TOSHIBA

DICOM CONFORMANCE STATEMENT

STORAGE   SCU/SCP

QUERY/RETRIEVE   SCU/SCP
FOR
TOSHIBA WHOLE-BODY X-RAY CT SCANNER

A-SERIES, A-SERIES/MULTI
(COT-30A)(COT-34A)(COT-34C)(COT-35A)(COT-35C)

TOSHIBA CORPORATION

IMPORTANT!

*

Table of Contents

1   Introduction

This document is a DICOM Conformance Statement for Toshiba CT Scanner A-series. 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 which are supported by this product.

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

1.1   References

- 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. 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 a 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

- 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 Standards Organization
- JIRA   Japan Industries Association of Radiological Systems
- NEMA   National Electrical Manufacturers Association
- OSI   Open Systems Interconnection
- 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 Application Data Flow Diagram
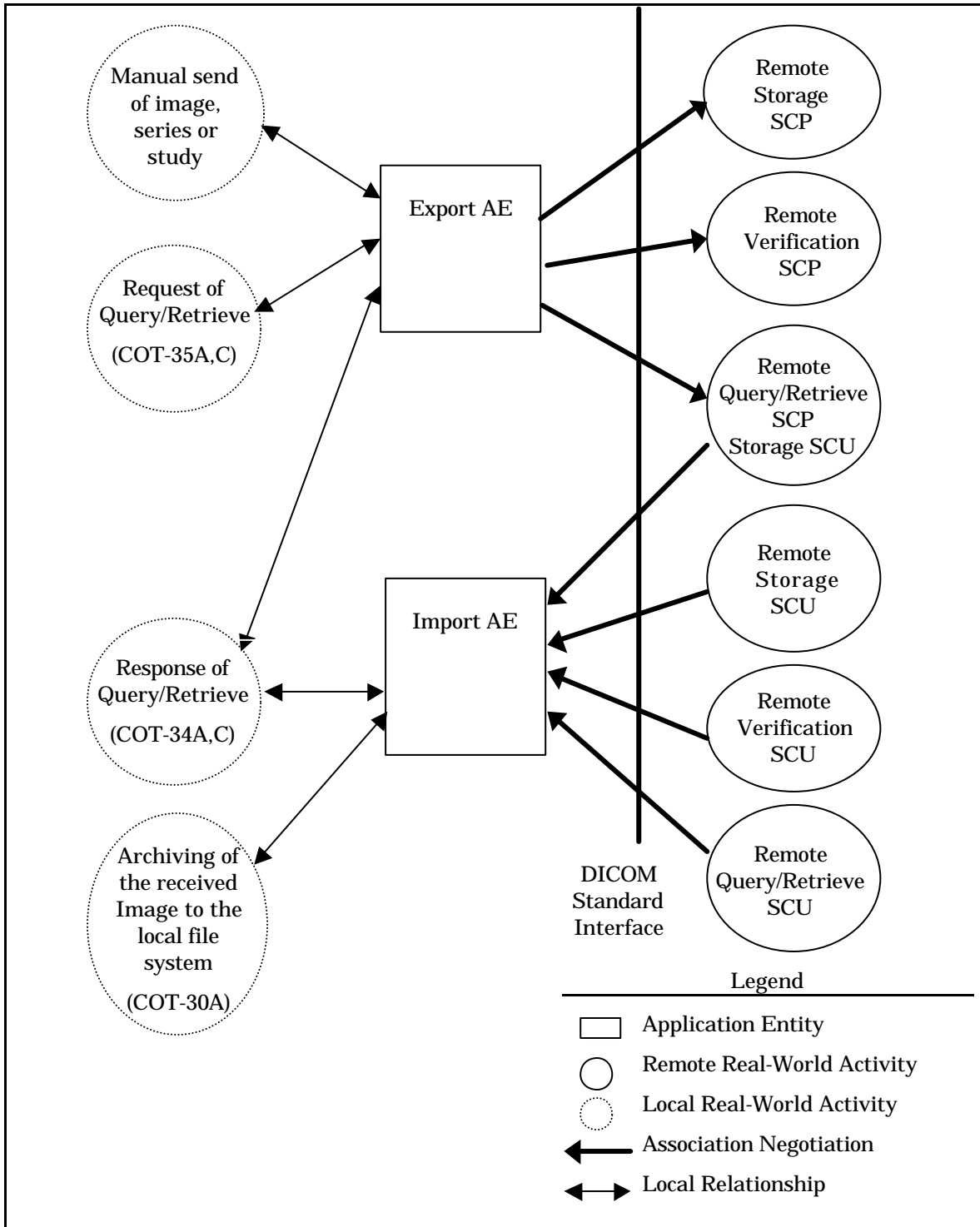
Figure 1

2.2 Functional Definitions of AE's

2.2.1 Export AE

Export AE is used to verify that a remote DICOM device is active on the network, to transmit images to a remote DICOM device, to transmit Query and Retrieve requests to a remote DICOM device. It therefore performs the following tasks:

- Builds DICOM CT and SC Information Objects

- Establishes DICOM Association with remote DICOM device

- Performs storage of DICOM CT and SC Information Objects to remote DICOM device

- Performs request of query to remote DICOM device

- Performs retrieve from a remote DICOM device

- Performs verification of remote DICOM device's presence on network

2.2.2 Import AE

Import AE is used to respond to requests to verify that the A-series is present and active on the network, to receive CT and SC images and to respond to requests of Query/Retrieve from remote DICOM devices, to receive CT and SC images from remote DICOM devices.

2.3 Sequencing of Real World Activities

2.3.1 Features

2.3.1.1 Manual Send of Image, Series or Study

- Operator requests to send images after selecting the images to be transferred from the Study List, the Series List or the Image List.

