicomstandard.org/>

4. NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

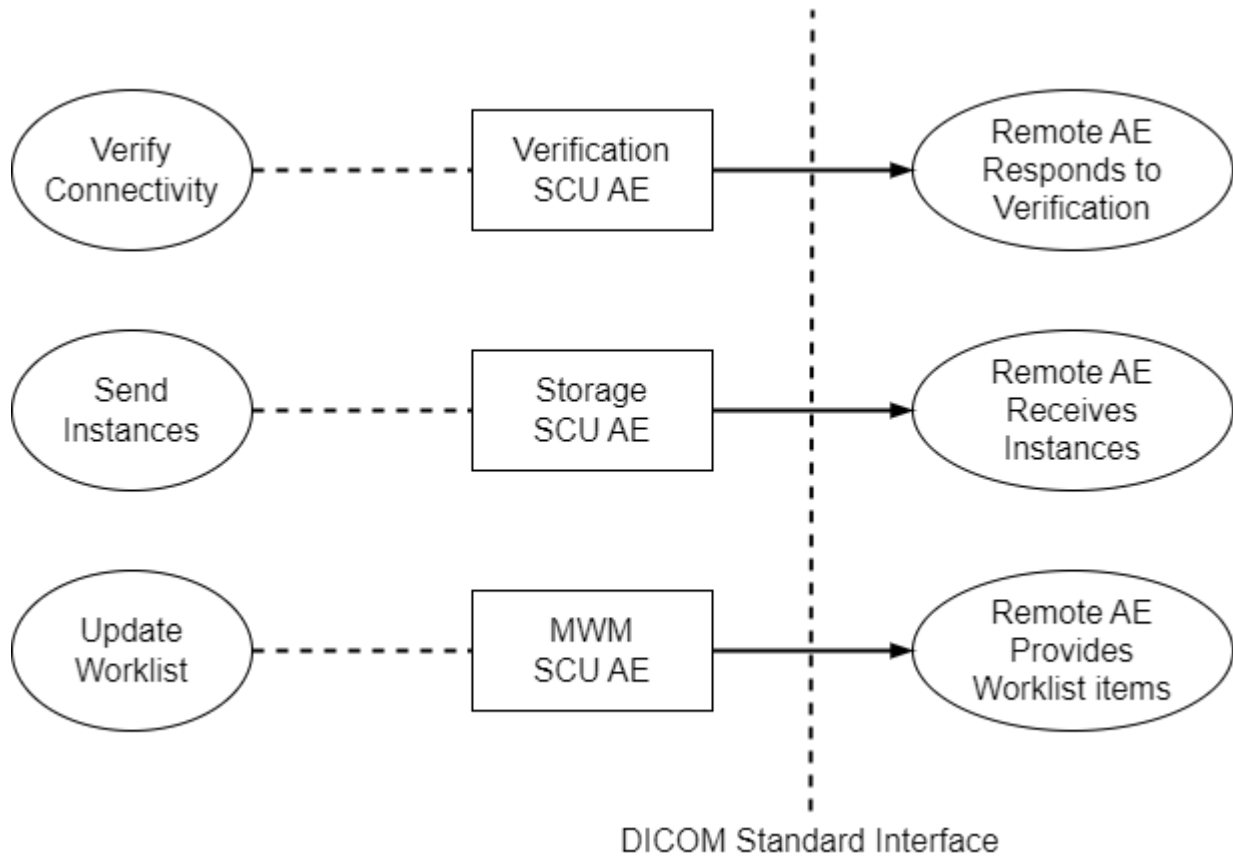


Figure 4.1-1
APPLICATION DATA FLOW DIAGRAM

- The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is associated with the local real-world activity "Verify Connectivity". "Verify Connectivity" is performed via the Service Tool.
- The Storage SCU AE sends instances to a remote AE. It is associated with the local real-world activity "Send Instances". "Send Instances" is performed upon user request for specific instances selected.
- The MWM SCU AE receives worklist information from a remote AE. It is associated with the local real-world activity "Update Worklist". When the "Update Worklist" is performed the MWM SCU AE queries a remote AE for worklist items and provides the set of worklist items matching the query request. "Update Worklist" is performed manually or automatically.

4.1.2 Functional Definition of AEs

4.1.2.1 Functional Definition of Verification SCU AE

The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is performed via the Service Tool.

4.1.2.2 Functional Definition of Storage SCU AE

The existence of a send-job queue entry with associated network destination will activate the Storage SCU AE. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the image transfer fails, the Storage SCU AE will retry this send-job automatically.

4.1.2.3 Functional Definition of MWM SCU AE

The MWM SCU AE attempts to download a worklist from a remote node. If the MWM SCU AE establishes an association to a remote AE, it will transfer patient's information and worklist items via the open association. The results will be displayed in a separate list. The patient's information will be used for the patient registration.

