TOSHIBA

No. MIIUS0019EA

DICOM
CONFORMANCE STATEMENT
FOR
DIAGNOSTIC ULTRASOUND SYSTEM

MODEL SSA-770A/700A Aplio V2.00
(DICOM KIT USDI-770A PLUS USDI-772A)

TOSHIBA CORPORATION

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1 Introduction

This document is a DICOM Conformance Statement for Toshiba's diagnostic ultrasound system Aplio, model SSA-770A/700A (DICOM KIT: USDI-770A plus USDI-772A). It is intended to provide the reader with the knowledge of how to integrate this product within a DICOM-compliant hospital network. It details the DICOM Service Classes, Information Objects, and Communication Protocols that are supported by this product as follows:

- Verification Service Class (SCU/SCP)
- Storage Service Class (SCU)
- Query/Retrieve Service Class (SCU)
- Print Management Service Class (SCU)
- Storage Commitment Service Class (SCU)
- MWM (Modality Worklist Management) Service Class (SCU)
- MPPS (Modality Performed Procedure Step) Service Class (SCU)

If the reader is unfamiliar with DICOM, it is recommended that they read the DICOM Specifications prior to reading this conformance statement. Also note that this document is formatted according to the DICOM Specifications, Part 2: Conformance.

1.1 Reference

ACR-NEMA Digital Imaging and Communications in Medicine, DICOM V3.0.

1.2 Definitions

- **Association Establishment** - An Association Establishment is the first phase of communication between two DICOM Application Entities (AEs). The AEs use the Association Establishment to negotiate how data will be encoded and the type of data to be exchanged.
- **Called Application Entity Title** - The Called AE Title defines the intended receiver of an Association.
- **Calling Application Entity Title** - The Calling AE Title defines the requestor of an Association.
- **DICOM Message Service Element (DIMSE)** - A DIMSE defines the services and protocols utilized by an Application Entity to exchange messages.
- **Information Object Definition (IOD)** - An IOD is a data model which is an abstraction of real-world information. This data model defines the nature and attributes relevant to the class of real-world objects represented.
- **Service Class Provider (SCP)** - A Service Class Provider plays the "server" role to perform operations and invoke notifications during an Association. An example of a Storage Service Class Provider would be an image storage device. In this case, the image storage device is storing the image that was sent by a Service Class User.
- **Service Class User (SCU)** - A Service Class User plays the "client" role to invoke operations and perform notifications during an Association. An example of a Storage Service Class User would be an image acquisition device. In this case, the image acquisition device will create and send a DICOM image by requesting that a Service Class Provider store that image.
- **Service/Object Pair (SOP) Class** - A SOP Class is defined by the union of an Information Object Definition and a set of DIMSE Services. A DICOM Application Entity may support one or more SOP Classes. Each SOP Class is uniquely identified by a SOP Class UID.
- **SOP Instance** - A specific occurrence of an Information Object.
- **Transfer Syntax** - The Transfer Syntax is a set of encoding rules that allow DICOM Application Entities to negotiate the encoding techniques (e.g. data element structure, byte ordering, compression) they are able to support. The Transfer Syntax is negotiated during Association Negotiation.
- **Unique Identifier (UID)** - A Unique Identifier is a globally unique, ISO compliant, ASCII-numeric string. It guarantees uniqueness across multiple countries, sites, vendors, and equipment.

1.3 Acronyms, Abbreviations, and Symbols

The following acronyms and abbreviations are used in this document.

- ACC — American College of Cardiology
- ACR — American College of Radiology
- ASCII — American Standard Code for Information Interchange
- AE — Application Entity
- ANSI — American National Standards Institute
- CEN TC251 — Comite Europeen de Normalisation - Technical Committee 251 - Medical Informatics
- DICOM — Digital Imaging and COmmunications in Medicine
- DIMSE — DICOM Message Service Element
- DIMSE-C — DICOM Message Service Element-Composite
- DIMSE-N — DICOM Message Service Element-Normalized
- HIS — Hospital Information System
- HL7 — Health Level 7
- IE — Information Entity
- IOD — Information Object Definition
- ISO — International Standard Organization
- JIRA — Japan Industries Association of Radiological Systems
- NEMA — National Electrical Manufacturers Association
- PDU — Protocol Data Unit
- RIS — Radiology Information System
- SCP — Service Class Provider
- SCU — Service Class User
- SOP — Service Object Pair
- TCP/IP — Transmission Control Protocol/Internet Protocol
- UID — Unique Identifier

2 Implementation Model

2.1 Verification

The Verification service class defines an application level class of service which allows the operator to verify the ability of an application on a remote DICOM device to respond to DICOM messages. The DICOM Service Tool application supports the Verification service and acts as the SCU and SCP. The response to Verification requests from remote applications is handled by the Verification SCP application.

2.1.1 Application Data Flow Diagram

The Network AE implementation acts as the SCU and SCP for the Verification service.

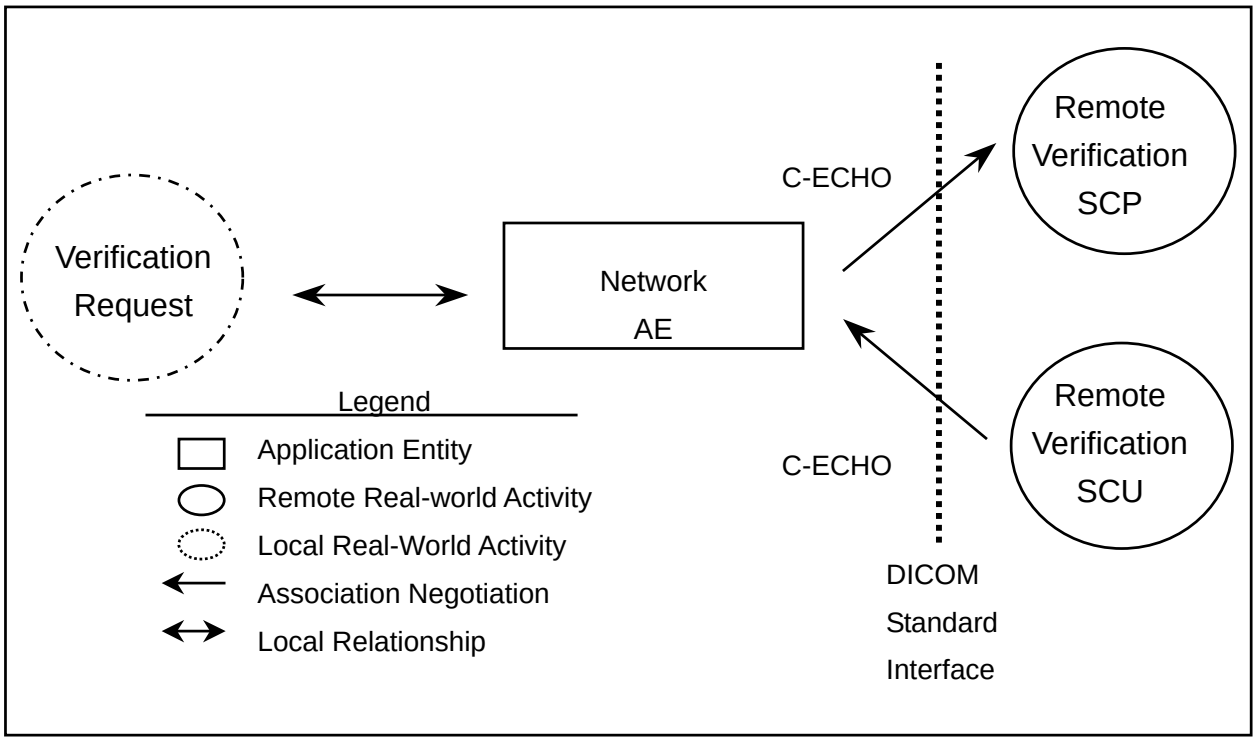

Figure 1

2.1.2 Functional Definitions of Application Entities

Network AE is used to verify that the remote DICOM device is active on the network and allows the remote DICOM device to verify that the Network AE of the

system is active on the network. It therefore performs the following tasks:

- Establishes DICOM association with the remote DICOM device.
- Performs Verification of the presence of the remote DICOM device on the network.
- Accepts establishment of DICOM association from the remote DICOM device.
- Accepts Verification on the network from the remote DICOM device.

2.1.3 Sequence of Real World Activities

2.1.3.1 Features

- Service Engineer requests Verification of activation of the Remote DICOM device.
- Network AE accepts Verification of activation from the Remote DICOM device.
- Network AE is the service class user (SCU) and provider (SCP) for Verification.

2.1.3.2 Operation

Operation 1

Step 1: Select the Remote DICOM device

Step 2: Request verification of activation of the remote DICOM device

Operation 2

Verification SCP is performed automatically when the Remote DICOM device requests the Verification of the presence of Network AEs.

2.2 Storage

Network AE establishes an association for Storage of DICOM Composite Information Objects in the Remote Real World Activity.

2.2.1 Application Data Flow Diagram

Network AE implementation acts as the SCU for the Storage service.

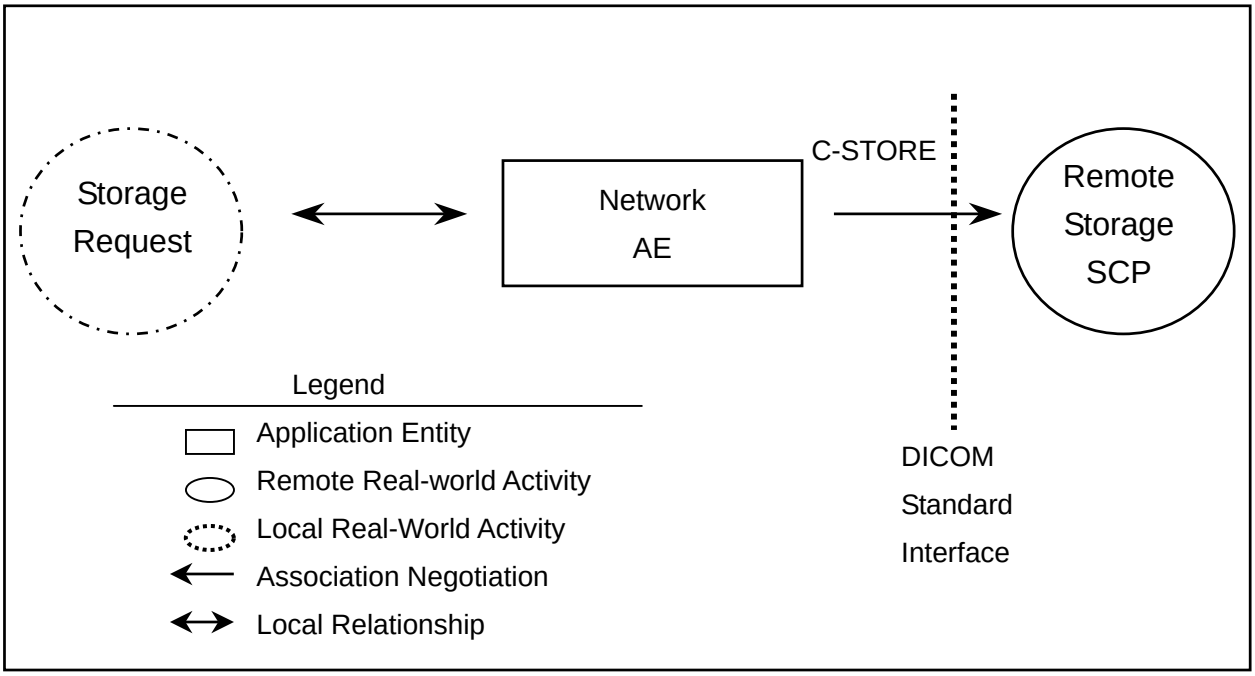

Figure 2

2.2.2 Functional Definitions of Application Entities

Network AE is used to transmit images to a remote DICOM device. It therefore performs the following tasks:

- Builds DICOM SC, US Image and Toshiba Private Data Information Objects
- Establishes DICOM Association with the remote DICOM device
- Stores DICOM SC, US Image and Toshiba Private Data Information Objects on the remote DICOM device

2.2.3 Sequence of Real World Activities

2.2.3.1 Features

- The operator requests transfer of study/images to multiple servers after selecting the target studies from the Study/Image List.
- The operator requests immediate and automatic transfer of images after capture to the default server when the feature is set up in advance.
- Storage requests are placed in a queue and are executed in the background.
- When the study or images transfer fails, Aplio attempts to transfer study or images a particular times set in configuration.
- Network AE acts as the SCU for Storage.