- When the image transfer fails, the A-series automatically attempts to resend the image at a later time.

2.3.1.2 Request of Query/Retrieve

- Operator can obtain search lists using the patient name, patient ID and/or the examination date as the search key.

- Operator requests to retrieve images after selecting the transferred images from the Study List, the Series List or the Image List.

- When the image transfer fails, the error message is displayed and it is possible to choose whether to abort the transfer or continue.

2.3.1.3 Response of Query/Retrieve

- The A-series returns the result of the search corresponding to the search request.

- The A-series returns the requested images to the retrieve request.

2.3.1.4 Archiving of the Received Image to the Local File System

- The A-series receives CT and SC images from remote DICOM devices.
- The A-series archives the received images to local file system.

2.3.2 Operation

2.3.2.1 Manual Send of Image, Series or Study

The operation for sending images is described below:

Step-1: Select the images, the series or the studies to be sent.

Step-2: Select the destination of image sending.

Step-3: Request sending.

2.3.2.2 Request of Query/Retrieve

The operation for a search request and an image transfer request are described below:

Step-1: Select the source of image transfer.

Step-2: Enter the information, patient name, patient ID and/or examination date, for the items for which the operator wishes to search.

Step-3: Select the images, the series or the studies to be transferred.

Step-4: Select the destination of image transfer.

Step-5: Request transfer.

2.3.2.3 Response of Query/Retrieve

There is no specific operation.

2.3.2.4 Archiving of the Received Image to the Local File System

There is no specific operation.

3   AE Specifications

3.1   Export Specification

Export AE 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
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
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

3.1.1   Export Association Establishment Policies

3.1.1.1   Export General

Export AE will utilize and understand the following Application Context Name:

Table 2

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1

Export AE supports a minimum PDU size of 16Kbytes and a maximum PDU size of 16Kbytes. The default value is set to 16Kbytes.

3.1.1.2   Export Number of Associations

Export AE can only establish one association at a time, independent of the number of destinations chosen.

3.1.1.3   Export Asynchronous Nature

Export AE allows a single outstanding operation on any association. Therefore, Export AE does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

3.1.1.4   Export Implementation Identifying Information

Export AE will specify the following Implementation Identifying Information:

- Implementation Class UID   1.2.392.200036.9116.2.2.2.100
- Implementation Version Name   TM_CT_CMW_V2.00

3.1.2 Export Association Initiation by Real-World Activity

Export AE initiates an association when the following activity is chosen by the operator:

- "Manual send of image, series or study"
    - Verification- Verify that a remote DICOM device is present on the network
    - Storage   - Create and store CT and SC images to a remote DICOM device

    Verification is initiated automatically at the "Manual send of image, series or study"

- "Request of Query/Retrieve"
    - Query/Retrieve(Find) - Get an image list from a remote DICOM device
    - Query/Retrieve(Move)   - Send an image transfer request to a remote

        DICOM device

3.1.2.1 Export Real-World Activity - Verification

3.1.2.1.1 Export Associated Real-World Activity - Verification

Export AE performs Verification automatically before performing an image transfer request. This feature can be turned off in the configuration, should the destination device not support the Verification Service.

3.1.2.1.2 Export Proposed Presentation Contexts - Verification

Export AE proposes the following Presentation Contexts shown below:

Table 3

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			**Extended**
Name	**UID**	**Name List**	**UID List**	**Role**	**Negotiation**
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None

3.1.2.2 Export Real-World Activity - Storage

3.1.2.2.1 Export Associated Real-World Activity - Storage

Storage is executed by the A-series after the operator's image transfer requests are queued.

3.1.2.2.2 Export Proposed Presentation Contexts - Storage

Export AE proposes the following Presentation Contexts shown below:

Table 4

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended
Name	UID	Name List	UID List	Role	Negoti -ation
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

3.1.2.2.2.1 Export SOP Specific Conformance - Storage

Export AE operation involves the following sequence of steps for each image transfer.

    (1) Association establishment (requestor only)

    (2) Data transfer (SCU only)

    (3) Association release (requestor only)

Export AE judges that the transfer of one image succeeded when the result of (2) "Data transfer" is "Success" even if the result of (3) "Association release" is "Failure".

CT and SC Information Object Definitions for Storage SCU are described in chapter 8.

3.1.2.3   Export Real-World Activity - Query/Retrieve(Find)

3.1.2.3.1   Export Associated Real-World Activity -Query/Retrieve(Find)

Query/Retrieve(Find) is executed by the A-series when the operator requests to see the Study, Series or Image list of a remote DICOM device.

3.1.2.3.2   Export Proposed Presentation Contexts -Query/Retrieve(Find)

Export AE proposes the following Presentation Contexts shown below:

Table 5

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended
Name	**UID**	**Name List**	**UID List**	**Role**	**Negoti -ation**
Study root Q/R 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
Study root Q/R Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

3.1.2.3.2.1   Export SOP Specific Conformance - Query/Retrieve(Find)

Export AE operation involves the following sequence of steps for each search request:

(1) Association establishment (requestor only)

(2) Query Request (SCU only)

(3) Association release (requestor only)

Export AE judges that query request succeeded when the result of (2) "Query Request" is "Success" even if the result of (3) "Association release" is "Failure".

Search keys for the Query/Retrieve SCU are described in chapter 10.

3.1.2.4   Export Real-World Activity - Query/Retrieve(MOVE)

3.1.2.4.1   Export Associated Real-World Activity -Query/Retrieve(Move)

Query/Retrieve(Move) is executed by the A-series after the operator's image transfer requests are queued.

3.1.2.4.2   Export Proposed Presentation Contexts -Query/Retrieve(Move)

Export AE proposes the following Presentation Contexts shown below:

Table 6

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Extended
Name	UID	Name List	UID List	Role	Negoti -ation
Study root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
Study root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

3.1.2.4.2.1   Export SOP Specific Conformance - Query/Retrieve(Move)

Export AE operation involves the following sequence of steps for each image transfer.