4.1.3 Sequencing of Real-World Activities

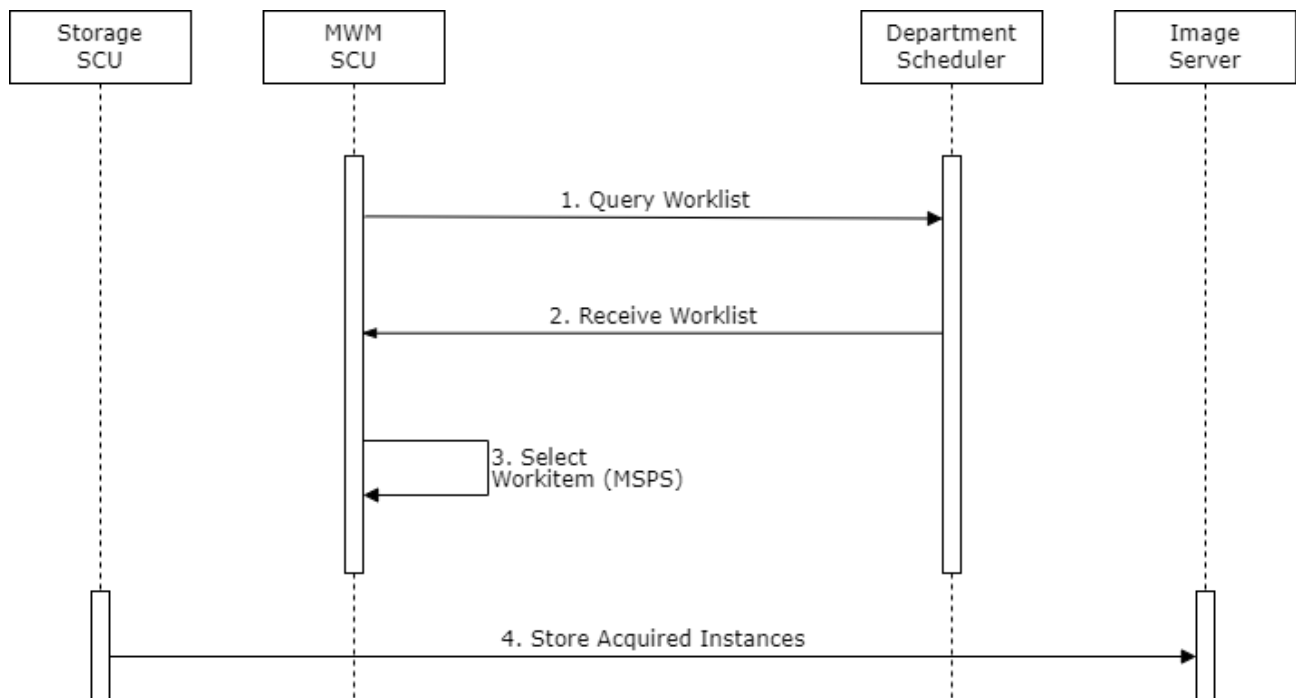


Figure 4.1-2
SEQUENCING CONSTRAINTS

Under typical scheduled workflow conditions the sequencing constraints illustrated in Figure 4.1-2 apply:

1. Query Worklist
2. Receive Worklist of Modality Scheduled Procedure Steps (MSPS)
3. Select Workitem (MSPS) from Worklist
4. Store Acquired Instances

Other workflow situations (e.g. unscheduled procedure steps) will have other sequencing constraints. Some activities may be omitted according to situations.

4.2 AE SPECIFICATIONS

4.2.1 Verification SCU AE Specification

4.2.1.1 SOP Classes

The Verification SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-1
SOP CLASSES FOR THE VERIFICATION SCU AE**

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	Yes	No

4.2.1.2 Association Policies

4.2.1.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-2
DICOM APPLICATION CONTEXT FOR THE VERIFICATION SCU AE**

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

4.2.1.2.2 Number of Associations

The Verification SCU AE initiates one association at a time.

**Table 4.2-3
NUMBER OF ASSOCIATIONS INITIATED FOR THE VERIFICATION SCU AE**

Maximum number of simultaneous associations	1
---	---

4.2.1.2.3 Asynchronous Nature

The Verification SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

**Table 4.2-4
ASYNCHRONOUS NATURE FOR THE VERIFICATION SCU AE**

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.1.2.4 Implementation Identifying Information

The implementation information for the Verification SCU AE is:

**Table 4.2-5
DICOM Implementation Class and Version FOR THE VERIFICATION SCU AE**

Implementation Class UID	1.2.392.200036.9116.6.39.1000.1
Implementation Version Name	CM_UL_DCM_V1.0

4.2.1.3 Association Initiation Policy

4.2.1.3.1 Activity – Verify Connectivity

4.2.1.3.1.1 Description and Sequencing of Activities

The Verification SCU AE attempts to initiate a new association in order to issue a verification request (C-ECHO).

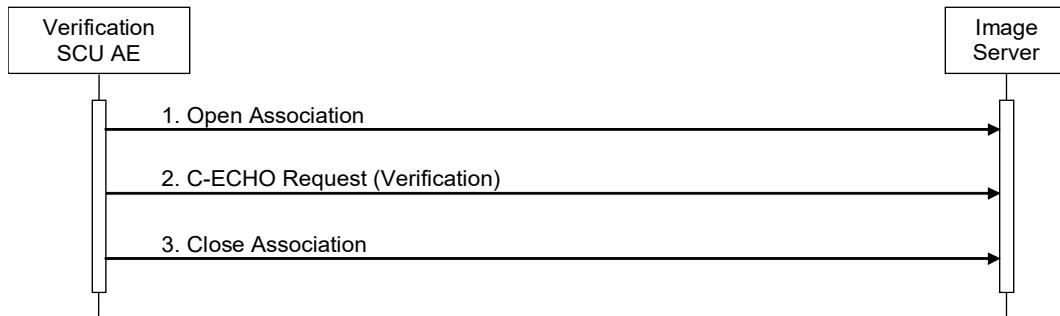


Figure 4.2-1
SEQUENCING OF ACTIVITY – VERIFY CONNECTIVITY

A possible sequence of interactions between the Verification SCU AE and an Image Server (e.g. a storage or archive device supporting the Verification SOP Classes as an SCP) is illustrated in the figure above:

1. The Verification SCU AE opens an association with the Image Server.
2. The Verification SCU AE issues a verification request (C-ECHO) and the Image Server replies with a C-ECHO response (status success).
3. The Verification SCU AE closes the association with the Image Server.