2.2.3.2 Operation

The operations for image transfer are described below:

Operation 1

Step 1: Select the image to be transferred.

Step 2: Request transfer.

Operation 2

Step 1: Select the study to be transferred.

Step 2: Request transfer.

Operation 3

An image is transferred to the Remote DICOM device automatically when the feature is set up in advance.

2.3 Query/Retrieve

Network AE establishes an association for Query and Retrieve of DICOM Composite Information Objects to the Remote Real World Activity. Network AE allows establishment of associations for Storage from the Remote Real World activity.

2.3.1 Application Data Flow Diagram

Network AE implementation acts as the SCU for the Query/Retrieve service.

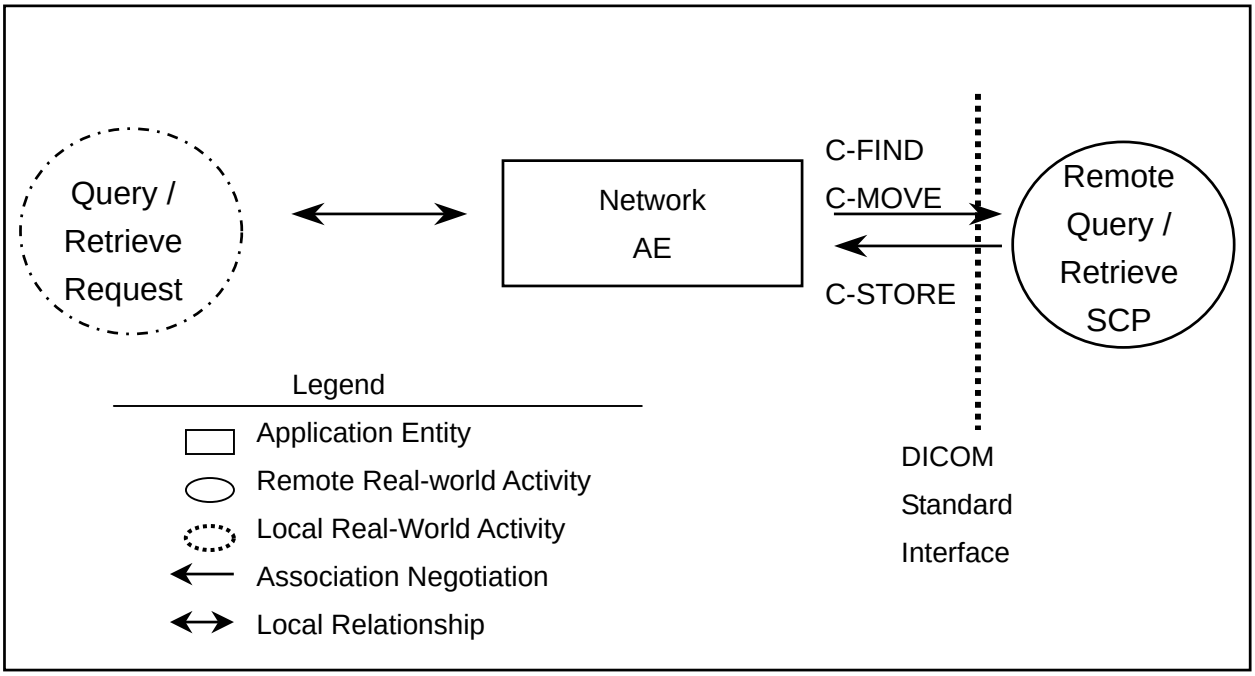

Figure 3

2.3.2 Functional Definitions of Application Entities

Network AE is used to transmit query requests for Patient/Study information and retrieval requests for images from a remote DICOM device. It therefore performs the following tasks:

- Establishes DICOM Association with a remote DICOM device.
- Performs Query of Patient/Study Information Objects from the remote DICOM device.
- Performs Retrieve of DICOM SC, US Image and Toshiba Private Data Information Objects from the remote DICOM device.

2.3.3 Sequence of Real World Activities

2.3.3.1 Features

- The operator requests query of studies.
- The operator requests retrieval of the queried studies from the Study List.
- Patient Name, Patient ID, and Accession Number can be set as a filter.
- When the study or image transfer fails, the operator can manually attempt to query/retrieve studies.
- Network AE acts as the SCU for Query and Retrieve.

2.3.3.2 Operation

The operations for query and transfer of studies are as follows:

Step 1: Indicate a data source

Step 2: Set a filter and query

Step 3: Network AE displays a study list which the remote DICOM device has.

Step 4: Choose and Retrieve of studies from the study list.

2.4 Print

The Print Management Service Classes are an application level class of services which facilitate the printing of images on a hardcopy medium. The print management SCU and print management SCP are peer the Remote Real World Activity. The DICOM print application supports the print management DIMSE services and acts as the SCU.

2.4.1 Application Data Flow Diagram

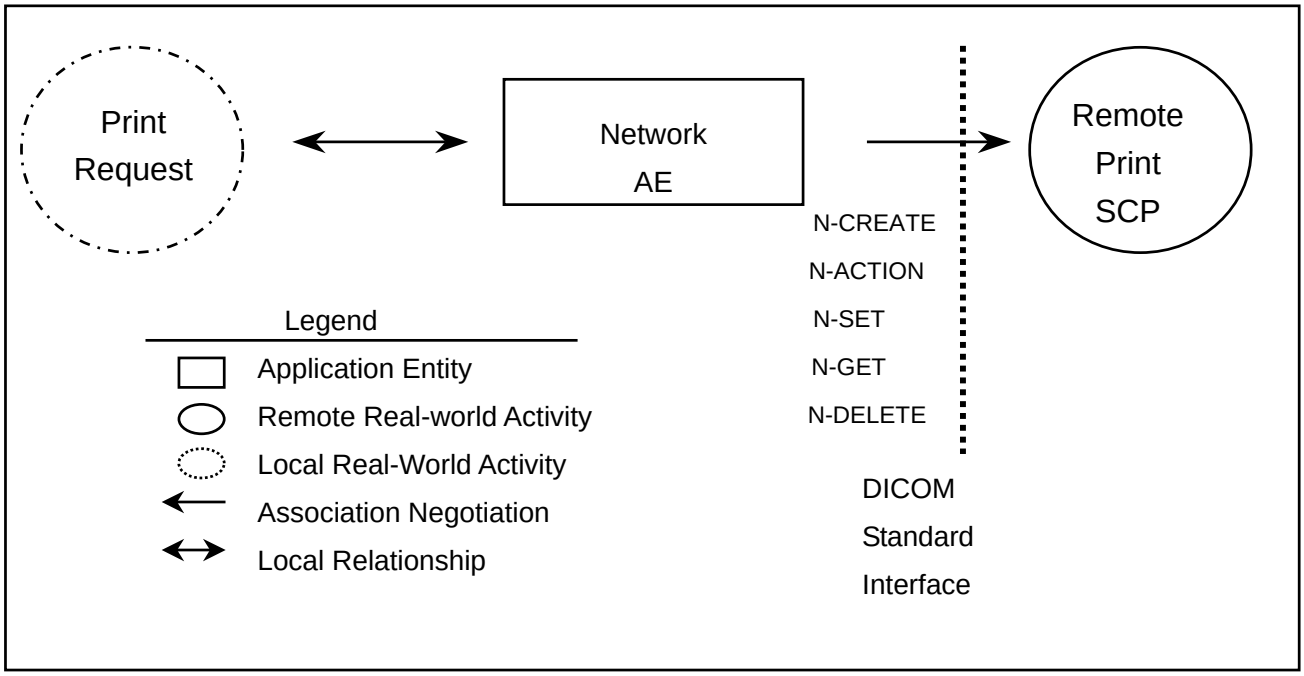

Figure 4

2.4.2 Functional Definitions of Application Entities

Network AE is used to transmit image Print requests to a remote DICOM device. It therefore performs the following tasks:

- Builds DICOM Basic Grayscale and Color Print Objects
- Establishes DICOM Associations with the remote DICOM device
- Transmits DICOM Basic Grayscale and Color Print Objects to the remote DICOM device

2.4.3 Sequence of Real World Activities

2.4.3.1 Features

- The operator requests printing of images after selecting the target

study/images from the study list or the Image List.

- The operator requests printing of image immediate to the default server when the feature is set up in advance.
- The number of rows and columns of frames on each film can be specified as desired.
- Print requests are placed in a queue and are executed in the background.
- When the study or images print fails, Aplio will activate as follows:
  If the error is critical error such as Aplio can not establish an association with the remote DICOM device, it will display print out fails, then the operator can manually attempt.
  If the error is not critical, Aplio attempts to transfer study or images automatically.
- Network AE acts as the SCU for Print.

2.4.3.2 Operation

The operations for printing are described below:

Operation 1

Step 1: Select images or study to be printed.

Step 2: Network AE displays the image to be printed. It can be skipped.

Step 2: Request printing.

Operation 2

An image is transferred to the DICOM printer automatically when the feature is set up in advance.

2.5 Storage Commitment

Network AE establishes an association for Storage Commitment of DICOM Composite Information Objects to the Remote Real World Activity. Network AE allows establishment of associations for commitment from the Remote Real World Activity.

2.5.1 Application Data Flow Diagram

Network AE implementation acts as the SCU for the Storage Commitment service.