(1) Association establishment (requestor only)

(2) Retrieve(image transfer) Request (SCU only)

(3) Association release (requestor only)

Export AE judges that the transfer of one image succeeded when the result of (2) "Retrieve Request" is "Success" even if the result of (3) "Association release" is "Failure".

3.1.3   Export Association Acceptance Policy

Export AE does not accept any associations generated by remote applications.

3.2   Import Specification

Import AE provides Standard Conformance to the following DICOM SOP Classes as an SCP:

Table 7

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Patient root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
SC Image Storage	1.2.840.10008.5.1.4.1.1.7

3.2.1   Import Association Establishment Policies

3.2.1.1   Import General

Import AE will utilize and understand the following Application Context Name:

Table 8

DICOM V3.0 Application Context	1.2.840.10008.3.1.1.1

Import AE supports a minimum PDU size of 16Kbytes and a maximum PDU size of 16Kbytes. The default value is set to 16Kbytes.

3.2.1.2   Import Number of Associations

Import AE supports up to three associations at a time.

3.2.1.3   Import Asynchronous Nature

Import AE allows a single outstanding operation on any association. Therefore, Import AE does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

3.2.1.4   Import Implementation Identifying Information

Import AE will specify the following Implementation Identifying Information:

- Implementation Class UID   1.2.392.200036.9116.2.2.2.100
- Implementation Version Name   TM_CT_CMW_V2.00

3.2.2   Import Association Initiation by Real-World Activity

Import AE never initiates an association.

3.2.3   Import Association Acceptance Policy

When Import AE receives an association request, it will allow the following activities to be performed during that association:

- Verification   - Allow a remote DICOM device to verify that the

  A-series is active on the DICOM network
- Query/Retrieve(Find)   - Allow a remote DICOM device to send a search

  request
- Query/Retrieve(Move)   - Allow a remote DICOM device to send a request for

  image transfer
- Storage   - Allow a remote DICOM device to send a CT or SC

  image to the A-series

3.2.3.1   Import Real-World Activity - Verification

3.2.3.1.1   Import Associated Real-World Activity - Verification

The A-series responds to Verification created by a remote Verification SCU.

3.2.3.1.2   Import Presentation Context Table - Verification

Import AE accepts all of the Presentation Contexts shown below:

Table 9

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

3.2.3.1.2.1   Import SOP Specific Conformance - Verification

Import AE responds with the following status codes in response to a C-ECHO request.

Table 10

Service Status	Further Meaning	Protocol Codes	Description
Success	Success	0x0000	Operation performed properly

3.2.3.1.3　Import Presentation Context Acceptance Criterion - Verification

Import AE accepts the Presentation Contexts listed in the Presentation Context Table(Table 9).

3.2.3.1.4　Import Transfer Syntax Selection Policies - Verification

Import AE supports only the Implicit VR Little Endian transfer syntax. It rejects any proposed Presentation Context which does not specify the default Implicit VR Little Endian transfer syntax.

3.2.3.2 Import Real-World Activity - Query/Retrieve(Find)

3.2.3.2.1 Import Associated Real-World Activity - Query/Retrieve(Find)

When a request for a search is performed by a remote system, an association is accepted.

3.2.3.2.2 Import Presentation Context Table - Query/Retrieve(Find)

Import AE accepts all of the Presentation Contexts shown below:

Table 11

Presentation Context Table					
Abstract Syntax		Transfer Syntax			Exten-ded
Name	UID	Name List	UID List	Role	Negoti-ation
Patient root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Study root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient/Study Only Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

3.2.3.2.2.1 Import SOP Specific Conformance - Query/Retrieve(Find)

Import AE responds with the following status codes in response to a C-FIND request.

Table 12

Service Status	Status Codes	Meaning
Refused	0xA700	Out of Resources - Local resource is insufficient.
Failed	0xA900	Identifier does not match SOP Class.
	0xC000	Unable to process - Local Error occurred or unsupported extended character sets. (See section 7 'Support of Extended Character Sets'.)
Cancel	0xFE00	Matching terminated due to Cancel request.
Success	0x0000	Matching is complete - No final Identifier is supplied.
Pending	0xFF00	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.
	0xFF01	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier.

Search keys for Query/Retrieve SCP are described in chapter 10.

3.2.3.2.3 Import Presentation Context Acceptance Criterion
- Query/Retrieve(Find)

Import AE accepts the Presentation Contexts listed in the Presentation Context Table (Table 11).

3.2.3.2.4 Import Transfer Syntax Selection Policies - Query/Retrieve(Find)

Import AE accepts the Transfer Syntax listed in the Presentation Context Table(Table 11).

Selection priority of acceptable Transfer Syntax is Default Transfer Syntax, see 6.4.2.

3.2.3.3 Import Real-World Activity - Query/Retrieve(Move)

3.2.3.3.1 Import Associated Real-World Activity - Query/Retrieve(Move)

When a request for the image transfer is made of a remote system, an association is accepted.

3.2.3.3.2 Import Presentation Context Table - Query/Retrieve(Move)

Import AE accepts all of the Presentation Contexts shown below:

Table 13

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Exten -ded Negoti -ation
Name	UID	Name List	UID List		
Patient root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Study root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Patient/Study Only Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

3.2.3.3.2.1 Import SOP Specific Conformance - Query/Retrieve(Move)

Import AE responds with the following status codes in response to a C-MOVE-RSP request.