4.2.1.3.1.2 Proposed Presentation Contexts

The Verification SCU AE will propose the Presentation Contexts shown in the following table:

Table 4.2-6
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFY CONNECTIVITY

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.1.3.1.3 SOP Specific Conformance for Verification SOP Class

The Verification SCU AE provides standard conformance to the Verification Service Class as an SCU.

The behavior of Verification SCU AE when encountering status codes in a C-ECHO response is summarized in the table below:

**Table 4.2-7
VERIFICATION RESPONSE STATUS HANDLING BEHAVIOR**

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The Verification SCU AE judges the remote AE is present and active on the network.

The behavior of Verification SCU AE during communication failure is summarized in the table below:

**Table 4.2-8
VERIFICATION COMMUNICATION FAILURE BEHAVIOR**

Exception	Behavior
Timeout	The association is aborted. The loading box disappears on the UI.
Association aborted by the SCP or network layers	The association is aborted. The loading box disappears on the UI.

4.2.2 Storage SCU AE Specification

4.2.2.1 SOP Classes

The Storage SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-9
SOP CLASSES FOR THE STORAGE SCU AE

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		

4.2.2.2 Association Policies

4.2.2.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-10
DICOM APPLICATION CONTEXT FOR THE STORAGE SCU AE

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

4.2.2.2.2 Number of Associations

The Storage SCU AE can initiate up to an association at a time for each destination to which a transfer request is being processed in the active job queue list. Up to ten jobs, that instances will be sent to the different remote hosts, will be active at a time, the other remains pending until the active job is completed or failed.

Table 4.2-11
NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE SCU AE

Maximum number of simultaneous associations	1
---	---

4.2.2.2.3 Asynchronous Nature

The Storage SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-12
ASYNCHRONOUS NATURE FOR THE STORAGE SCU AE

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.2.2.4 Implementation Identifying Information

The implementation information for the Storage SCU AE is:

Table 4.2-13
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE SCU AE

Implementation Class UID	1.2.392.200036.9116.6.39.1000.1
Implementation Version Name	CM_UL_DCM_V1.0

4.2.2.3 Association Initiation Policy

4.2.2.3.1 Activity – Send Instances

4.2.2.3.1.1 Description and Sequencing of Activities

The Storage SCU AE attempts to initiate a new association in order to issue a storage request (C-STORE). If the job contains multiple instances then multiple C-STORE requests will be issued over the same association. If the instance transfer fails, the Storage SCU AE will retry this send-job automatically.

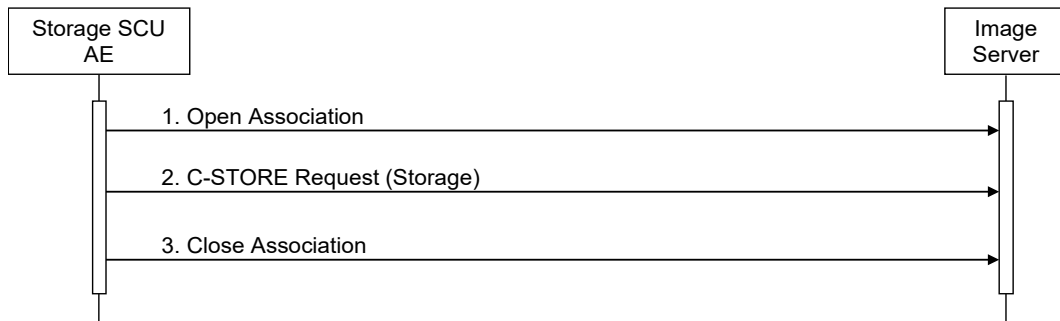


Figure 4.2-2
SEQUENCING OF ACTIVITY – SEND INSTANCES

A possible sequence of interactions between the Storage SCU AE and an Image Server (e.g. a storage or archive device supporting the Storage SOP Classes as an SCP) is illustrated in the Figure above:

1. The Storage SCU AE opens an association with the Image Server.
2. Acquired instances are transmitted to the Image Server using a storage request (C-STORE) and the Image Server replies with a C-STORE response (status success).
3. The Storage SCU AE closes the association with the Image Server.

4.2.2.3.1.2 Proposed Presentation Contexts

The Storage SCU AE will propose the Presentation Contexts in the following table that shows one Presentation Context Item per row:

**Table 4.2-14
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND INSTANCES**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossy* ¹	1.2.840.10008.1.2.4.50		
Ultrasound Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	Implicit VR Little Endian	1.2.840.10008.1.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		JPEG Lossy* ¹	1.2.840.10008.1.2.4.50		

*1 JPEG Baseline (Process 1)

4.2.2.3.1.3 SOP Specific Conformance for Storage SOP Classes

The Storage SCU AE provides standard conformance to the Storage Service Class as an SCU.

The behavior of Storage SCU AE when encountering status codes in a C-STORE response is summarized in the table below:

Table 4.2-15
STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has successfully stored the SOP Instance. If all SOP Instances in a send job have status success then the job is marked as complete.
*	*	Any other status code	The association is aborted and the send job is marked as failed.

