Philips Medical Systems
DICOM Conformance Statement

CT Vision systems (Release 1.5)
CT Aura / CT Secura

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PHILIPS

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1 Introduction

This chapter provides general information about the purpose, scope and contents of this Conformance Statement.

1.1 Scope and field of application

The scope of this DICOM Conformance Statement is to facilitate data exchange with equipment of Philips Medical Systems. This document specifies the compliance to the DICOM standard (formally called the NEMA PS 3.X standards). It contains a short description of the applications involved and provides technical information about the data exchange capabilities of the equipment. The main elements describing these capabilities are: the supported DICOM Service Object Pair (SOP) Classes, Roles, Information Object Definitions (IOD) and Transfer Syntaxes.

The field of application is the integration of the Philips Medical Systems equipment into an environment of medical devices.
This Conformance Statement should be read in conjunction with the DICOM standard and its addenda [DICOM].

1.2 Intended audience

This Conformance Statement is intended for:
- (potential) customers,
- system integrators of medical equipment,
- marketing staff interested in system functionality,
- software designers implementing DICOM interfaces.

It is assumed that the reader is familiar with the DICOM standard.

1.3 Contents and structure

The DICOM Conformance Statement is contained in chapter 2 through 7 and follows the contents and structuring requirements of DICOM PS 3.2.

1.4 Used definitions, terms and abbreviations

DICOM definitions, terms and abbreviations are used throughout this Conformance Statement. For a description of these, see NEMA PS 3.3 and PS 3.4.
The word Philips in this document refers to Philips Medical Systems.

1.5 References

[DICOM]   The Digital Imaging and Communications in Medicine (DICOM) standard:
             NEMA PS 3.X
             National Electrical Manufacturers Association (NEMA) Publication Sales
             1300 N. 17th Street, Suite 1847
             Rosslyn, Va. 22209, United States of America

1.6 Important note to the reader

This Conformance Statement by itself does not guarantee successful interoperability of Philips equipment with non-Philips equipment. The user (or user's agent) should be aware of the following issues:

- **Interoperability**

  Interoperability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a networked environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee interoperability of Philips equipment with non-Philips equipment. It is the user's responsibility to analyse thoroughly the application requirements and to specify a solution that integrates Philips equipment with non-Philips equipment.

- **Validation**

  Philips equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Philips equipment is linked to non-Philips equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation tests will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- **New versions of the DICOM Standard**

  The DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Philips is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Philips reserves the right to make changes to its products or to discontinue its delivery.
  The user should ensure that any non-Philips provider linking to Philips equipment, also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Philips equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

1.7 General Acronyms and Abbreviations.

The following acronyms and abbreviations are used in all Philips Conformance Statements.

- ACC   American College of Cardiology
- AE   Application Entity
- ACR   American College of Radiology
- ANSI   American National Standard Institute
- BOT   Basic Offset Table
- CD-R   CD Recordable
- CD-M   CD Medical
- DCI   Digital Cardio Imaging
- DCR   Dynamic Cardio Review
- DICOM   Digital Imaging and Communication in Medicine
- DIMSE   DICOM Message Service Element
- DIMSE-C   DICOM Message Service Element-Composite
- DIMSE-N   DICOM Message Service Element-Normalized
- ELE   Explicit VR Little Endian
- EBE   Explicit VR Big Endian
- FSC   File Set Creator
- GUI   Graphic User Interface
- HIS   Hospital Information System
- HL7   Health Level Seven
- ILE   Implicit VR Little Endian
- IOD   Information Object Definition
- ISIS   Information System - Imaging System
- NEMA   National Electrical Manufacturers Association
- PDU   Protocol Data Unit
- RIS   Radiology Information System
- RWA   Real World Activity
- SC   Secondary Capture
- SCM   Study Component Management
- SCP   Service Class Provider
- SCU   Service Class User
- SOP   Service Object Pair
- TCP/IP   Transmission Control Protocol/Internet protocol
- UID   Unique Identifier
- WLM   Worklist Management

2 Implementation model

The CT Vision systems Release 1.5 (from now on mentioned as CT) of Philips Medical Systems are the following scanners:
- CT Aura System
- CT Secura System

These scanners are generating Computed Tomography (CT) images.