Table 14

Service Status	Status Codes	Meaning
Refused	0xA701	Out of Resources - Unable to calculate number of matches.
	0xA702	Out of Resources - Unable to perform sub-operations.
	0xA801	Move Destination unknown
Failed	0xA900	Identifier does not match SOP Class.
	0xC000	Unable to process - Local Error occurred.
Cancel	0xFE00	Sub-operations terminated due to Cancel Indication.
Warning	0xB000	Sub-operations Complete - One or more Failures.
Success	0x0000	Sub-operations Complete - No Failures.

3.2.3.3.3 Import Presentation Context Acceptance Criterion -Query/Retrieve(Move)

Import AE accepts the Presentation Contexts listed in the Presentation Context Table (Table 13).

3.2.3.3.4 Import Transfer Syntax Selection Policies - Query/Retrieve(Move)

Import AE accepts the Transfer Syntax listed in the Presentation Context Table(Table 13).

Selection priority of acceptable Transfer Syntax is Default Transfer Syntax, see 6.4.2.

3.2.3.4   Import Real-World Activity - Storage

3.2.3.4.1   Import Associated Real-World Activity - Storage

The A-series receives image data sent by a remote Storage SCU, archives it to local file system, and responds to the remote Storage SCU.

3.2.3.4.2   Import Presentation Context Table - Storage

Import AE accepts all of the Presentation Contexts shown below:

Table 15

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**			**Extended**
Name	**UID**	**Name List**	**UID List**	**Role**	**Negoti -ation**
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

3.2.3.4.2.1   Import SOP Specific Conformance - Storage

Import AE responds with the following status codes in response to a C-STORE request.

Table 16

Service Status	Further Meaning	Status Codes	Description
Success	Success	0x0000	Operation performed properly
Error	Data Set does not match SOP Class	0xA900	SOP Class UID does not match.
	Cannot understand	0xC000	Invalid data set, or not supported extended character sets. (see chapter 7 'Support of Extended Character Sets')
Refused	Out of Resources	0xA700	Local resource is insufficient.

If the service status response is "Refused" then check the A-series for one of the following situations:

1) Out of free local storage space
2) Busy processes/applications that are draining CPU resources

Import AE is Level 0 Conformance as described in Section B.4.1 of Part 4 of DICOM V3.0 Standard document.

CT and SC Information Object Definitions for Storage SCP are described in chapter 9.

3.2.3.4.3   Import Presentation Context Acceptance Criterion - Storage

Import AE accepts the Presentation Contexts listed in the Presentation Context Table(Table 15).

3.2.3.4.4   Import Transfer Syntax Selection Policies - Storage

Import AE accepts the Transfer Syntax listed in the Presentation Context Table(Table 15).

Selection priority of acceptable Transfer Syntax is Default Transfer Syntax, see 6.4.2.

4 Communication Profiles

4.1 Supported Communication Stacks

This product provides DICOM 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 product inherits its TCP/IP stack from the computer system upon which it executes.

4.3.1 API

Not applicable to this product.

4.3.2 Physical Media Support

This product is indifferent to the physical medium over which TCP/IP executes; it inherits the medium from the computer system upon which it executes.

4.4 Point-to-Point Stack

Not applicable to this product.

5 Extensions/Specializations/Privatizations

Not applicable to this product.

6   Configuration

For the A-series, the configuration can be set using the DICOM Online Setup interface.

Note: Settings is performed by Toshiba Service Personnel at the time of installation of the A-series.

6.1   AE Title/Presentation Address Mapping

Mapping from the AE titles to the presentation addresses are as follows:

- One port number and one AE title can be described for one host name.

- Each AE title is mapped to one port number.

- The A-series has following default values:

    Local Port No.   2700
    Local AE Title   TM_CT_CMW_V2.00

6.2   Configurable Parameters

6.2.1   Time-out Value, Retry Count, Retry Interval

The time-out value, retry count, and retry interval in each status are shown below.
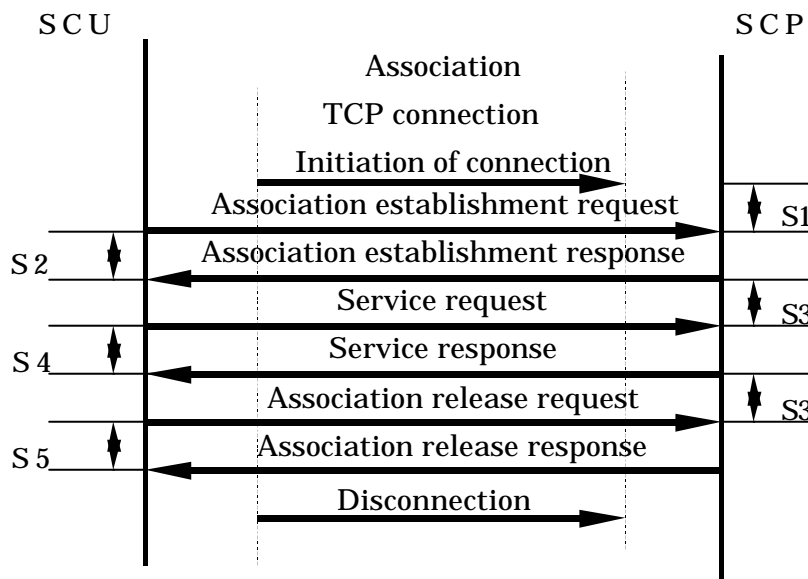
Figure 2

Table 17

Status	Item	Time-out value	Retry count	Retry interval	Remarks
S1	Association establishment request waiting time	default: 30 seconds range: 1 to 999999	Not set	Not set	Only one parameter can be set in the A-series.
S2	Association establishment response waiting time	default: 30 seconds range: 1 to 999999	default: Once range: 0 to 999999	default: 30 seconds range: 0 to 999999	Only one parameter can be set in the A-series.
S3	Service request waiting time	default: 180 seconds range: 1 to 999999	Not set	Not set	Only one parameter can be set in the A-series.
S4	Service response waiting time	default: 180 seconds range: 1 to 999999	Not set	Not set	Can be set for each provided service
S5	Association release waiting time	default: 5 seconds range: 1 to 999999	Not set	Not set	Only one parameter can be set in the A-series.