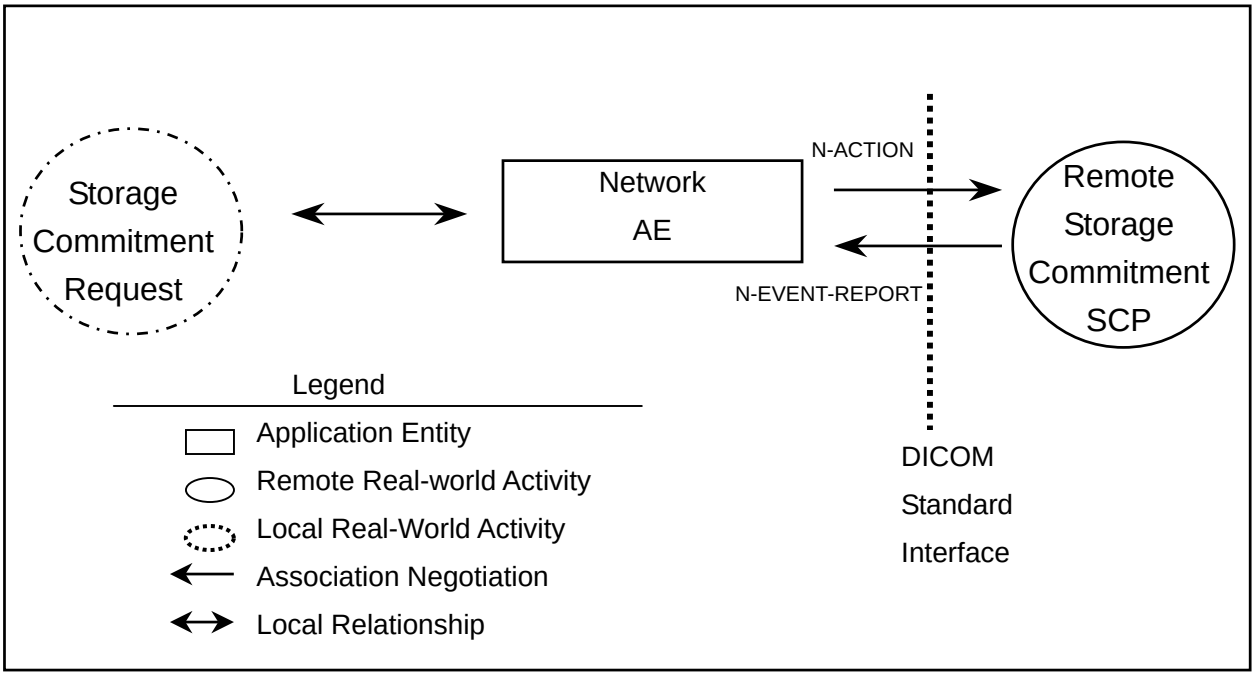

Figure 5

2.5.2 Functional Definitions of Application Entities

Network AE is used to transmit the commitment in a remote DICOM device. It therefore performs the following tasks:

- Establishes DICOM association with the remote DICOM device.
- Sends storage commitment request related to the image.
- Releases the association.
- Establishes DICOM association from the remote DICOM device.
- Waits for storage commitment to confirm commitment of image storage.

- Receives storage commitment.
- Releases the association from the remote DICOM device.

2.5.3 Sequence of Real World Activities

2.5.3.1 Features

- Aplio recognize a procedure fails either a failure of storage or a failure of commitment.
- When the study or image transfer fails, the operator can manually attempt to transfer the study or images.
- Commitment is performed automatically.
- Network AE acts as the SCU for Storage Commitment.

2.5.3.2 Operation

The operations for image transfer are described below:

Operation 1

Step 1: Select the images to be transferred.

Step 2: Request transfer.

Operation 2

Step 1: Select the study to be transferred.

Step 2: Request transfer.

Operation 3

An image is transferred to a remote DICOM device automatically when the feature is set up in advance.

Commitment is performed automatically after the aforementioned operation.

2.6 MWM (Modality Worklist Management)

Network AE establishes an association for MWM of DICOM Composite Information Objects in the Remote Real World Activity.

2.6.1 Application Data Flow Diagram

Network AE implementation acts as the SCU for the MWM service.

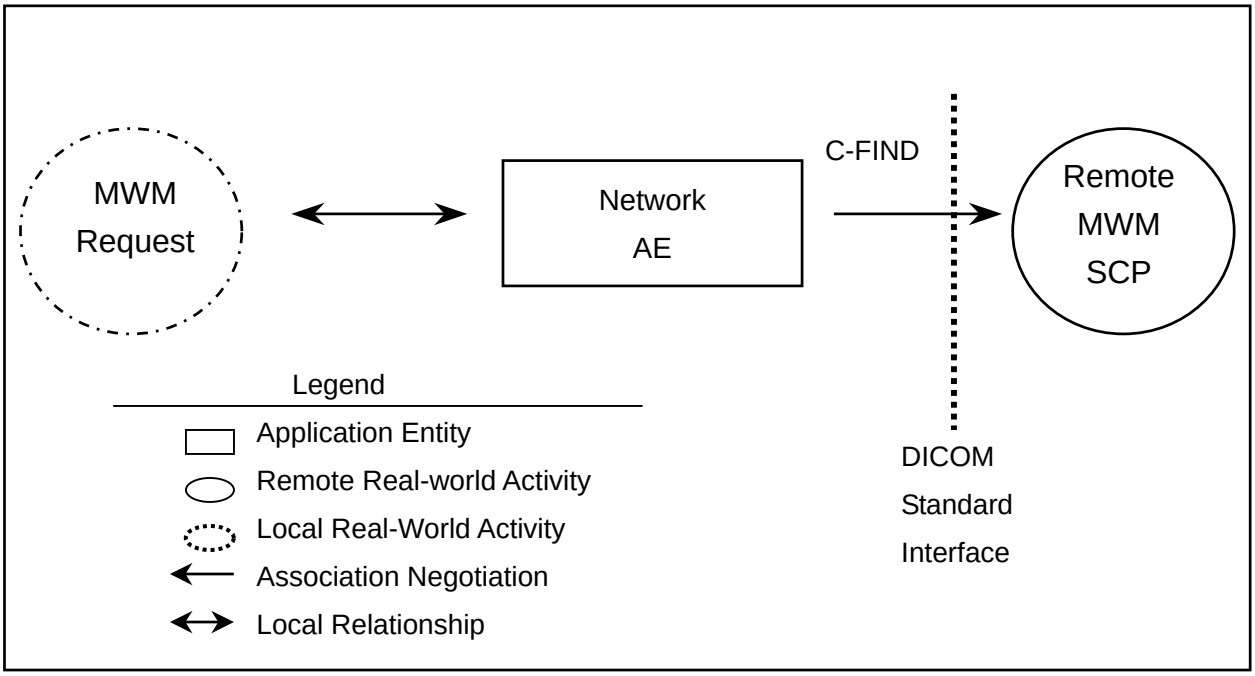

Figure 6

2.6.2 Functional Definitions of Application Entities

Network AE is used to transmit requests for retrieval of MWM information from a remote DICOM device. It therefore performs the following tasks:

- Establishes DICOM association with the remote DICOM device.
- Retrieves DICOM MWM Information from the remote DICOM device.

2.6.3 Sequence of Real World Activities

2.6.3.1 Features

- The operator requests retrieval of MWM information manually.
- When the retrieval fails, the operator can manually attempt to retrieve

MWM information.

- Network AE acts as the SCU for the MWM.

2.6.3.2 Operation

- Query the scheduled study.

2.7 MPPS (Modality Performed Procedure Step)

Network AE establishes an association for MPPS of DICOM Normalized Information Objects in the Remote Real World Activity.

2.7.1 Application Data Flow Diagram

Network AE implementation acts as the SCU for the MPPS service.

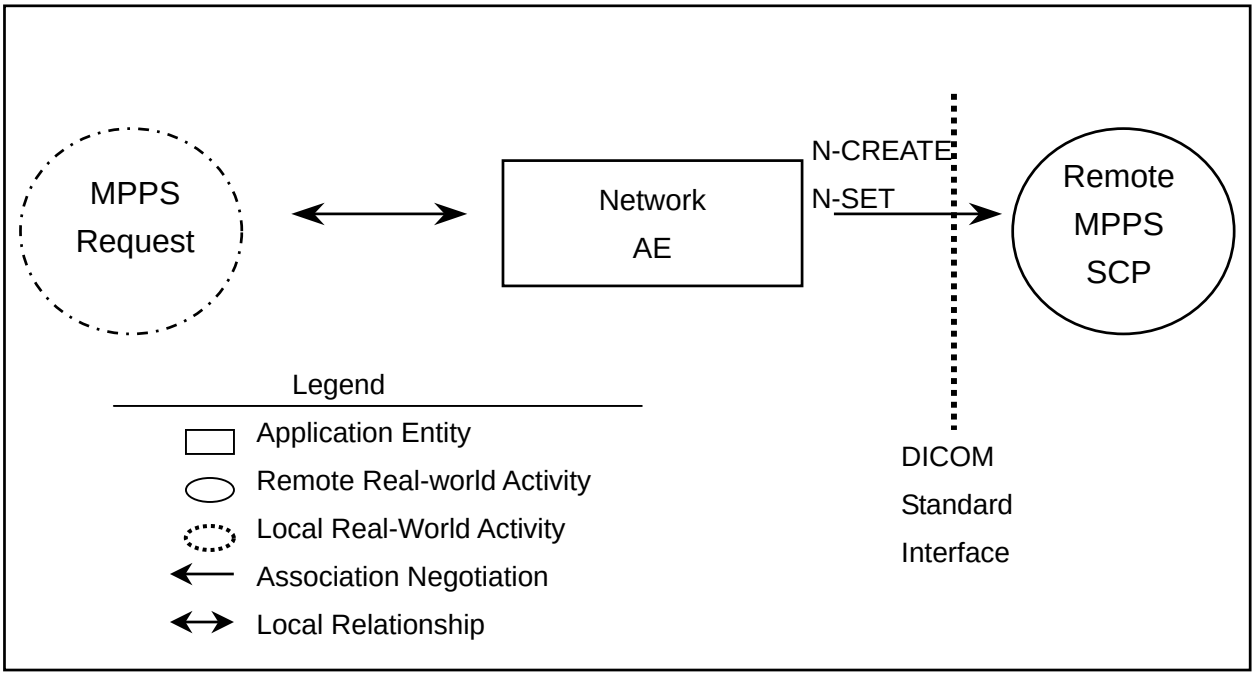

Figure 7

2.7.2 Functional Definitions of Application Entities

Network AE is used to transmit events which are the start and end of a study to a remote DICOM device. It therefore performs the following tasks:

- Establishes DICOM association with the remote DICOM device.
- Informs the remote DICOM device of DICOM MPPS Information.

2.7.3 Sequence of Real World Activities

2.7.3.1 Features

- Network AE transmits events such as the start and end of a study.
- Network AE acts as the SCU for the MPPS.

2.7.3.2 Operation

Network AE performs MPPS functions automatically. The study status is transmitted to a remote DICOM device.