The behavior of Storage SCU AE during communication failure is summarized in the table below:

Table 4.2-16
STORAGE COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The association is aborted and the send job is marked as failed. An error message will appear on the UI
Association aborted by the SCP or network layers	The send job is marked as failed. An error message will appear on the UI

If the instance transfer fails, the Storage SCU AE will retry this send-job automatically (see Section 4.4.2).

The contents of Storage SOP Instances created by the Storage SCU AE conform to the IOD definitions and are described in section 8.1.

4.2.3 MWM SCU AE Specification

4.2.3.1 SOP Classes

The MWM SCU AE provides Standard Conformance to the following SOP Classes:

Table 4.2-17
SOP CLASSES FOR THE MWM SCU AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Yes	No

4.2.3.2 Association Policies

4.2.3.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

Table 4.2-18
DICOM APPLICATION CONTEXT FOR THE MWM SCU AE

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

4.2.3.2.2 Number of Associations

The MWM SCU AE initiates one association at a time for a worklist request.

Table 4.2-19
NUMBER OF ASSOCIATIONS INITIATED FOR THE MWM SCU AE

Maximum number of simultaneous associations	1
---	---

4.2.3.2.3 Asynchronous Nature

The MWM SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

Table 4.2-20
ASYNCHRONOUS NATURE FOR THE MWM SCU AE

Maximum number of outstanding asynchronous transactions	1
---	---

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-21
DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MWM SCU AE

Implementation Class UID	1.2.392.200036.9116.6.39.1000.1
Implementation Version Name	CM_UL_DCM_V1.0

4.2.3.3 Association Initiation Policy

4.2.3.3.1 Activity – Update Worklist

4.2.3.3.1.1 Description and Sequencing of Activities

The request for an "Update Worklist" is initiated by user interaction, i.e. pressing the buttons "Get Worklist" or automatically at the time of patient registration.

Upon initiation of the request, the MWM SCU AE will build an Identifier for the C-FIND request, will initiate an association to send the request and will wait for worklist responses. After retrieval of all responses, the MWM SCU AE will access the local database to add or update patient demographic data. The results will be displayed in a separate list.

The MWM SCU AE will initiate an association in order to issue a C-FIND request according to the Modality Worklist Information Model.

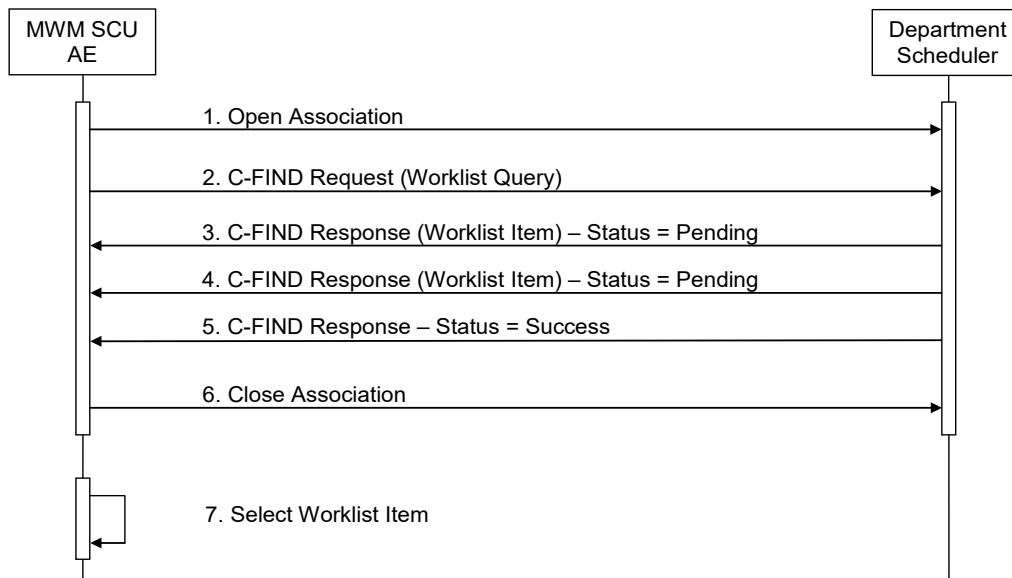


Figure 4.2-3
SEQUENCING OF ACTIVITY – UPDATE WORKLIST

A possible sequence of interactions between the MWM SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the Modality Worklist SOP Class as an SCP) is illustrated in the Figure above:

1. The MWM SCU AE opens an association with the Department Scheduler
2. The MWM SCU AE sends a C-FIND request to the Department Scheduler containing the Worklist Query attributes.
3. The Department Scheduler returns a C-FIND response containing the requested attributes of the first matching worklist item.
4. The Department Scheduler returns another C-FIND response containing the requested attributes of the second matching worklist item.
5. The Department Scheduler returns another C-FIND response with status Success indicating that no further matching worklist items exist. This example assumes that only 2 worklist items match the Worklist Query.
6. The MWM SCU AE closes the association with the Department Scheduler.
7. The user selects a worklist item from the Worklist and prepares to acquire new instances.

4.2.3.3.1.2 Proposed Presentation Contexts

The MWM SCU AE will propose Presentation Contexts shown in the following table:

**Table 4.2-22
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY UPDATE WORKLIST**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext.Neg.
Name	UID	Name List	UID List		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.3.3.1.3 SOP Specific Conformance for Modality Worklist SOP Class

The MWM SCU AE provides standard conformance to the Modality Worklist SOP Class as an SCU.