6.2.2 Warning Status Criteria

The warning status criteria can be set for each station and each service, for Export AE.

6.2.2.1 CT Image Storage

If SUCCESS is set, the A-series judges that the image transfer succeeded.

If FAIL is set, the A-series judges that the image transfer failed.

Table 18

Warning response	Default	Parameter setting range
Coercion of Data Elements	FAIL	SUCCESS or FAIL
Data Set does not match SOP Class	FAIL	SUCCESS or FAIL
Elements discarded	FAIL	SUCCESS or FAIL

6.2.2.2 SC Image Storage

If SUCCESS is set, the A-series judges that the image transfer succeeded.

If FAIL is set, the A-series judges that the image transfer failed.

Table 19

Warning response	Default	Parameter setting range
Coercion of Data Elements	FAIL	SUCCESS or FAIL
Data Set does not match SOP Class	FAIL	SUCCESS or FAIL
Elements discarded	FAIL	SUCCESS or FAIL

6.3 Implementation Information and Maximum Reception PDU Size

The default values for the A-series are used for the Implementation Class UID, the Implementation Version name, and the Maximum length received. They cannot be changed.

Table 20

Parameter	Default
Implementation Class UID	1.2.392.200036.9116.2.2.2.100
Implementation Version Name	TM_CT_CMW_V2.00
Maximum length received	0x4000(16Kbytes)

6.4 Default Transfer Syntax

6.4.1 Export AE

In CT Image Storage and SC Image Storage, when two transfer syntax responses are received, the A-series performs the transfer using the following setting:

Default = "Explicit VR Big Endian"

6.4.2 Import AE

Selection priority of acceptable Transfer Syntax is following Default Transfer Syntax:

Default = "Explicit VR Big Endian"

7 Support of Extended Character Sets

This product supports the following character sets:

- ISO-IR 6 (default)   Basic G0 Set

- ISO-IR 100 (Latin Alphabet No.1)   Supplementary set
  of ISO 8859

If Import AE receives image data that contains characters from an unsupported character set, Import AE will respond with "Cannot understand" to the C-STORE request.

If Import AE receives query request that contains characters from an unsupported character set, Import AE will respond with "Unable to process" to the C-FIND request.

If Import AE receives image data that contains characters from 'ISO-IR 100', a G1 character may replace any G0 character. The method of replacement is configurable. It can be set using the service tool.

Note: Settings is performed by Toshiba Service Personnel at the time of installation of the A-series.

8 Information Object Definition - Storage SCU

8.1 Entity Module Definitions

The information modules for the A-series Storage SCU are defined below.

8.1.1 CT IOD Modules

Table 21

Information Entity	Module	Reference	Usage [1]
Patient	Patient Module	8.2.1	M
Study	General Study Module	8.2.2	M
	Patient Study Module	8.2.3	U
Series	General Series Module	8.2.4	M
Frame of Reference	Frame of Reference Module	8.2.5	M
Equipment	General Equipment Module	8.2.6	M
Image	General Image Module	8.2.7	M
	Image Plane Module	8.2.8	M
	Image Pixel Module	8.2.9	M
	Contrast/bolus Module	8.2.10	C
	VOI LUT Module	8.2.11	U
	SOP Common Module	8.2.12	M
	CT Image Module	8.2.13	M

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

8.1.2 SC IOD Modules

Table 22

Information Entity	Module	Reference	Usage [1]
Patient	Patient Module	8.2.1	M
Study	General Study Module	8.2.2	M
	Patient Study Module	8.2.3	U
Series	General Series Module	8.2.4	M
Equipment	General Equipment Module	8.2.6	U
	SC Equipment Module	8.2.14	M
Image	General Image Module	8.2.7	M
	Image Pixel Module	8.2.9	M
	SC Image Module	8.2.15	M
	VOI LUT Module	8.2.11	U
	SOP Common Module	8.2.12	M

[1]: M=Mandatory, U=User option

8.2 Information Object Definitions

8.2.1 Patient Module

Table 23

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	Always set
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	Not set when no entry is made

8.2.2 General Study Module

Table 24

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

8.2.3 Patient Study Module

Table 25

Attribute Name	Tag	Type	Attribute Description
Patient's Age	(0010,1010)	3	Not set when no entry is made

8.2.4 General Series Module

Table 26

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	Always set("CT")
Series Instance UID	(0020,000E)	1	Always set
Series Number	(0020,0011)	2	Always set
Series Date	(0008,0021)	3	Always set
Series Time	(0008,0031)	3	Always set
Operator's Name	(0008,1070)	3	Not set when no entry is made
Patient Position	(0018,5100)	2C	Always set
Laterality	(0020,0060)	2C	Length=0 when no entry is made

8.2.5 Frame of Reference Module

Table 27

Attribute Name	Tag	Type	Attribute Description
Frame of Reference UID	(0020,0052)	1	Always set
Position Reference Indicator	(0020,1040)	2	Length=0 when no entry is made

8.2.6 General Equipment Module

Table 28

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	Always set("TOSHIBA")
Institution Name	(0008,0080)	3	Always set
Station Name	(0008,1010)	3	Always set
Institutional Department Name	(0008,1040)	3	Not set when no entry is made
Manufacturer's Model Name	(0008,1090)	3	Always set
Device Serial Number	(0018,1000)	3	Not set when no entry is made
Software Versions	(0018,1020)	3	Not set when no entry is made