3 AE Specifications

3.1 Network AE Specifications

Network AE (initiation) provides Standard Conformance to the following DICOM SOP Classes as an SCU:

Table 1

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2
Basic Grayscale Print Management	1.2.840.10008.5.1.1.9
Basic Color Print Management	1.2.840.10008.5.1.1.18
Storage Commitment Push Model	1.2.840.10008.1.20.1
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3
Toshiba Private Data Storage	1.2.392.200036.9116.7.8.1.1.1

Network AE (acceptance) provides Standard Conformance to the following DICOM SOP Classes as an SCP:

Table 2

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1

3.1.1 Association Establishment Policies

3.1.1.1 General

The configuration of the DICOM application defines the Application Entity Titles, the port numbers, and of course the host name and net address.
The Application Entity will utilize the following Application Context Name:

Table 3

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1

3.1.1.2 Number of Associations

Network AE (initiation) attempts several associations at a time, one for each transfer request being processed.

Plural simultaneous associations shall not be accepted by Network AE (acceptance).

3.1.1.3 Asynchronous Nature

Network AE (initiation/acceptance) does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.1.4 Implementation Identifying Information

Network AE will specify the following Implementation Identifying Information

Table 4

System	Implementation Class UID	Implementation Version Name
APLIO SSA-770A	1.2.392.200036.9116.7.8.10.46.6.1.1	TM_APLIO_1.0

3.1.2 Association Initiation by Real World Activity

Network AE initiates an association when any of the following activities is chosen by the operator:

- Verification
  Verify that a remote DICOM device is present on the network
- Storage
  Create and store an SC, US image and Toshiba Private Data on a remote DICOM device.
- Query/Retrieve
  Query information from a remote DICOM device.
  Retrieve an SC, US image and Toshiba Private Data from a remote DICOM device.
- Print
  Request printing of an image on a remote DICOM device.
- Storage Commitment
  Create, store, and commit to store an SC, US image and Toshiba Private Data to a remote DICOM device.

- MWM
  Retrieve MWM information from a remote DICOM device.
- MPPS
  Transmit MPPS information to a remote DICOM device

3.1.2.1 Real World Activity - Verification SCU

3.1.2.1.1 Associated Real World Activity

The Associated Real World Activity is a C-ECHO request initiated by the DICOM Service Tool application. If the process successfully establishes an association with a remote Application Entity, it will send the C-ECHO-Request via the open association to verify that the remote Application Entity is responding to DICOM messages.

3.1.2.1.2 Proposed Presentation Contexts

The DICOM application will propose Presentation Contexts as shown in the following table:

Table 5

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
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

3.1.2.1.2.1 SOP Specific Conformance Statement

The Application conforms to the definition of a Verification SCU in accordance with the DICOM Standard.

DIMSE and attributes are described in chapter 8 .

3.1.2.2 Real World Activity - Storage SCU

3.1.2.2.1 Associated Real World Activity

The Associated Real World Activity is a C-STORE request initiated by an internal daemon process. If the process successfully establishes an association with a remote Application Entity, it will transfer images one after another via the open association

3.1.2.2.2 Proposed Presentation Contexts

The DICOM application will propose Presentation Contexts as shown in the following table:

Table 6

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		JPEG Lossy, Baseline Sequential with Huffman Coding (Process1)	1.2.840.10008.1.2.4.50	SCU	None
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	SCU	None

		JPEG Lossy, Baseline Sequential with Huffman Coding (Process1)	1.2.840.10008.1.2.4.50	SCU	None
Toshiba Private Data Storage	1.2.392.200036.9116.7.8.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

3.1.2.2.2.1 SOP Specification Conformance Statement

The Application conforms to the definition of a Storage SCU in accordance with the DICOM Standard.

DIMSE and attributes are described in chapter 9 , and 10 .

3.1.2.3 Real World Activity - Query/Retrieve

3.1.2.3.1 Associated Real World Activity

Network AE will issue a Query request when a user of Network AE wishes to query and retrieve information from a remote DICOM device.

3.1.2.3.2 Proposed Presentation Contexts

Network AE supports the following Presentation Contexts for Query/Retrieve.

Table 7

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

3.1.2.3.2.1 SOP Specific Conformance Statement

The Application conforms to the definition of a Query/Retrieve SCU in accordance with the DICOM Standard.

DIMSE and attributes are described in chapter 11 .

3.1.2.4 Real World Activity – Print SCU

The print management SCU invokes print management DIMSE services to transfer images from Network AE to the remote DICOM device and to print the images with the defined film format and size on a selected network DICOM hardcopy printer (see DICOM part 4, annex H). It provides Standard Conformance to the DICOM V3.0 Basic Grayscale Print Management Meta SOP Class, the Basic Color Print Management Meta SOP Class, and the optional Print Job SOP Class as an SCU:

Basic Gray Scale Print Management Meta SOP Classes

Table 8

SOP Class Name	SOP Class UID
Basic Grayscale Print Management Meta SOP Class	1.2.840.10008.5.1.1.9
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14

Basic Color Print Management Meta SOP Classes

Table 9

SOP Class Name	SOP Class UID
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14

3.1.2.4.1 Associated Real World Activity

The Associated Real World Activity is to print over a network one or more copies of a set of images on a film sheet . The images are converted to “STANDARD\1,1”.

3.1.2.4.2 Proposed Presentation Contexts

Network AE supports the following Presentation Contexts for Print.

Table 10

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Grayscale Print Management Meta SOP	1.2.840.10008.5.1.1.9	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Session SOP	1.2.840.10008.5.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP	1.2.840.10008.5.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Grayscale Image Box SOP	1.2.840.10008.5.1.1.4	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Printer SOP	1.2.840.10008.5.1.1.16	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP	1.2.840.10008.5.1.1.14	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

Table 11

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Basic Color Print Management Meta SOP	1.2.840.10008.5.1.1.18	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Session SOP	1.2.840.10008.5.1.1.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Film Box SOP	1.2.840.10008.5.1.1.2	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Basic Color Image Box SOP	1.2.840.10008.5.1.1.4.1	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Printer SOP	1.2.840.10008.5.1.1.16	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Print Job SOP	1.2.840.10008.5.1.1.14	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.4.2.1 SOP Specific Conformance Statement

The PRINT SCU conforms to the DICOM Basic Grayscale Print Management Meta SOP Class and Basic Color Print Management Meta SOP Class.

Printing is suspended only in the case of a failure return status of the SCP.

DIMSE and attributes are described in chapter 12 .

3.1.2.5 Real World Activity - Storage Commitment SCU

3.1.2.5.1 Associated Real World Activity

Network AE will issue a Storage Commitment request when a user of Network AE wishes to commit storage of studies/images to a remote DICOM device.

3.1.2.5.2 Proposed Presentation Contexts

Network AE supports the following Presentation Contexts for Storage Commitment.

Table 12

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None

3.1.2.5.2.1 SOP Specific Conformance Statement

Network AE conforms to the definition of a Storage Commitment SCU in accordance with the DICOM Standard.

Network AE accepts to confirm storage commitment N-EVENT-REPORT not only per image, but also per study.

DIMSE and attributes are described in chapter 13 .

3.1.2.6 Real World Activity – MWM SCU

3.1.2.6.1 Associated Real World Activity

Network AE will issue a C-FIND request in order to retrieve information for a remote DICOM device.

3.1.2.6.2 Proposed Presentation Contexts

Network AE supports the following Presentation Contexts for MWM.

Table 13

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Extended Negotiation**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Imformation 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	SCU	None

3.1.2.6.2.1 SOP Specific Conformance Statement

The Application conforms to the definition of an MWM SCU in accordance with the DICOM Standard.

DIMSE and attributes are described in chapter 14 .

3.1.2.7 Real World Activity - MPPS SCU

3.1.2.7.1 Associated Real World Activity

Network AE issues MPPS when the study starts and when the study ends.

3.1.2.7.2 Proposed Presentation Contexts

Network AE supports the following Presentation Contexts for MPPS.

Table 14

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.7.2.1 SOP Specific Conformance Statement

The Application conforms to the definition of an MPPS SCU in accordance with the DICOM Standard.

DIMSE and attributes are described in chapter 15 .

3.1.3 Association Acceptance Policy

Network AE accepts passive association at any activation time.

3.1.3.1 Acceptance Real World Activity – Verification SCP

3.1.3.1.1 Associated Real World Activity

The Associated Real World Activity is acceptance to initiate a C-ECHO request from a remote DICOM device.

If the process successfully establishes an association from a remote DICOM device, the C-ECHO response will be sent to it via the open association to verify the Network AE.

3.1.3.1.2 Presentation Context Table

The DICOM application allows establishment of Presentation Contexts as shown in the following table:

Table 15

Presentation Context Table

Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	**UID**	**Name List**	**UID List**		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

4 Communication Profiles

4.1 Supported Communication Stacks

This system provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.2 OSI Stack

Not applicable to this product

4.3 TCP/IP Stack

This application uses the TCP/IP stack from the computer system on which it is executed.

4.3.1 API

Not applicable to this product.

4.3.2 Physical Media Support

This application is independent of the physical medium over which TCP/IP executes; it inherits this from the computer system on which it is executed.

4.3.3 Point-to-Point Stack

Not applicable to this product.

5 Extensions/Specializations/Privatizations

5.1 Standard Extended/Specialized/Private SOPs

5.1.1 Private Elements for Storage SOP Classes

The following private attributes are defined by COMAPL-based DICOM applications.

5.1.1.1 Registry of DICOM Data Elements

Table 16

Tag	Private Owner Code	Name	VR	VM
(0029, xx08)	TOSHIBA MDW HEADER	Image Header Type	CS	1
(0029, xx09)	TOSHIBA MDW HEADER	Image Header Version	LO	1
(0029, xx10)	TOSHIBA MDW HEADER	Image Header Info	OB	1
(0029, xx18)	TOSHIBA MDW HEADER	Series Header Type	CS	1
(0029, xx19)	TOSHIBA MDW HEADER	Series Header Version	LO	1
(0029, xx20)	TOSHIBA MDW HEADER	Series Header Info	OB	1
(0029, xx08)	TOSHIBA COMAPL HEADER	COMAPL Header Type	CS	1
(0029, xx09)	TOSHIBA COMAPL HEADER	COMAPL Header Version	LO	1
(0029, xx10)	TOSHIBA COMAPL HEADER	COMAPL Header Info	OB	1
(0029, xx20)	TOSHIBA COMAPL HEADER	COMAPL History Information	OB	1
(0029, xx31)	PMTF INFORMATION DATA	PMTF Information 1	LO	1
(0029, xx32)	PMTF INFORMATION DATA	PMTF Information 2	UL	1
(0029, xx33)	PMTF INFORMATION DATA	PMTF Information 3	UL	1
(0029, xx34)	PMTF INFORMATION DATA	PMTF Information 4	CS	1
(0029, xx08)	TOSHIBA COMAPL OOG	COMAPL OOG Type	CS	1
(0029, xx09)	TOSHIBA COMAPL OOG	COMAPL OOG Version	LO	1
(0029, xx10)	TOSHIBA COMAPL OOG	COMAPL OOG Info	OB	1

5.1.1.2 All COMAPL Supported Image SOP Classes

5.1.1.2.1 Extended Image IOD Module Table

Table 17

IE	Module	Reference	Usage[*1]	Notes
Patient	Patient	Part 3 C.7.1.1	M	
Study	General Study	Part 3 C.7.2.1	M	
	Patient Study	Part 3 C.7.2.2	U	
Series	General Series	Part 3 C.7.3.1	M	
Equipment	General Equipment	Part 3 C.7.5.1	U	
Image	General Image	Part 3 C.7.6.1	M	
	Image Pixel	Part 3 C.7.6.3	M	
	IOD Specific Modules	Part 3 C.8.<module>	M/U	Depends on the IOD.
	Image Header	5.1.1.2.2	U	
	Series Header	5.1.1.2.3	U	
	COMAPL Header	5.1.1.2.4	U	Private History information
	COMAPL OOG	5.1.1.2.5	U	If object graphics are attached to images
	SOP Common	Part 3 C.12.1	M	

[1] M = Mandatory, C = Conditional, U = User option

5.1.1.2.2 Image Header Module

The table in this section contains private IOD Attributes that describe the Image Header.