The behavior of the MWM SCU when encountering status codes in a Modality Worklist C-FIND response is summarized in the table below.

**Table 4.2-23
MODALITY WORKLIST C-FIND RESPONSE STATUS HANDLING BEHAVIOR**

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
Refused	Out of Resources	A700	The Association is aborted using A-ABORT and the worklist query is marked as failed.
Failed	Identifier does not match SOP Class	A900	
Failed	Unable to Process	Cxxx	
Cancel	Matching terminated due to Cancel request	FE00	If the query was cancelled due to too many worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. Otherwise, the Association is aborted using A-ABORT and the worklist query is marked as failed.
Pending	Matches are continuing	FF00	The worklist item contained in the Identifier is collected for later display or further processing.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported	FF01	The worklist item contained in the Identifier is collected for later display or further processing.
*	*	Any other status code	The association is aborted using A-ABORT.

The behavior of the MWM SCU AE during communication failure is summarized in the table below.

Table 4.2-24
MODALITY WORKLIST COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The association is aborted using A-ABORT. The loading box disappears on the UI and existing worklists are not replaced.
Unsupported character sets	
Association aborted by the SCP or network layers	The association is aborted using A-ABORT. The loading box disappears on the UI and existing worklists are not replaced.

Acquired instances will always use the Study Instance UID specified for the Scheduled Procedure Step (if available). If an acquisition is unscheduled, a Study Instance UID will be generated locally.

The table below provides a description of the MWM SCU AE Worklist Request Identifier and specifies the attributes that are copied into the instances. Unexpected attributes returned in a C-FIND response are ignored.

**Table 4.2-25
WORKLIST REQUEST IDENTIFIER**

Module Name Attribute Name	Tag	VR	M	R	D	IOD
Scheduled Procedure Step						
Scheduled Procedure Step Sequence	(0040,0100)	SQ				
>Modality	(0008,0060)	CS	S	x	x	x
>Scheduled Station AE Title	(0040,0001)	AE		x	x	
>Scheduled Procedure Step Start Date	(0040,0002)	DA	S,R	x	x	
>Scheduled Procedure Step End Date	(0040,0004)	DA		x		
Requested Procedure						
Study Instance UID	(0020,000D)	UI		x		
Requested Procedure ID	(0040,1001)	SH		x		
Imaging Service Request						
Accession Number	(0008,0050)	SH		x	x	x
Patient Identification						
Patient's Name	(0010,0010)	PN	S	x	x	x
Patient ID	(0010,0020)	LO	S	x	x	x
Patient Demographic						
Patient's Birth Date	(0010,0030)	DA		x	x	x
Patient's Sex	(0010,0040)	CS		x	x	x
Patient's Age	(0010,1010)	AS		x	x	x
Patient's Size	(0010,1020)	DS		x	x	x
Patient's Weight	(0010,1030)	DS		x	x	x
Patient's Address	(0010,1040)	LO		x		
Patient's Telephone Numbers	(0010,2154)	SH		x		

The above table should be read as follows:

- Module Name: The name of the associated module for supported worklist attributes.
- Attribute Name: Attributes supported to build the MWM SCU AE Worklist Request Identifier.
- Tag: DICOM tag for this attribute.
- VR: DICOM VR for this attribute.
- M: Matching keys for (automatic) Worklist Update.
S: Single Value Matching
R: Range Matching
- R: Return keys. An "x" will indicate that the MWM SCU AE will supply this attribute as Return Key with zero length for Universal Matching.
- D: Displayed keys. An "x" indicates that this worklist attribute is displayed to the user during a patient registration. For example, Patient Name will be displayed when registering the patient prior to an examination.
- IOD: An "x" indicates that this worklist attribute is included into all Object Instances created during performance of the related Procedure Step.

Notes: Specific Character Set (0008,0005) will be created if an extended or replacement character set is used in the matching keys.

Lists all schedules regardless of modality, but study always starts as US.

4.2.3.4 Association Acceptance Policy

The MWM SCU AE does not accept associations.

4.3 NETWORK INTERFACES

4.3.1 Physical Network Interface

The application is indifferent to the physical medium over which TCP/IP executes; which is dependent on the underlying operating system and hardware.

4.3.2 Additional Protocols

When host names rather than IP addresses are used in the configuration properties to specify presentation addresses for remote AEs, the application is dependent on the name resolution mechanism of the underlying operating system.

4.3.3 IPv4 and IPv6 Support

This product only supports IPv4 connections.

4.4 CONFIGURATION

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1 Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured via the service tool.

Table 4.4-1
AE TITLE CONFIGURATION TABLE

Application Entity	Default AE Title	Default TCP/IP Port
MWM SCU	<User Specified>	Not Applicable
Verification SCU	<User Specified>	
Storage SCU	<User Specified>	

The default character repertoire excluding the highlighted characters can be used for the AE Titles:

Table 4.4-2
AE TITLE CHARACTER REPERTOIRE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x00											LF		FF	CR		
0x10												ESC				
0x20	SP	!	"	#	\$	%	&	'	()	*	+	,	-	.	/
0x30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
0x40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0x50	P	Q	R	S	T	U	V	W	X	Y	Z	[¥]	^	_
0x60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
0x70	p	q	r	s	t	u	v	w	x	y	z	{		}	~	

4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Title, host name, port number and secured connection of each remote applications are configured using the service tool. The character repertoire of the AE Titles is listed in Table 4.4-2.

4.4.2 Parameters

A large number of parameters related to acquisition and general operation can be configured using the service tool. The table below only shows those configuration parameters relevant to DICOM communication. See the Product's Service Manual for details on general configuration capabilities.