8.2.7   General Image Module

Table 29

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	Always set
Patient Orientation	(0020,0020)	2C	Not set when no entry is made
Image Date	(0008,0023)	2C	Always set
Image Time	(0008,0033)	2C	Always set
Image Type	(0008,0008)	3	Always set (See 8.2.13)
Acquisition Number	(0020,0012)	3	Always set
Acquisition Date	(0008,0022)	3	Always set
Acquisition Time	(0008,0032)	3	Always set
Image in Acquisition	(0020,1002)	3	Not set when no entry is made
Image Comments	(0020,4000)	3	Not set when no entry is made

8.2.8   Image Plane Module

Table 30

Attribute Name	Tag	Type	Attribute Description
Pixel Spacing	(0028,0030)	1	Always set
Image Orientation(Patient)	(0020,0037)	1	Always set
Image Position(Patient)	(0020,0032)	1	Always set
Slice Thickness	(0018,0050)	2	Always set

8.2.9 Image Pixel Module

Table 31

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	Always set[1]
Photometric Interpretation	(0028,0004)	1	Always set[2]
Rows	(0028,0010)	1	Always set
Columns	(0028,0011)	1	Always set
Bits Allocated	(0028,0100)	1	Always set[3]
Bits Stored	(0028,0101)	1	Always set[4]
High Bit	(0028,0102)	1	Always set[5]
Pixel Representation	(0028,0103)	1	Always set
Pixel Data	(7FE0,0010)	1	Always set
Planar Configuration	(0028,0006)	1C	If the setting conditions are met, set(0)

[1]CT Image Storage:See 8.2.13

 SC Image Storage:1(when "MONOCHROME2") or 3(when "RGB")

[2]CT Image Storage:See 8.2.13

 SC Image Storage:"MONOCHROME2" or "RGB"

[3]CT Image Storage:See 8.2.13

 SC Image Storage:16(when "MONOCHROME2") or 8(when "RGB")

[4]CT Image Storage:See 8.2.13

 SC Image Storage:16(when "MONOCHROME2") or 8(when "RGB")

[5]CT Image Storage:See 8.2.13

 SC Image Storage:15(when "MONOCHROME2") or 7(when "RGB")

8.2.10 Contrast/Bolus Module

This module is set if contrast media was used in the image.

Table 32

Attribute Name	Tag	Type	Attribute Description
Contrast/Bolus Agent	(0018,0010)	2	Always set
Contrast/Bolus Volume	(0018,1041)	3	Not set when no entry is made

8.2.11 VOI LUT Module

Table 33

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

8.2.12 SOP Common Module

Table 34

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 when an expanded or replacement character set is used.

8.2.13 CT Image Module

Table 35

Attribute Name	Tag	Type	Attribute Description
Image Type	(0008,0008)	1	Always set ("ORIGINAL¥PRIMARY¥AXIAL", "ORIGINAL¥PRIMARY¥LOCALIZER" or "DERIVED¥SECONDARY")
Samples per Pixel	(0028,0002)	1	Always set (1)
Photometric Interpretation	(0028,0004)	1	Always set ("MONOCHROME2")
Bits Allocated	(0028,0100)	1	Always set (16)
Bits Stored	(0028,0101)	1	Always set (16)
High Bit	(0028,0102)	1	Always set (15)
Rescale Intercept	(0028,1052)	1	Always set("0")
Rescale Slope	(0028,1053)	1	Always set("1")
KVP	(0018,0060)	2	Always set
Acquisition Number	(0020,0012)	2	Always set
Scan Options	(0018,0022)	3	Always set One of following choices is set for Scan Options: "SCANOSCOPE","NORMAL_CT", "DYNAMIC_CT", "HELICAL_CT"
Reconstruction Diameter	(0018,1100)	3	Always set
Gantry/Detector Tilt	(0018,1120)	3	Always set
Table Height	(0018,1130)	3	Always set
Rotation Direction	(0018,1140)	3	Always set
Exposure Time	(0018,1150)	3	Always set
X-ray Tube Current	(0018,1151)	3	Always set
Exposure	(0018,1152)	3	Always set
Convolution Kernel	(0018,1210)	3	Always set

8.2.14 SC Equipment Module

Table 36

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008,0064)	1	Always set ("WSD")
Modality	(0008,0060)	3	Always set("CT")
Secondary Capture Device ID	(0018,1010)	3	Not set when no entry is made
Secondary Capture Device Manufacturer	(0018,1016)	3	Not set when no entry is made
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	3	Not set when no entry is made
Secondary Capture Device Software Version	(0018,1019)	3	Not set when no entry is made

8.2.15 SC Image Module

Table 37

Attribute Name	Tag	Type	Attribute Description
Date of Secondary Capture	(0018,1012)	3	Not set when no entry is made
Time of Secondary Capture	(0018,1014)	3	Not set when no entry is made

9 Information Object Definition - Storage SCP

9.1 Entity Module Definitions

The information modules for the A-series Storage SCP are defined below.