Table 18

Attribute Name	Tag	Private Creator	Type	Notes
Image Header Type	(0029, xx08)	TOSHIBA MDW HEADER	1	Image Header identification characteristics.
Image Header Version	(0029, xx09)	TOSHIBA MDW HEADER	3	Version of Image Header Info (0029, xx10) format.
Image Header Info	(0029, xx10)	TOSHIBA MDW HEADER	3	Product dependent information.

5.1.1.2.3 Series Header Module

The table in this section contains private IOD Attributes that describe the Series Header.

Table 19

Attribute Name	Tag	Private Creator	Type	Notes
Series Header Type	(0029, xx18)	TOSHIBA MDW HEADER	1	Series Header identification characteristics.
Series Header Version	(0029, xx19)	TOSHIBA MDW HEADER	3	Version of Series Header Info (0029, xx20) format.
Series Header Info	(0029, xx20)	TOSHIBA MDW HEADER	3	Product dependent information.

5.1.1.2.4 COMAPL Header Module

The table in this section contains private IOD Attributes that describe the TOSHIBA COMAPL HEADER.

Table 20

Attribute Name	Tag	Private Creator	Type	Notes
COMAPL Header Type	(0029, xx08)	TOSHIBA COMAPL HEADER	1C	COMAPL Header identification characteristics. Defined Terms: COMAPL 1 Required if COMAPL Header Info (0029, xx10) present.
COMAPL Header Version	(0029, xx09)	TOSHIBA COMAPL HEADER	2C	Version of COMAPL Header Info (0029, xx10) format. Required if COMAPL Header Info (0029, xx10) present.
COMAPL Header Info	(0029, xx10)	TOSHIBA COMAPL HEADER	3	Manufacturer model dependent information. The value of the attribute COMAPL Header Info (0029, xx10) can be included in each user defined format.
COMAPL History Information	(0029, xx20)	TOSHIBA COMAPL HEADER	3	COMAPL defined Patient Registration history information. See 5.1.1.2.4.1
PMTF Information 1	(0029, xx31)	PMTF INFORMATION DATA	3	Transformation Information
PMTF Information 2	(0029, xx32)	PMTF INFORMATION DATA	3	Transformation Information
PMTF Information 3	(0029, xx33)	PMTF INFORMATION DATA	3	Transformation Information
PMTF Information 4	(0029, xx34)	PMTF INFORMATION DATA	3	Transformation Information

5.1.1.2.4.1 COMAPL History Information

The value of the attribute COMAPL History Information (0029, xx20) is defined as follows:

Table 21

Part	Name	Type	Bytes	Notes
Header	Identifier	String	32	Always "HISTORY"
	Version	String	32	e.g. "V1.10"
> n items	Class Name	String	64	
	Modification String	String	1024	

5.1.1.2.5 COMAPL OOG Module

The table in this section contains private IOD Attributes that describe COMAPL Object Oriented Graphics (OOG). This module is used when object graphics are drawn on the image. The module stores the properties of the graphics objects (line, circle, rectangle, arrow, and so on). Thus the graphics objects retain their relationships with the image even if the image is transferred via the DICOM C-Store SOP class.

Table 22

Attribute Name	Tag	Private Creator	Type	Notes
COMAPL OOG Type	(0029, xx08)	TOSHIBA COMAPL OOG	1	COMAPL Object Oriented Graphics (OOG) identification characteristics. Defined Terms: COMAPL OOG 1
COMAPL OOG Version	(0029, xx09)	TOSHIBA COMAPL OOG	3	Version of COMAPL OOG Info (0029, xx10) format
COMAPL OOG Info	(0029, xx10)	TOSHIBA COMAPL OOG	3	COMAPL Object Oriented Graphics (OOG) data.

The graphics objects are stored in an Image overlay plane for compatibility with products that do not support the COMAPL OOG module. Any system which does not support this COMAPL OOG module has to remove these private attributes when modifying the image overlay data.

6 Configuration

6.1 Configurable Parameters

The service engineer can set and maintain the following configuration parameters for local and remote DICOM device. The parameters are as follows:

Table 23

Parameter			Default
Local	AE Title		aplio
	Port Number		2000
Remote	AE Title		
	Host Name		
	Port Number		
	IP Address		
	Storage	Proposed Transfer Syntax Implicit VR Little Endian/ Explicit VR Little Endian	
		Retry count	3
	Print	Hold printed film jobs	10
		Pixel Size [1/1000 mm]	Depends on the printer.
		Film Sheet Formats	Depends on the printer.
		Number of Pixels [Rows, Columns]	Depends on the printer.
		Medium Type	Depends on the printer.
		Film Destination	Depends on the printer.
		Magnification Type	Replicate
	Commitment	Effect	OFF
	MWM	Query Waiting Time [sec]	60
		Max Query Match Number	200
		Query Interval [sec]	1440
	Q/R	Query effect	OFF
		Retrieve effect	OFF
	MPPS	Effect	OFF
		Retry count	3

7 Support of Extended Character Sets

ISO-IR 100 (Latin alphabet No.1) Supplementary set of ISO8859

8 DIMSE, Attributes, and Criteria - Verification SCU/SCP

8.1 DIMSE - Verification SCU/SCP

Table 24

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Verification	C-ECHO	M	Used

*1: M = Mandatory, C = Conditional, U = User option

9 DIMSE and Attributes - Secondary Capture Image Storage SCU

9.1 DIMSE - Secondary Capture Image Storage SCU

Table 25

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Secondary Capture Image Storage	C-STORE	M	Used

*1: M = Mandatory, C = Conditional, U = User option

9.2 Entity Module Definitions

The information modules for the Ultrasound Workstation are defined below.

Table 26

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	9.3.1	M
Study	General Study Module	9.3.2	M
	Patient Study Module	9.3.3	U
Series	General Series Module	9.3.4	M
Equipment	General Equipment Module	9.3.5	U
	SC Equipment Module	9.3.6	M
Image	General Image Module	9.3.7	M
	Image Pixel Module	9.3.8	M
	SC Image Module	9.3.9	M
	Overlay Plane Module	Not Used	U
	Modality LUT Module	Not Used	U
	VOI LUT Module	9.3.10	U
	SOP Common Module	9.3.11	M

[1] M = Mandatory, C = Conditional, U = User option

9.3 Attributes - Secondary Capture Image Storage SCU

9.3.1 Patient Module

Table 27

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010, 0010)	2	Length = 0 when no entry is made
Patient ID	(0010, 0020)	2	Always set
Patient's Birth Date	(0010, 0030)	2	Length = 0 when no entry is made
Patient's Sex	(0010, 0040)	2	Length = 0 when no entry is made
Patient Comments	(0010, 4000)	3	Length = 0 when no entry is made (“Insurance=” Health Insurance Information <LINE FEED> Additional Patient Information)

9.3.2 General Study Module

Table 28

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020, 000D)	1	Always set
Study Date	(0008, 0020)	2	Length = 0 when no entry is made
Study Time	(0008, 0030)	2	Length = 0 when no entry is made
Referring Physician's Name	(0008, 0090)	2	Length = 0 when no entry is made
Study ID	(0020, 0010)	2	Always set
Accession Number	(0008, 0050)	2	Length = 0 when no entry is made
Study Description	(0008, 1030)	3	Always set
Name of Physician(s) Reading Study	(0008, 1060)	3	Not set when no entry is made

9.3.3 Patient Study Module

Table 29

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnosis Description	(0008, 1080)	3	Always set (Length = 0)
Patient's Age	(0010, 1010)	3	Not set when no entry is made
Patient's Size	(0010, 1020)	3	Not set when no entry is made
Patient's Weight	(0010, 1030)	3	Not set when no entry is made

Additional Patient's History	(0010, 21B0)	3	Not set when no entry is made

9.3.4 General Series Module

Table 30

Attribute Name	Tag	Type	Attribute Description
Modality	(0008, 0060)	1	Always set ("US")
Series Instance UID	(0020, 000E)	1	Always set
Series Number	(0020, 0011)	2	Length = 0 when no entry is made
Series Date	(0008, 0021)	3	Not set when no entry is made
Series Time	(0008, 0031)	3	Not set when no entry is made
Performing Physician's Name	(0008, 1050)	3	Not set when no entry is made
Operator's Name	(0008, 1070)	3	Not set when no entry is made

9.3.5 General Equipment Module

Table 31

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008, 0070)	2	Always set ("TOSHIBA_MEC")
Institution Name	(0008, 0080)	3	Always set
Device Serial Number	(0018, 1000)	3	Always set
Manufacture's Model Name	(0008, 1090)	3	Always set ("SSA-770A")
Software Versions	(0018, 1020)	3	Always set ("V2.00")

9.3.6 SC Equipment Module

Table 32

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008, 0064)	1	Always set "DV" Digitized Video "DI" Digital Interface "DF" Digitized Film "WSD" Workstation

9.3.7 General Image Module

Table 33

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020, 0013)	2	Always set
Patient Orientation	(0020, 0020)	2C	Always set (Length = 0)
Content Date	(0008, 0023)	2C	Always set
Content Time	(0008, 0033)	2C	Always set
Image Type	(0008, 0008)	3	Always set: Value 1: Pixel Data Characteristics “ORIGINAL” or “DERIVED” Value 2: Patient Exam Characteristics “PRIMARY” or “SECONDARY” Value 3: System Defined Term: “US IMAGE” “US 3D IMAGE” (Set when the Secondary Capture image is 3D Screen Shot)
Acquisition Date	(0008, 0022)	3	Always set
Acquisition Time	(0008, 0032)	3	Always set
Image Comments	(0020, 4000)	3	Not set when no entry is made
Lossy Image Compression	(0028, 2110)	3	Not set when no entry is made
Lossy Image Compression Ratio	(0028, 2112)	3	Not set when no entry is made