**Table 4.4-3
CONFIGURATION PARAMETERS TABLE**

Parameter	Configurable (Yes/No) [Range]	Default Value
General Parameters		
Maximum PDU send/receive size	No	16384 bytes
Time-out waiting for an acceptance or rejection response to an association request (Application Level Timeout)	No	300 sec
Time-out waiting for a response to an association release request (Application Level Timeout)	No	300 sec
Time-out waiting for completion of a TCP/IP connect request (Low-level timeout)	Yes [1-9999]	300 sec
Time-out awaiting a response to a DIMSE request (Low-Level Timeout)	No	300 sec
Time-out for waiting for data between TCP/IP-packets (Low Level Timeout)	Yes [1-9999]	300 sec
Storage SCU Parameters		
Maximum number of simultaneously initiated associations by the Storage SCU AE	No	10
Number of times a failed send job may be retried	No	Forever, until the job succeeds or user cancels it.
Modality Worklist SCU Parameters		
Maximum number of simultaneously initiated associations by the MWM SCU AE	No	1
Maximum number of worklist items	No	50
Query worklist for specific Scheduled Station AE Title	No	
Query worklist for specific Modality	No	US

5. MEDIA INTERCHANGE

This product does not support Media Storage

Although this product does not support profiles such as AUG-GEN-CD, STD-GEN-DVD-JPEG, and STD-GEN-USB-JPEG, this product has the function to export in DICOM File format (PS 3.10).

6. SUPPORT OF CHARACTER SETS

This product supports the following character sets:

- ISO-IR 100 (Latin alphabet No.1) Supplementary set of ISO 8859
- ISO-IR 144 (Cyrillic) Supplementary set of ISO 8859
- ISO-IR 192 Unicode in UTF-8
- GB18030 GB18030

Notes: If the MWM SCU AE receives worklist items that contain characters from unsupported character sets, it may abort the association using A-ABORT.

7. SECURITY

This product does not support any specific security measures.

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

- a. Firewall or router protections to ensure that only approved external hosts have network access to the product.
- b. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.
- c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

8. ANNEXES

8.1 IOD CONTENTS

8.1.1 Created SOP Instances

Table 8.1-1 specifies the attributes of an Ultrasound Image transmitted by the Storage SCU AE.

Table 8.1-2 specifies the attributes of an Ultrasound Multi-frame Image transmitted by the Storage SCU AE.

The following tables use a number of abbreviations. The abbreviations used in the "Presence of ..." column are:

VNAP	Value Not Always Present (attribute sent zero length if no value is present)
ANAP	Attribute Not Always Present
ALWAYS	Always Present
EMPTY	Attribute is sent without a value
Not Present	All attributes in this module are not present

The abbreviations used in the "Source" column:

MWL	the attribute value source is Modality Worklist
USER	the attribute value source is from user input
AUTO	the attribute value is generated automatically
CONFIG	the attribute value source is a configurable parameter

8.1.1.1 US Image IOD

**Table 8.1-1
IOD OF CREATED US IMAGE SOP INSTANCES**

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-3	ALWAYS
	Clinical Trial Subject	--	Not Present
Study	General Study	Table 8.1-4	ALWAYS
	Patient Study	Table 8.1-5	ALWAYS
	Clinical Trial Study	--	Not Present
Series	General Series	Table 8.1-6	ALWAYS
	Clinical Trial Series	--	Not Present
Frame of Reference	Frame of Reference	--	Not Present
	Synchronization	--	Not Present
Equipment	General Equipment	Table 8.1-7	ALWAYS
Image	General Image	Table 8.1-8	ALWAYS
	Image Pixel	Table 8.1-9	ALWAYS
	Contrast/bolus	--	Not Present
	Palette Color Lookup Table	--	Not Present
	US Region Calibration	Table 8.1-10	ALWAYS
	US Image	Table 8.1-12	ALWAYS
	Overlay Plane	--	Not Present
	VOI LUT	--	Not Present
	SOP Common	Table 8.1-11	ALWAYS
	Private Application	--	Not Present

8.1.1.2 US Multi-frame Image IOD

Table 8.1-2
IOD OF CREATED US MULTI-FRAME IMAGE SOP INSTANCES

IE	Module	Reference	Presence of Module
Patient	Patient	Table 8.1-3	ALWAYS
	Clinical Trial Subject	--	Not Present
Study	General Study	Table 8.1-4	ALWAYS
	Patient Study	Table 8.1-5	ALWAYS
	Clinical Trial Study	--	Not Present
Series	General Series	Table 8.1-6	ALWAYS
	Clinical Trial Series	--	Not Present
Frame of Reference	Frame of Reference	--	Not Present
	Synchronization	--	Not Present
Equipment	General Equipment	Table 8.1-7	ALWAYS
Image	General Image	Table 8.1-8	ALWAYS
	Image Pixel	Table 8.1-9	ALWAYS
	Contrast/bolus	--	Not Present
	Cine	Table 8.1-13	ALWAYS
	Multi-frame	Table 8.1-14	ALWAYS
	Frame Pointers	--	Not Present
	Palette Color Lookup Table	--	Not Present
	US Region Calibration	Table 8.1-10	ALWAYS
	US Image	Table 8.1-15	ALWAYS
	VOI LUT	--エラー! 参照元が見つかりません。	Not Present
	SOP Common	Table 8.1-11	ALWAYS
	Private Application	--	Not Present