9.1.1 CT IOD Modules

Table 38

Information Entity	Module	Reference	Usage[1]
Patient	Patient Module	9.2.1	M
Study	General Study Module	9.2.2	M
	Patient Study Module	9.2.3	U
Series	General Series Module	9.2.4	M
Frame of Reference	Frame of Reference Module	9.2.5	M
Equipment	General Equipment Module	9.2.6	M
Image	General Image Module	9.2.7	M
	Image Plane Module	9.2.8	M
	Image Pixel Module	9.2.9	M
	Contrast/bolus Module	9.2.10	C
	VOI LUT Module	9.2.11	U
	SOP Common Module	9.2.12	M
	CT Image Module	9.2.13	M

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

9.1.2 SC IOD Modules

Table 39

Information Entity	Module	Reference	Usage [1]
Patient	Patient Module	9.2.1	M
Study	General Study Module	9.2.2	M
	Patient Study Module	9.2.3	U
Series	General Series Module	9.2.4	M
Equipment	General Equipment Module	9.2.6	U
	SC Equipment Module	9.2.14	M
Image	General Image Module	9.2.7	M
	Image Pixel Module	9.2.9	M
	SC Image Module	9.2.15	M
	VOI LUT Module	9.2.11	U
	SOP Common Module	9.2.12	M

[1]: M=Mandatory, U=User option

9.2   Information Object Definitions

9.2.1   Patient Module

Table 40

Attribute Name	Tag	Type	Attribute Description
Patient's Name	(0010,0010)	2	
Patient ID	(0010,0020)	2	
Patient's Birth Date	(0010,0030)	2	
Patient's Sex	(0010,0040)	2	
Other Patient IDs	(0010,1000)	3	
Other Patient Names	(0010,1001)	3	
Patient Comments	(0010,4000)	3	

9.2.2   General Study Module

Table 41

Attribute Name	Tag	Type	Attribute Description
Study Instance UID	(0020,000D)	1	
Study Date	(0008,0020)	2	
Study Time	(0008,0030)	2	
Referring Physician's Name	(0008,0090)	2	
Study ID	(0020,0010)	2	
Accession Number	(0008,0050)	2	
Study Description	(0008,1030)	3	
Name of Physician(s) Reading Study	(0008,1060)	3	

9.2.3   Patient Study Module

Table 42

Attribute Name	Tag	Type	Attribute Description
Admitting Diagnoses Description	(0008,1080)	3	
Patient's Age	(0010,1010)	3	
Patient's Size	(0010,1020)	3	
Patient's Weight	(0010,1030)	3	

9.2.4   General Series Module

Table 43

Attribute Name	Tag	Type	Attribute Description
Modality	(0008,0060)	1	
Series Instance UID	(0020,000E)	1	
Series Number	(0020,0011)	2	
Laterality	(0020,0060)	2C	
Series Date	(0008,0021)	3	
Series Time	(0008,0031)	3	
Performing Physicians' Name	(0008,1050)	3	
Protocol Name	(0018,1030)	3	
Body Part Examined	(0018,0015)	3	
Patient Position	(0018,5100)	2C	

9.2.5   Frame of Reference Module

Table 44

Attribute Name	Tag	Type	Attribute Description
Frame of Reference UID	(0020,0052)	1	
Position Reference Indicator	(0020,1040)	2	

9.2.6   General Equipment Module

Table 45

Attribute Name	Tag	Type	Attribute Description
Manufacturer	(0008,0070)	2	
Institution Name	(0008,0080)	3	
Station Name	(0008,1010)	3	
Institutional Department Name	(0008,1040)	3	
Manufacturer's Model Name	(0008,1090)	3	
Device Serial Number	(0018,1000)	3	
Software Versions	(0018,1020)	3	
Spatial Resolution	(0018,1050)	3	
Date of Last Calibration	(0018,1200)	3	
Time of Last Calibration	(0018,1201)	3	

9.2.7 General Image Module

Table 46

Attribute Name	Tag	Type	Attribute Description
Instance Number	(0020,0013)	2	
Patient Orientation	(0020,0020)	2C	
Image Date	(0008,0023)	2C	
Image Time	(0008,0033)	2C	
Image Type	(0008,0008)	3	
Acquisition Number	(0020,0012)	3	
Acquisition Date	(0008,0022)	3	
Acquisition Time	(0008,0032)	3	
Images in Acquisition	(0020,1002)	3	
Image Comments	(0020,4000)	3	

9.2.8 Image Plane Module

Table 47

Attribute Name	Tag	Type	Attribute Description
Pixel Spacing	(0028,0030)	1	
Image Orientation(Patient)	(0020,0037)	1	
Image Position(Patient)	(0020,0032)	1	
Slice Thickness	(0018,0050)	2	
Slice Location	(0020,1041)	3	

9.2.9 Image Pixel Module

Table 48

Attribute Name	Tag	Type	Attribute Description
Samples per Pixel	(0028,0002)	1	
Photometric Interpretation	(0028,0004)	1	
Rows	(0028,0010)	1	
Columns	(0028,0011)	1	
Bits Allocated	(0028,0100)	1	
Bits Stored	(0028,0101)	1	
High Bit	(0028,0102)	1	
Pixel Representation	(0028,0103)	1	
Pixel Data	(7FE0,0010)	1	
Pixel Aspect Ratio	(0028,0034)	1C	
Smallest Image Pixel Value	(0028,0106)	3	
Largest Image Pixel Value	(0028,0107)	3	
Planar Configuration	(0028,0006)	1C	

9.2.10 Contrast/Bolus Module

This module is set if contrast media was used in the image.

Table 49

Attribute Name	Tag	Type	Attribute Description
Contrast/Bolus Agent	(0018,0010)	2	
Contrast/Bolus Route	(0018,1040)	3	
Contrast/Bolus Volume	(0018,1041)	3	
Contrast/Bolus Start Time	(0018,1042)	3	
Contrast/Bolus Stop Time	(0018,1043)	3	
Contrast/Bolus Total Dose	(0018,1044)	3	

9.2.11 VOI LUT Module

Table 50

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

9.2.12 SOP Common Module

Table 51

Attribute Name	Tag	Type	Attribute Description
SOP Class UID	(0008,0016)	1	
SOP Instance UID	(0008,0018)	1	