Converter boxes might be connected to the CT (although they are not delivered by Philips Medical Systems, possibly installed on hospital project basis). Conformance to the DICOM standard and to this Conformance Statement is not guaranteed for these converter boxes.

The CT provides the following DICOM data exchange features:
- it allows the user to export CT and SC Images.
- it allows the user to import X-ray, CT, SC and MR Images
- it allows the user to print to a DICOM network printer.
- it allows the user to export to and import images from and to a CD-r.
- Modality Worklist Management (WLM).
- Modality Performed Procedure Step (MPPS).
- Query/Retrieve.
- Storage Commitment Push Model

2.1 Application Data Flow Diagram

The CT system behaves as a multiple Application Entity. Its related Implementation Model is shown in Figure 2-1 on page 9.

Furthermore the CT system is able to display the contents (i.e., directory listing) of DICOM CD-Recordable disks and to write, read and update images on/from a DICOM CD-Recordable disk.

2.2 Functional definition of Application Entities

The CT Application Network Entity acts as a Service Class User (SCU) and Service Class Provider (SCP):
- SCU for storage of CT, SC, Q/R, Printing and Storage Commit

SCP for storage of CT, SC, MR and X-ray Images, Q/R

The CT Application RIS Entity acts as a Service Class User (SCU)\:
- MPPS and WLM

The CT Media AE acts as a File Set Creator (FSC), File Set Reader (FSR) and File Set Updater (FSU) of the Media Service Class.

2.3 Sequencing of Real World Activities

All Real-World Activities as specified in Figure 2-1 may occur independently from each other, except that the two local Print Real-World Activities are mutually exclusive: A request for the printer status is not done when a request for image printing is busy, and vice versa.

Figure 2-1: CT Implementation Model/Network

The circles to the left represent the Local Real-World
Activities and refer to the related section in this Statement.
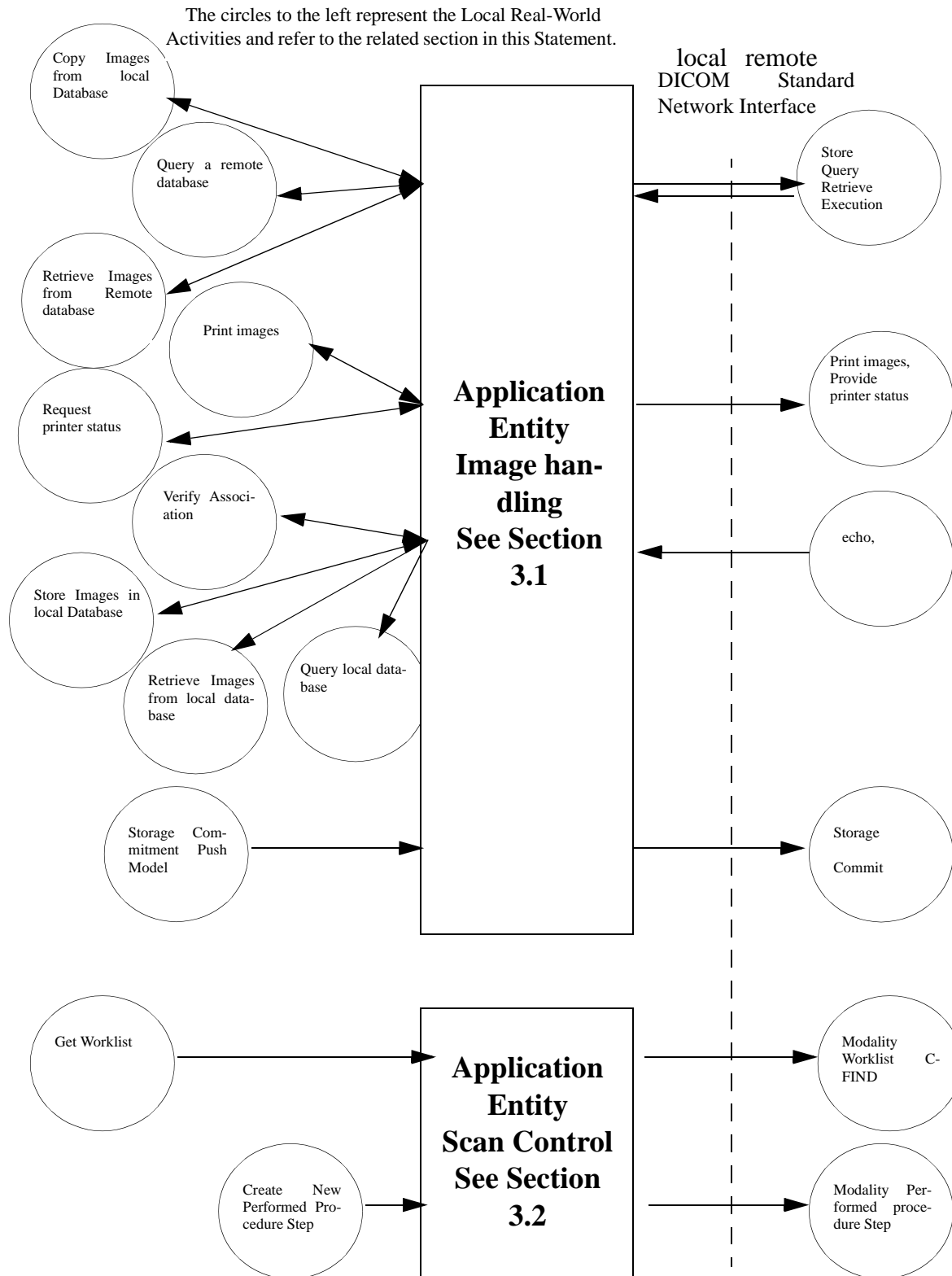
Figure 2-2: CT Implementation Model/Media