8.1.1.3 Common Modules

**Table 8.1-3
PATIENT MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Name	(0010,0010)	PN		VNAP	MWL/ USER
Patient ID	(0010,0020)	LO		ALWAYS	MWL/ USER
Patient's Birth Date	(0010,0030)	DA		VNAP	MWL/ USER
Patient's Sex	(0010,0040)	CS		VNAP	MWL/ USER
Patient Identity Removed	(0012,0062)	CS	Yes or NO	ALWAYS	USER
De-identification Method	(0012,0063)	CS	DCM:113100/113105/113107/ 113108/113109/113111	ANAP	USER

**Table 8.1-4
GENERAL STUDY MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Study Instance UID	(0020,000D)	UI		ALWAYS	AUTO
Study Date	(0008,0020)	DA		ALWAYS	AUTO
Study Time	(0008,0030)	TM		ALWAYS	AUTO
Referring Physician's Name	(0008,0090)	PN		EMPTY	USER
Study ID	(0020,0010)	SH		ALWAYS	AUTO
Accession Number	(0008,0050)	SH		VNAP	USER
Study Description	(0008,1030)	LO		ALWAYS	AUTO

**Table 8.1-5
PATIENT STUDY MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Age	(0010,1010)	AS		VNAP	AUTO
Patient's Size	(0010,1020)	DS		VNAP	MWL/ USER
Patient's Weight	(0010,1030)	DS		VNAP	MWL/ USER

**Table 8.1-6
GENERAL SERIES MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Modality	(0008,0060)	CS	US	ALWAYS	AUTO
Series Instance UID	(0020,000E)	UI		ALWAYS	AUTO
Series Number	(0020,0011)	IS		ALWAYS	AUTO
Series Date	(0008,0021)	DA		ALWAYS	AUTO

Series Time	(0008,0031)	TM		ALWAYS	AUTO
Protocol Name	(0018,1030)	LO	Use the BodyMark category set in the preset. = CARDIAC, GYN, GENERAL, ABD, OB, SMALL PARTS, URO, VESSEL	ALWAYS	AUTO

**Table 8.1-7
GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Manufacturer	(0008,0070)	LO	CANON_MEC	ALWAYS	AUTO
Institution Name	(0008,0080)	LO		ANAP	AUTO
Manufacturer's Model Name	(0008,1090)	LO	CUS-AAR00	ALWAYS	AUTO
Device Serial Number	(0018,1000)	LO		ALWAYS	AUTO
Software Version	(0018,1020)	LO	V1.0 SPxxxx* (*4 digit number)	ALWAYS	AUTO

**Table 8.1-8
GENERAL IMAGE MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Instance Number	(0020,0013)	IS		ALWAYS	AUTO
Patient Orientation	(0020,0020)	CS		EMPTY	AUTO
Content Date	(0008,0023)	DA		ALWAYS	AUTO
Content Time	(0008,0033)	TM		ALWAYS	AUTO
Image Type	(0008,0008)	CS	Value 1: Pixel Data Characteristics "ORIGINAL" or "DERIVED" Value 2: Patient Examination Characteristics "PRIMARY" or "SECONDARY" Value 3: use the BodyMark category set in the preset. = CARDIAC, GYN, GENERAL, ABD, OB, SMALL PARTS, URO, VESSEL Value 4: The following four hexadecimal digits, depending on the image mode. Do not set it for Secondary Capture images. 0001 2D Imaging 0002 M-Mode 0008 PW Doppler 0010 Color Doppler 0100 Color Power	ALWAYS	AUTO

Acquisition Date	(0008,0022)	DA		ALWAYS	AUTO
Acquisition Time	(0008,0032)	TM		ALWAYS	AUTO
Image Comments	(0020,4000)	LT		ANAP	USER
Burned In Annotation	(0028,0301)	CS	YES or NO	ALWAYS	AUTO

**Table 8.1-9
IMAGE PIXEL MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Samples per Pixel	(0028,0002)	US	1 or 3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB or YBR_FULL_422	ALWAYS	CONFIG
Planar Configuration	(0028,0006)	US	0 or 1	ANAP	AUTO
Rows	(0028,0010)	US	[Rows], [Columns]	ALWAYS	AUTO
Columns	(0028,0011)	US	1600, 1600	ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB or OW		EMPTY	AUTO

**Table 8.1-10
US REGION CALIBRATION MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Sequence of Ultrasound Regions	(0018,6011)	SQ		ANAP	AUTO
>Region Spatial Format	(0018,6012)	US		ALWAYS	AUTO
>Region Data Type	(0018,6014)	US		ALWAYS	AUTO
>Region Flags	(0018,6016)	UL		ALWAYS	AUTO
>Region Location Min x0	(0018,6018)	UL		ALWAYS	AUTO
>Region Location Min y0	(0018,601A)	UL		ALWAYS	AUTO
>Region Location Max x1	(0018,601C)	UL		ALWAYS	AUTO
>Region Location Max y1	(0018,601E)	UL		ALWAYS	AUTO
>Physical Units X Direction	(0018,6024)	US		ALWAYS	AUTO
>Physical Units Y Direction	(0018,6026)	US		ALWAYS	AUTO
>Physical Delta X	(0018,602C)	FD		ALWAYS	AUTO
>Physical Delta Y	(0018,602E)	FD		ALWAYS	AUTO

**Table 8.1-11
SOP COMMON MODULE OF CREATED SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Specific Character Set	(0008,0005)	CS	See Section 6	ALWAYS	AUTO
Instance Creation Date	(0008,0012)	DA		ALWAYS	AUTO
Instance Creation Time	(0008,0013)	TM		ALWAYS	AUTO