9.2.13 CT Image Module

Table 52

Attribute Name	Tag	Type	Attribute Description
Image Type	(0008,0008)	1	
Samples per Pixel	(0028,0002)	1	
Photometric Interpretation	(0028,0004)	1	
Bits Allocated	(0028,0100)	1	
Bits Stored	(0028,0101)	1	
High Bit	(0028,0102)	1	
Rescale Intercept	(0028,1052)	1	
Rescale Slope	(0028,1053)	1	
KVP	(0018,0060)	2	
Acquisition Number	(0020,0012)	2	
Scan Options	(0018,0022)	3	
Data Collection Diameter	(0018,0090)	3	
Reconstruction Diameter	(0018,1100)	3	
Distance Source to Detector	(0018,1110)	3	
Distance Source to Patient	(0018,1111)	3	
Gantry/Detector Tilt	(0018,1120)	3	
Table Height	(0018,1130)	3	
Rotation Direction	(0018,1140)	3	
Exposure Time	(0018,1150)	3	
X-ray Tube Current	(0018,1151)	3	
Exposure	(0018,1152)	3	
Filter Type	(0018,1160)	3	
Generator Power	(0018,1170)	3	
Focal Spot	(0018,1190)	3	
Convolution Kernel	(0018,1210)	3	

9.2.14   SC Equipment Module

Table 53

Attribute Name	Tag	Type	Attribute Description
Conversion Type	(0008,0064)	1	
Modality	(0008,0060)	3	
Secondary Capture Device ID	(0018,1010)	3	
Secondary Capture Device Manufacturer	(0018,1016)	3	
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	3	
Secondary Capture Device Software Version	(0018,1019)	3	

9.2.15   SC Image Module

Table 54

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

10 Search Keys

10.1 Query/Retrieve SCU (C-FIND)

The search keys used for the Query/Retrieve SCU(C-FIND) are shown.

10.1.1 Study Root Information Model-FIND

10.1.1.1 Study Level

Table 55

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Study Description	(0008,1030)	O
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	R
Patient's Sex	(0010,0040)	O
Patient's Age	(0010,1010)	O
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	R
Number of Study Related Series	(0020,1206)	O
Number of Study Related Images	(0020,1208)	O

10.1.1.2 Series Level

Table 56

Attribute Name	Tag	Type
Modality	(0008,0060)	R
Series Instance UID	(0020,000E)	U
Series Number	(0020,0011)	R

10.1.1.3　Instance Level

Table 57

Attribute Name	Tag	Type
SOP Instance UID	(0008,0018)	U
Acquisition Date	(0008,0022)	O
Contrast/Bolus Agent	(0018,0010)	O
Scanning Sequence	(0018,0020)	O
Slice Thickness	(0018,0050)	O
KVP	(0018,0060)	O
Repetition Time	(0018,0080)	O
Echo Time	(0018,0081)	O
Inversion Time	(0018,0082)	O
Echo Number(s)	(0018,0086)	O
Gantry/Detector Tilt	(0018,1120)	O
X-ray Tube Current	(0018,1151)	O
Convolution Kernel	(0018,1210)	O
Acquisition Number	(0020,0012)	O
Instance Number	(0020,0013)	R
Rows	(0028,0010)	O
Columns	(0028,0011)	O

10.2　Query/Retrieve SCP (C-FIND)

The search keys used for the Query/Retrieve SCP(C-FIND) are shown.

10.2.1　Patient Root Information Model-FIND

10.2.1.1　Patient Level

Table 58

Attribute Name	Tag	Type
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	U
Patient's Sex	(0010,0040)	O

10.2.1.2　Study Level

Table 59

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Patient's Age	(0010,1010)	O
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	R
Number of Study Related Series	(0020,1206)	O
Number of Study Related Images	(0020,1208)	O

10.2.1.3　Series Level

Table 60

Attribute Name	Tag	Type
Modality	(0008,0060)	R
Series Number	(0020,0011)	R
Series Instance UID	(0020,000E)	U

10.2.1.4 Instance Level

Table 61

Attribute Name	Tag	Type
SOP Instance UID	(0008,0018)	U
Acquisition Date	(0008,0022)	O
Contrast/Bolus Agent	(0018,0010)	O
Scanning Sequence	(0018,0020)	O
Slice Thickness	(0018,0050)	O
KVP	(0018,0060)	O
X-ray Tube Current	(0018,1151)	O
Convolution Kernel	(0018,1210)	O
Instance Number	(0020,0013)	R

10.2.2 Study Root Information Model-FIND

10.2.2.1 Study Level

Table 62

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	R
Patient's Sex	(0010,0040)	O
Patient's Age	(0010,1010)	O
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	R
Number of Study Related Series	(0020,1206)	O
Number of Study Related Images	(0020,1208)	O

10.2.2.2 Series Level

Table 63

Attribute Name	Tag	Type
Modality	(0008,0060)	R
Series Number	(0020,0011)	R
Series Instance UID	(0020,000E)	U

10.2.2.3 Instance Level

Table 64

Attribute Name	Tag	Type
SOP Instance UID	(0008,0018)	U
Acquisition Date	(0008,0022)	O
Contrast/Bolus Agent	(0018,0010)	O
Scanning Sequence	(0018,0020)	O
Slice Thickness	(0018,0050)	O
KVP	(0018,0060)	O
X-ray Tube Current	(0018,1151)	O
Convolution Kernel	(0018,1210)	O
Instance Number	(0020,0013)	R

10.2.3 Patient/Study Only Information Model - FIND

10.2.3.1 Patient Level

Table 65

Attribute Name	Tag	Type
Patient's Name	(0010,0010)	R
Patient ID	(0010,0020)	U
Patient's Sex	(0010,0040)	O

10.2.3.2   Study Level

Table 66

Attribute Name	Tag	Type
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Accession Number	(0008,0050)	R
Patient's Age	(0010,1010)	O
Study Instance UID	(0020,000D)	U
Study ID	(0020,0010)	R
Number of Study Related Series	(0020,1206)	O
Number of Study Related Images	(0020,1208)	O

E