9.3.8 Image Pixel Module

Table 34

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028, 0002)	1	Always set (3)
Photometric Interpretation	(0028, 0004)	1	Always set (“RGB”)
Rows	(0028, 0010)	1	Always set (600)
Columns	(0028, 0011)	1	Always set (800)
Bits Allocated	(0028, 0100)	1	Always set (8)
Bits Stored	(0028, 0101)	1	Always set (8)
High Bit	(0028, 0102)	1	Always set (7)

Pixel Representation	(0028, 0103)	1	Always set: (0000H: Unsigned integer)
Pixel Data	(7FE0, 0010)	1	Always set
Planar Configuration	(0028, 0006)	1C	Always set (0)

9.3.9 SC Image Module

Table 35

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018, 1012)	3	Not set
Time of Secondary Capture	(0018, 1014)	3	Not set

9.3.10 VOI LUT Module

Table 36

Attribute Name	Tag	Type	Attribute Description
Window Center	(0028, 1050)	3	Always set
Window Width	(0028, 1051)	1C	Always set

9.3.11 SOP Common Module

Table 37

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008, 0016)	1	Always set
SOP Instance UID	(0008, 0018)	1	Always set
Specific Character Set	(0008, 0005)	1C	Always set (“ISO_IR 100”)
Instance Number	(0020, 0013)	3	Not set when no entry is made

10 DIMSE and Attributes - Ultrasound Image Storage SCU

10.1 DIMSE - Ultrasound Image Storage SCU

Table 38

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Ultrasound Image Storage	C-STORE	M	Used

*1: M = Mandatory

10.2 Entity Module Definitions - Ultrasound Image Storage SCU

The information modules for the Ultrasound Workstation are defined below.

Table 39

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	10.3.1	M
Study	General Study Module	10.3.2	M
Study	Patient Study Module	10.3.3	U
Series	General Series Module	10.3.4	M
Frame of Reference	Frame of Reference Module	Not Used	U
Frame of Reference	US Frame of Reference Module	Not Used	C
Equipment	General Equipment Module	10.3.5	M
Image	General Image Module	10.3.6	M
	Image Pixel Module	10.3.7	M
	Palette Color Lookup Table	Not Used	C
	Contrast/bolus Module	Not Used	C
	US Region Calibration Module	10.3.8	U
	US Image Module	10.3.9	M
	Overlay Plane Module	Not Used	U
	VOI LUT Module	10.3.10	U
	SOP Common Module	10.3.11	M
Curve[2]	Curve Identification Module	Not Used	M
	Curve Module	Not Used	M
	Audio Module	Not Used	U
	SOP Common	Not Used	M

[1] M = Mandatory, C = Conditional, U = User option

[2] The Image and Curve IEs are mutually exclusive

10.3 Attributes - Ultrasound Image Storage SCU

10.3.1 Patient Module

Table 40

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010, 0010)	2	Length = 0 when no entry is made
Patient ID	(0010, 0020)	2	Always set
Patient's Birth Date	(0010, 0030)	2	Length = 0 when no entry is made
Patient's Sex	(0010, 0040)	2	Length = 0 when no entry is made
Patient Comments	(0010, 4000)	3	Length = 0 when no entry is made (“Insurance=” Health Insurance Information<LINE FEED> Additional Patient Information)

10.3.2 General Study Module

Table 41

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020, 000D)	1	Always set
Study Date	(0008, 0020)	2	Always set
Study Time	(0008, 0030)	2	Always set
Referring Physician's Name	(0008, 0090)	2	Length = 0 when no entry is made
Study ID	(0020, 0010)	2	Always set
Accession Number	(0008, 0050)	2	Length = 0 when no entry is made
Study Description	(0008, 1030)	3	Always set
Name of Physician(s) Reading Study	(0008,1060)	3	Not set when no entry is made

10.3.3 Patient Study Module

Table 42

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnoses Description	(0008,1080)	3	Always set (Length = 0)
Patient's Age	(0010, 1010)	3	Not set when no entry is made
Patient's Size	(0010, 1020)	3	Not set when no entry is made
Patient's Weight	(0010, 1030)	3	Not set when no entry is made
Additional Patient’s History	(0010, 21B0)	3	Not set when no entry is made

10.3.4 General Series Module

Table 43

Attribute Name	Tag	Type	Attribute Description
Modality	(0008, 0060)	1	Always set (“US”)
Series Instance UID	(0020, 000E)	1	Always set
Series Number	(0020, 0011)	2	Always set
Series Date	(0008, 0021)	3	Not set when no entry is made
Series Time	(0008, 0031)	3	Not set when no entry is made
Performing Physician’s Name	(0008, 1050)	3	Not set when no entry is made
Operator’s Name	(0008, 1070)	3	Not set when no entry is made

10.3.5 General Equipment Module

Table 44

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008, 0070)	2	Always set (“TOSHIBA_MEC”)
Institution Name	(0008, 0080)	3	Always set
Device Serial Number	(0018, 1000)	3	Always set
Manufacturer’s Model Name	(0008, 1090)	3	Always set (“SSA-770A”)
Software Versions	(0018, 1020)	3	Always set (“V2.00”)

10.3.6 General Image Module

Table 45

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020, 0013)	2	Always set
Patient Orientation	(0020,0020)	2C	Always set (Length = 0)
Content Date	(0008, 0023)	2C	Always set
Content Time	(0008, 0033)	2C	Always set
Image Type	(0008, 0008)	3	Always set: Value 1: Pixel Data Characteristics “ORIGINAL” or “DERIVED” Value 2: Patient Exam Characteristics “PRIMARY” or

			"SECONDARY" Value 3: System Defined Term: "US IMAGE" Value 4: Standard Defined Terms: 0001 = 2D Imaging 0002 = M-Mode 0004 = CW Doppler 0008 = PW Doppler 0010 = Color Doppler 0020 = Color M-Mode 0040 = 3D Rendering Aforementioned Values may be combined.
Acquisition Date	(0008, 0022)	3	Always set
Acquisition Time	(0008, 0032)	3	Always set
Image Comments	(0020, 4000)	3	Not set when no entry is made
Lossy Image Compression	(0028, 2110)	3	Not set when no entry is made
Lossy Image Compression Ratio	(0028, 2112)	3	Not set when no entry is made

10.3.7 Image Pixel Module

Table 46

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028, 0002)	1	Always set (3)
Photometric Interpretation	(0028, 0004)	1	Always set ("RGB")
Rows	(0028, 0010)	1	Always set (537)
Columns	(0028, 0011)	1	Always set (716)
Bits Allocated	(0028, 0100)	1	Always set (8)
Bits Stored	(0028, 0101)	1	Always set (8)
High Bit	(0028, 0102)	1	Always set (7)
Pixel Representation	(0028, 0103)	1	Always set (0): Unsigned Integer
Pixel Data	(7FE0, 0010)	1	Always set
Planar Configuration	(0028, 0006)	1C	Always set (0)

10.3.8 US Region Calibration Module

10.3.8.1 US Region Calibration Module B-mode

Table 47

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018, 6011)	1	Always set
>Region Location Min x0	(0018, 6018)	1	Always set
>Region Location Min y0	(0018, 601A)	1	Always set
>Region Location Max x1	(0018, 601C)	1	Always set
>Region Location Max y1	(0018, 601E)	1	Always set
>Physical Units X Direction	(0018, 6024)	1	Always set
>Physical Units Y Direction	(0018, 6026)	1	Always set
>Physical Delta X	(0018, 602C)	1	Always set
>Physical Delta Y	(0018, 602E)	1	Always set
>Region Spatial Format	(0018, 6012)	1	Always set
>Region Data Type	(0018, 6014)	1	Always set
>Region Flags	(0018, 6016)	1	Always set
>Transducer Frequency	(0018, 6030)	3	Always set

10.3.8.2 US Region Calibration Module BC-mode

Table 48

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018, 6011)	1	Always set
>Region Location Min x0	(0018, 6018)	1	Always set
>Region Location Min y0	(0018, 601A)	1	Always set
>Region Location Max x1	(0018, 601C)	1	Always set
>Region Location Max y1	(0018, 601E)	1	Always set
>Physical Units X Direction	(0018, 6024)	1	Always set
>Physical Units Y Direction	(0018, 6026)	1	Always set

>Physical Delta X	(0018, 602C)	1	Always set
>Physical Delta Y	(0018, 602E)	1	Always set
>Region Spatial Format	(0018, 6012)	1	Always set
>Region Data Type	(0018, 6014)	1	Always set
>Region Flags	(0018, 6016)	1	Always set
>Transducer Frequency	(0018, 6030)	3	Always set
>Pulse Repetition Frequency	(0018, 6032)	3	Always set

10.3.8.3 US Region Calibration Module D-mode

Table 49

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018, 6011)	1	Always set
>Region Location Min x0	(0018, 6018)	1	Always set
>Region Location Min y0	(0018, 601A)	1	Always set
>Region Location Max x1	(0018, 601C)	1	Always set
>Region Location Max y1	(0018, 601E)	1	Always set
>Physical Units X Direction	(0018, 6024)	1	Always set
>Physical Units Y Direction	(0018, 6026)	1	Always set
>Physical Delta X	(0018, 602C)	1	Always set
>Physical Delta Y	(0018, 602E)	1	Always set
>Region Spatial Format	(0018, 6012)	1	Always set
>Region Data Type	(0018, 6014)	1	Always set
>Region Flags	(0018, 6016)	1	Always set
>Transducer Frequency	(0018, 6030)	3	Always set
>Pulse Repetition Frequency	(0018, 6032)	3	Always set
>Doppler Correction Angle	(0018, 6034)	3	Always set

>Steering Angle	(0018, 6036)	3	Always set

10.3.8.4 US Region Calibration Module M-mode

Table 50

Attribute Name	Tag	Type	Attribute Description
Sequence of Ultrasound Regions	(0018, 6011)	1	Always set
>Region Location Min x0	(0018, 6018)	1	Always set
>Region Location Min y0	(0018, 601A)	1	Always set
>Region Location Max x1	(0018, 601C)	1	Always set
>Region Location Max y1	(0018, 601E)	1	Always set
>Physical Units X Direction	(0018, 6024)	1	Always set
>Physical Units Y Direction	(0018, 6026)	1	Always set
>Physical Delta X	(0018, 602C)	1	Always set
>Physical Delta Y	(0018, 602E)	1	Always set
>Region Spatial Format	(0018, 6012)	1	Always set
>Region Data Type	(0018, 6014)	1	Always set
>Region Flags	(0018, 6016)	1	Always set
>Transducer Frequency	(0018, 6030)	3	Always set

10.3.9 US Image Module

Table 51

Attribute Name	Tag	Type	Attribute Description
Sample Per Pixel	(0028, 0002)	1	Always set (3)
Photometric Interpretation	(0028, 0004)	1	Always set (“RGB”)
Bits Allocated	(0028,0100)	1	Always set (8)
Bits Stored	(0028, 0101)	1	Always set (8)
High Bit	(0028, 0102)	1	Always set (7)
Planar Configuration	(0028, 0006)	1	Always set (0)