Instance Creator UID	(0008,0014)	UI	1.2.392.200036.9116.6.39.xx xxxxxx* (*8 digit number)	ALWAYS	AUTO
SOP Class UID	(0008,0016)	UI	1.2.840.10008.5.1.4.1.1.6.1 for US Image 1.2.840.10008.5.1.4.1.1.3.1 for US Multi-frame Image	ALWAYS	AUTO
SOP Instance UID	(0008,0018)	UI		ALWAYS	AUTO

8.1.1.4 US Image Modules

**Table 8.1-12
US IMAGE MODULE OF CREATED US IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Focus Depth	(0018,5012)	DS		ALWAYS	AUTO
Mechanical Index	(0018,5022)	DS		ALWAYS	AUTO
Transducer Type	(0018,6031)	CS		ALWAYS	AUTO
Samples Per Pixel	(0028,0002)	US	1 or 3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB or YBR_FULL_422	ALWAYS	CONFIG
Planar Configuration	(0028,0006)	US	0 or 1	ALWAYS	AUTO
Rows	(0028,0010)	US	[Rows], [Columns] 1600, 1600	ALWAYS	AUTO
Columns	(0028,0011)	US		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB or OW		EMPTY	AUTO

8.1.1.5 US Multi-frame Image Modules

**Table 8.1-13
CINE MODULE OF CREATED US MULTI-FRAME IMAGE SOP INSTANCES**

Attribute Name	Tag	VR	Value	Presence of Value	Source
Start Trim	(0008,2142)	IS		ALWAYS	AUTO
Stop Trim	(0008,2143)	IS		ALWAYS	AUTO
Recommended Display Frame Rate	(0008,2144)	IS		ALWAYS	USER
Cine Rate	(0018,0040)	IS		ALWAYS	USER
Effective Duration	(0018,0072)	DS		ALWAYS	AUTO
Frame Time	(0018,1063)	DS		ALWAYS	AUTO
Frame Delay	(0018,1066)	DS		ALWAYS	AUTO
Actual Frame Duration	(0018,1242)	IS		ALWAYS	AUTO

Table 8.1-14
MULTI-FRAME MODULE OF CREATED US MULTI-FRAME IMAGE SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Number of Frames	(0028,0008)	IS		ALWAYS	AUTO
Frame Increment Pointer	(0028,0009)	AT	<0018,1063>	ALWAYS	AUTO

Table 8.1-15
US IMAGE MODULE OF CREATED US MULTI-FRAME IMAGE SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Focus Depth	(0018,5012)	DS		ALWAYS	AUTO
Mechanical Index	(0018,5022)	DS		ALWAYS	AUTO
Transducer Type	(0018,6031)	CS		ALWAYS	AUTO
Samples per Pixel	(0028,0002)	US	1 or 3	ALWAYS	AUTO
Photometric Interpretation	(0028,0004)	CS	RGB or YBR_FULL_422	ALWAYS	AUTO
Planar Configuration	(0028,0006)	US	0 or 1	ALWAYS	AUTO
Rows	(0028,0010)	US	[Rows], [Columns] 1600, 1600	ALWAYS	AUTO
Columns	(0028,0011)	US		ALWAYS	AUTO
Bits Allocated	(0028,0100)	US	8	ALWAYS	AUTO
Bits Stored	(0028,0101)	US	8	ALWAYS	AUTO
High Bit	(0028,0102)	US	7	ALWAYS	AUTO
Pixel Representation	(0028,0103)	US	0	ALWAYS	AUTO
Pixel Data	(7FE0,0010)	OB		EMPTY	AUTO

8.1.1.6 Other Modules

The tables below show the attributes that extend the standard IODs of US Image and US Multi-frame Image.

Table 8.1-16
PATIENT DEMOGRAPHIC MODULE OF CREATED SOP INSTANCES

Attribute Name	Tag	VR	Value	Presence of Value	Source
Patient's Address	(0010,1040)	LO		VNAP	AUTO
Patient's Telephone Numbers	(0010,2154)	SH		VNAP	AUTO

8.1.2 Usage of Attributes from received IOD's

Not applicable.

8.1.3 Attribute Mapping

The tables below show the relationships between attributes received via Modality Worklist, stored in acquired images.

The cell content conventions should be read as follows:

Copy: The value will be copied from a corresponding source attribute of another DICOM object, as defined by the table column.

Copy from: <DICOM attribute>: The source as specified in the referenced DICOM attribute will be used instead of using the DICOM attribute of the same row as the source.

Equal (internally generated): The value will be internally generated which may be used in more than one DICOM object.

Table 8.1-17

SCHEDULED CASE - ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST AND IMAGE

Attribute Name	Tag	Modality Worklist	Image IOD
Accession Number	(0008,0050)	Source	Copy

8.1.4 Coerced/Modified Fields

Not applicable.

8.2 DATA DICTIONARY OF PRIVATE ATTRIBUTES

Not applicable.

8.3 CODED TERMINOLOGY AND TEMPLATES

Not applicable.

8.4 GRAYSCALE IMAGE CONSISTENCY

Not applicable.

8.5 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

Not applicable.

8.6 PRIVATE TRANSFER SYNTAXES

Not applicable.

8.7 STANDARD EXTENDED AND PRIVATE TEMPLATES

Not applicable.

8.8 DICOM Security Profile Details

Not applicable.