Pixel Representation	(0028, 0103)	1	Always set (0)
Image Type	(0008, 0008)	2	Always set: Value 1: Pixel Data Characteristics “ORIGINAL” or “DERIVED” Value 2: Patient Exam Characteristics “PRIMARY” or “SECONDARY” Value 3: System Defined Term: “US IMAGE” Value 4: Standard Defined Terms: 0001 = 2D Imaging 0002 = M-Mode 0004 = CW Doppler 0008 = PW Doppler 0010 = Color Doppler 0020 = Color M-Mode 0040 = 3D Rendering Aforementioned values may be combined.
Lossy Image Compression	(0028, 2110)	1C	Always set
Ultrasound Color Data Present	(0028, 0014)	3	Always set (1)
Heart Rate	(0018, 1088)	3	Not set when no entry is made. Beat per minute.
Transducer Type	(0018, 6031)	3	Always set Defined Terms: “SECTOR_PHASED” “LINEAR” “CURVED LINEAR” “VECTOR_PHASED”

10.3.10 VOI LUT Module

Table 52

Attribute Name	Tag	Type	Attribute Description
Window Center	(0028, 1050)	1C	Always set
Window Width	(0028, 1051)	1C	Always set

10.3.11 SOP Common Module

Table 53

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008, 0016)	1	Always set
SOP Instance UID	(0008, 0018)	1	Always set
Specific Character Set	(0008, 0005)	1C	Always set (“ISO_IR 100”)
Instance Number	(0020, 0013)	3	Not set when no entry is made

11 DIMSE and Attributes - Query/Retrieve SCU

11.1 DIMSE - Query/Retrieve SCU

Table 54

SOP Class	DIMSE Service Element	Usage SCU	Usage
Study Root Query/Retrieve Information Model - FIND SOP Class	C-FIND	M	Used
	C-FIND CANCEL	M	Used
Study Root Query/Retrieve Information Model - MOVE SOP Class	C-MOVE	M	Used
	C-MOVE CANCEL	M	Used

11.2 Study Root Query/Retrieve Information Model - Find

11.2.1 Study Level SCU Request

Table 55

Attribute Name	Tag	Type	User Input	Matching
Study Date	(0008, 0020)	R	Cannot be used as a filter	Universal
Study Time	(0008, 0030)	R	Cannot be used as a filter	Universal
Accession Number	(0008, 0050)	R	Can be used as a filter	Wildcard
Study Description	(0008, 1030)	O	Cannot be used as a filter	Universal
Patient's Name	(0010, 0010)	R	Can be used as a filter	Wildcard
Patient ID	(0010, 0020)	R	Can be used as a filter	Wildcard
Patient's Birth Date	(0010, 0030)	O	Cannot be used as a filter	Universal
Patient's Sex	(0010, 0040)	O	Cannot be used as a filter	Universal
Study ID	(0020, 0010)	R	Cannot be used as a filter	Universal
Study Instance UID	(0020, 000D)	U	Cannot be used as a filter	Universal

11.2.2 Series Level SCU Request

Table 56

Attribute Name	Tag	Type	User Input	Matching
Series Date	(0008, 0021)	O	Cannot be used as a filter	Universal
Series Time	(0008, 0031)	O	Cannot be used as a filter	Universal
Modality	(0008, 0060)	R	Cannot be used as a filter	Universal
Series Description	(0008, 103E)	O	Cannot be used as a filter	Universal
Series Instance UID	(0020, 000E)	U	Cannot be used as a filter	Universal
Series Number	(0020, 0011)	R	Cannot be used as a filter	Universal

11.2.3 Composite Object Instance Level SCU Request

Table 57

Attribute Name	Tag	Type	User Input	Matching
SOP Instance UID	(0008, 0018)	U	Cannot be used as a filter	Universal
Instance Number	(0020, 0013)	R	Cannot be used as a filter	Universal

12 DIMSE and Attributes – Print SCU

12.1 DIMSE - Print SCU

Table 58

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Basic Film Session SOP Class	N-CREATE	M	12.2.1.1
	N-DELETE	U	Used
Basic Film Box SOP Class	N-CREATE	M	12.2.2.1
	N-ACTION	M	Used
	N-DELETE	U	Used
Basic Grayscale Image Box SOP Class	N-SET	M	12.2.3.1
Basic Color Image Box SOP Class	N-SET	M	12.2.4.1
Printer SOP Class	N-EVENT-REPORT	M	12.2.5.1
	N-GET	U	
Print Job SOP Class	N-EVENT-REPORT	M	12.2.6

*1: M = Mandatory, C = Conditional, U = User option

12.2 Attributes- Print SCU

12.2.1 Attributes - Basic Film Session SOP Class

12.2.1.1 Attributes - N-CREATE

Table 59

Attribute Name	Tag	Usage	Attribute Description
Number of Copies	(2000, 0010)	U	Always set
Medium Type	(2000, 0030)	U	Always set “BLUE FILM”, “CLEAR FILM”, or “PAPER”
Film Destination	(2000, 0040)	U	Always set “MAGAZINE” or “PROCESSOR”

12.2.2 Attributes - Basic Film BOX SOP Class

12.2.2.1 Attributes – N-CREATE

Table 60

Attribute Name	Tag	Usage	Attribute Description
Image Display Format	(2010, 0010)	M	Always set (“STANDARD\1,1”)
Film Orientation	(2010, 0040)	U	Always set (“PORTRAIT”)
Film Size ID	(2010, 0050)	U	Always set (“8INX10IN”, “10INX12IN”, “10INX14IN”, “11INX14IN”, “14INX14IN”, “14INX17IN”, “24CMX24CM”, or “24CMX30CM”)
Magnification Type	(2010, 0060)	U	Always set
Min Density	(2010, 0120)	U	Always set
Max Density	(2010, 0130)	U	Always set
Referenced Film Session Sequence	(2010, 0500)	M	Always set
>Referenced SOP Class UID	(0008, 1150)	M	1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	(0008, 1155)	M	Always set

12.2.3 Attributes - Basic Grayscale Image Box SOP Class

12.2.3.1 Attributes – N-SET

Table 61

Attribute Name	Tag	Usage	Attribute Description
Image Position	(2020, 0010)	M	Always set (1)
Basic Grayscale Image Sequence	(2020, 0110)	M	Always set
>Samples Per Pixel	(0028, 0002)	M	Always set (1)
>Photometric Interpretation	(0028, 0004)	M	Always set (“MONOCHROME2”)
>Rows	(0028, 0010)	M	Always set
>Columns	(0028, 0011)	M	Always set
>Pixel Aspect Ratio	(0028, 0034)	MC	Always set
>Bits Allocated	(0028, 0100)	M	Always set (8)
>Bits Stored	(0028, 0101)	M	Always set (8)
>High Bit	(0028, 0102)	M	Always set (7)

>Pixel Representation	(0028, 0103)	M	Always set (0)
>Pixel Data	(7FE0, 0010)	M	Always set

12.2.4 Attributes - Basic color Image Box SOP Class

12.2.4.1 Attributes - N-SET

Table 62

Attribute Name	Tag	Usage	Attribute Description
Image Position	(2020, 0010)	M	Always set (1)
Basic Color Image Sequence	(2020, 0111)	M	Always set
>Samples Per Pixel	(0028, 0002)	M	Always set (3)
>Photometric Interpretation	(0028, 0004)	M	Always set (RGB)
>Planar Configuration	(0028, 0006)	M	Always set (0)
>Rows	(0028, 0010)	M	Always set
>Columns	(0028, 0011)	M	Always set
>Pixel Aspect Ratio	(0028, 0034)	MC	Always set
>Bits Allocated	(0028, 0100)	M	Always set (8)
>Bits Stored	(0028, 0101)	M	Always set (8)
>High Bit	(0028, 0102)	M	Always set (7)
>Pixel Representation	(0028, 0103)	M	Always set (0)
>Pixel Data	(7FE0, 0010)	M	Always set

12.2.5 Attributes - Printer SOP Class

Table 63

Event Type Name	Event	Attributes	Tag	Usage
Normal	1	Printer Status Info	(2110, 0020)	U
Warning	2	Printer Status Info	(2110, 0020)	U
Failure	3	Printer Status Info	(2110, 0020)	U

12.2.5.1 Attributes - N-GET/N-EVENT-REPORT

Table 64

Attribute name	Tag	Usage	Attribute Descriptions
Printer Status	(2110, 0010)	M	“NORMAL”, “FAILURE”, or “WARNING”
Printer Status Info	(2110, 0020)	M	“SUPPLY EMPTY *[a]”,

			“SUPPLY LOW”, “RECEIVER FULL”, “NO RECEIVE MAGAZINE”, or “FILM JAM”

*a: Only valid in case of Printer Status WARNING.

12.2.6 Attributes - Print JOB SOP Class

Table 65

Event Type Name	Event	Attribute Name	Tag	Usage
Pending	1	Execution Status Info	(2100, 0030)	U
		Print Job ID	(2100, 0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000, 0050)	U
		Printer Name	(2110, 0030)	U
Printing	2	Execution Status Info	(2100, 0030)	U
		Print Job ID	(2100, 0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000, 0050)	U
		Printer Name	(2110, 0030)	U
Done	3	Execution Status Info	(2100, 0030)	U
		Print Job ID	(2100, 0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000, 0050)	U
		Printer Name	(2110, 0030)	U
Failure	4	Execution Status Info	(2100, 0030)	U
		Print Job ID	(2100, 0010)	(Print Queue Management SOP Class not supported)
		Film Session Label	(2000, 0050)	U
		Printer Name	(2110, 0030)	U

12.3 Return Status Criterion – Print SCU

The time out values for each DIMSE are as follows:

Table 66

DIMSE	Time Out Values
N-CREATE	60 sec
N-DELETE	60 sec
N-ACTION	240 sec
N-SET	240 sec

13 DIMSE and Attributes - Storage Commitment SCU

13.1 DIMSE - Storage Commitment SCU

Table 67

SOP Class	DIMSE Service Element	Reference	Usage SCU
Storage Commitment Push Model SOP Class	N-ACTION	13.2.1	M
	N-EVENT-REPORT	13.2.2	M

13.2 Attributes - Storage Commitment PUSH MODEL SOP CLASS

13.2.1 Attributes - N-ACTION

Table 68

Action type Name	Action Type ID	Attribute Name	Tag	Requirement Type SCU
Request Storage Commitment	1	Transaction UID	(0008, 1195)	1
		Referenced SOP Sequence	(0008, 1199)	1
		> Referenced SOP Class UID	(0008, 1150)	1
		> Referenced SOP Instance UID	(0008, 1155)	1

13.2.2 Attributes - N-EVENT-REPORT

Table 69

Event Type Name	Event Type ID	Attribute Name	Tag	Requirement Type SCP
Storage Commitment Request Successful	1	Transaction UID	(0008, 1195)	1
		Referenced SOP Sequence	(0008, 1199)	1
		> Referenced SOP Class UID	(0008, 1150)	1
		> Referenced SOP Instance UID	(0008, 1155)	1
Storage Commitment Request Complete Failure Exist	2	Transaction UID	(0008, 1195)	1
		Referenced SOP Sequence	(0008, 1199)	1
		> Referenced SOP Class UID	(0008, 1150)	1
		> Referenced SOP Instance UID	(0008, 1155)	1

14 DIMSE and Attributes – MWM SCU

14.1 DIMSE – MWM SCU

Table 70

SOP Class	DIMSE Service Element	Usage SCU *1	Usage
Modality Worklist Information Model-FIND	C-FIND	M	Used

*1: M = Mandatory

14.2 Attributes -MWM

14.2.1 Matching Key Attributes

14.2.1.1 Scheduled Procedure Step Module

Table 71

Description/Module	Tag	Matching Key Type	Remarks/Matching Type
Scheduled Procedure Step Sequence	(0040, 0100)	R	
>Scheduled Procedure Step Start Date	(0040, 0002)	R	Range matching only
>Scheduled Procedure Step Start Time	(0040, 0003)	R	Range matching only
>Modality	(0008, 0060)	R	Single value matching only

14.2.2 Return Key Attributes

The supported Return Key Attributes are listed below.

14.2.2.1 SOP Common Module

Table 72

Description/Module	Tag	Return Key Type	Remarks
Specific Character Set	(0008, 0005)	1C	

14.2.2.2 Scheduled Procedure Step Module

Table 73

Description/Module	Tag	Return Key Type	Remarks
Scheduled Procedure Step Sequence	(0040, 0100)	1	
>Modality	(0008, 0060)	1	
>Requested Contrast Agent	(0032, 1070)	2C	
>Scheduled Station AE Title	(0040, 0001)	1	
>Scheduled Procedure Step Start Date	(0040, 0002)	1	
>Scheduled Procedure Step Start Time	(0040, 0003)	1	
>Scheduled Procedure Step End Date	(0040, 0004)	3	
>Scheduled Procedure Step End Time	(0040, 0005)	3	
>Scheduled Performing Physician's Name	(0040, 0006)	1	
>Scheduled Procedure Step Description	(0040, 0007)	1C	
>Scheduled Action Item Code Sequence	(0040, 0008)	1C	
>>Code Value	(0008, 0100)	1C	
>>Coding Scheme Designator	(0008, 0102)	1C	
>>Code Meaning	(0008, 0104)	3	
>Scheduled Procedure Step ID	(0040, 0009)	1	

>Scheduled Station Name	(0040, 0010)	2	
>Scheduled Procedure Step Location	(0040, 0011)	2	
>Pre-Medication	(0040, 0012)	2C	
>Comments on the Scheduled Procedure Step	(0040, 0400)	3	
Specific Character Set	(0008, 0005)	1C	

14.2.2.3 Requested Procedure Module

Table 74

Description/Module	Tag	Return key Type	Remarks
Referenced Study Sequence	(0008, 1110)	2	
>Referenced SOP Class UID	(0008, 1150)	1C	
>Referenced SOP Instance UID	(0008, 1155)	1C	
Study Instance UID	(0020, 000D)	1	
Requested Procedure Description	(0032, 1060)	1C	
Requested Procedure Code Sequence	(0032, 1064)	1C	
>Code Value	(0008, 0100)	1C	
>Code Scheme Designator	(0008, 0102)	1C	
>Code Meaning	(0008, 0104)	3	
Requested Procedure ID	(0040, 1001)	1	
Requested Procedure Priority	(0040, 1003)	2	
Patient Transport Arrangements	(0040, 1004)	2	
Reason for the Requested Procedure	(0040, 1002)	3	
Placer Order Number/Procedure	(0040, 1006)	3	
Filler Order Number/Procedure	(0040, 1007)	3	
Confidentiality Code	(0040, 1008)	3	
Reporting Priority	(0040, 1009)	3	
Names of Intended Recipients of Results	(0040, 1010)	3	
Requested Procedure Comments	(0040, 1400)	3	
Requested Procedure Location	(0040, 1005)	3	

14.2.2.4 Imaging Service Request Module

Table 75

Description/Module	Tag	Return Key Type	Remarks
Accession Number	(0008, 0050)	2	
Referring Physician's Name	(0008, 0090)	2	
Requesting Physician	(0032, 1032)	2	
Requesting Service	(0032, 1033)	3	
Reason for the Imaging Service Request	(0040, 2001)	3	
Issuing Date of Imaging Service Request	(0040, 2004)	3	
Issuing Time of Imaging Service Request	(0040, 2005)	3	
Placer Order Number/Imaging Service Request	(0040, 2006)	3	
Filler Order Number/Imaging Service Request	(0040, 2007)	3	
Order Entered By...	(0040, 2008)	3	
Order Enterer's Location	(0040, 2009)	3	
Order Callback Phone Number	(0040, 2010)	3	
Imaging Service Request Comments	(0040, 2400)	3	

14.2.2.5 Visit Identification Module

Table 76

Description/Module	Tag	Return Key Type	Remarks
Admission ID	(0038, 0010)	2	

14.2.2.6 Visit Status Module

Table 77

Description/Module	Tag	Return Key Type	Remarks
Current Patient Location	(0038, 0300)	2	
Patient's Institution Residence	(0038, 0400)	3	

14.2.2.7 Visit Relationship Module

Table 78

Description/Module	Tag	Return Key Type	Remarks
Referenced Patient Sequence	(0008, 1120)	2	
>Referenced SOP Class UID	(0008, 1150)	2	
>Referenced SOP Instance UID	(0008, 1155)	2	

14.2.2.8 Patient Identification Step Module

Table 79

Description/Module	Tag	Return Key Type	Remarks
Patient's Name	(0010, 0010)	1	
Patient ID	(0010, 0020)	1	.

14.2.2.9 Patient Demographic Module

Table 80

Description/Module	Tag	Return Key Type	Remarks
Patients Birth Date	(0010, 0030)	2	
Patient's Sex	(0010, 0040)	2	
Patient's Weight	(0010, 1030)	2	
Confidentiality Constraint on Patient Data	(0040, 3001)	2	

14.2.2.10 Patient Medical Module

Table 81

Description/Module	Tag	Return Key Type	Remarks
Medical Alerts	(0010, 2000)	2	
Contrast Allergies	(0010, 2110)	2	
Pregnancy Status	(0010, 21C0)	2	
Special Needs	(0038, 0050)	2	
Patient State	(0038, 0500)	2	

15 DIMSE and Attributes – MPPS SCU

15.1 DIMSE – MPPS SCU

Table 82

SOP Class	DIMSE Service Element	Reference	Usage SCU *1	Usage
Modality Performed Procedure Step SOP Class	N-CREATE	15.2.1	M	Used
	N-SET	15.2.2	M	Used

*1: M = Mandatory

15.2 Modality Performed Procedure Step SOP Class

15.2.1 N-CREATE Attributes

15.2.1.1 SOP Common Module

Table 83

Description/Module	Tag	Request Type	Remarks
Specific Character Set	(0008, 0005)	1C	

15.2.1.2 Relationship Module

Table 84

Description/Module	Tag	Request Type	Remarks
Patient's Name	(0010, 0010)	2	
Patient ID	(0010, 0020)	2	
Patient's Birth Date	(0010, 0032)	2	
Patient's Sex	(0010, 0040)	2	
Referenced Patient Sequence	(0008, 1120)	2	
>Referenced SOP Class UID	(0008, 1150)	1C	
>Referenced Instance UID	(0008, 1155)	1C	
Scheduled Step Attribute Sequence	(0040, 0270)	1	
>Study Instance UID	(0020, 000D)	1	
>Referenced Study Sequence	(0008, 1110)	2	
>Accession Number	(0008, 0050)	2	
>Requested Procedure ID	(0040, 1001)	2	
>Requested Procedure Description	(0032, 1060)	2	

>Scheduled Procedure Step ID	(0040, 0009)	2	
>Scheduled Procedure Step Description	(0040, 0007)	2	
>Scheduled Action Item Code Sequence	(0040, 0008)	2	

15.2.1.3 Information Module

Table 85

Description/Module	Tag	Request Type	Remarks
Performed Station AE Title	(0040, 0241)	1	
Performed Station Name	(0040, 0242)	2	
Performed Location	(0040, 0243)	2	
Performed Procedure Step Start Date	(0040, 0244)	1	
Performed Procedure Step Start Time	(0040, 0245)	1	
Performed Procedure Step End Date	(0040, 0250)	2	
Performed Procedure Step End Time	(0040, 0251)	2	
Performed Procedure Step Status	(0040, 0252)	1	
Performed Procedure Step ID	(0040, 0253)	1	
Performed Procedure Step Description	(0040, 0254)	2	
Performed Procedure Type Description	(0040, 0255)	2	
Procedure Code Sequence	(0008, 1032)	2	

15.2.1.4 Image Acquisition results Module

Table 86

Description/Module	Tag	Request Type	Remarks
Modality	(0008, 0060)	1	
Study ID	(0020, 0010)	2	
Performed Action Item Code Sequence	(0040, 0260)	2	
Performed Series Sequence	(0040, 0340)	2	
>Performing Physician’s Name	(0008, 1050)	2C	
>Operator’s Name	(0008, 1070)	2C	
>Protocol Name	(0018, 1030)	1C	
>Series Instance UID	(0020, 000E)	1C	
>Series Description	(0008, 103E)	2C	
>Retrieve AE Title	(0008, 0054)	2C	
>Referenced Image Sequence	(0008, 1140)	2C	
>Referenced Standalone SOP Instance Sequence	(0040, 0220)	2C	

15.2.2 N-SET Attribute

15.2.2.1 Information Module

Table 87

Description/Module	Tag	Request Type	Requirement Type Final Status
Performed Procedure Step End Date	(0040, 0250)	3	1
Performed Procedure Step End Time	(0040, 0251)	3	1
Performed Procedure Step Status	(0040, 0252)	3	
Performed Procedure Step Description	(0040, 0254)	3	
Performed Procedure Type Description	(0040, 0255)	3	
Procedure Code Sequence	(0008, 1032)	3	

15.2.2.2 Image Acquisition results Module

Table 88

Description/Module	Tag	Request Type	Requirement Type Final Status
Performed Action Item Code Sequence	(0040, 0260)	3	
Performed Series Sequence	(0040, 0340)	3	1
>Performing Physician's Name	(0008, 1050)	2C	2
>Operator's Name	(0008, 1070)	2C	2
>Protocol Name	(0018, 1030)	1C	1
>Series Instance UID	(0020, 000E)	1C	1
>Series Description	(0008, 103E)	2C	2
>Retrieve AE Title	(0008, 0054)	2C	2
>Referenced Image Sequence	(0008, 1140)	2C	
>>Referenced SOP Class UID	(0008, 1150)	1C	
>>Referenced Instance UID	(0008, 1155)	1C	
>Referenced Standalone SOP Instance Sequence	(0040, 0220)	2C	

E