The circles to the left represent the Local Real-World
Activities and refer to the related section in this Statement.
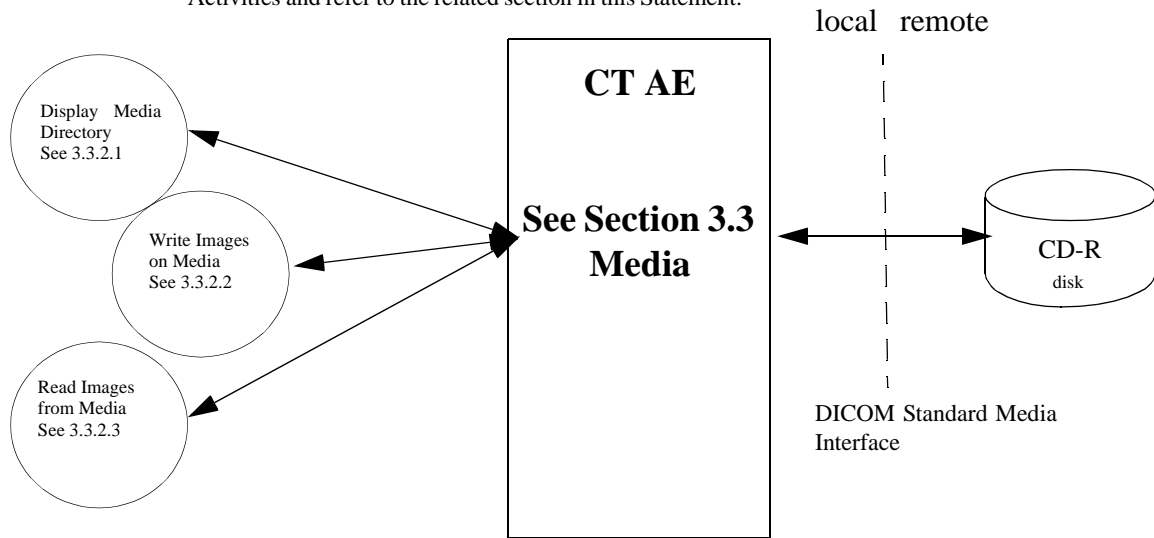
3 AE Specifications

The Network capabilities of the CT DICOM Network Application Entity are specified in section 3.1, the CT RIS Application Entity capabilities are specified in section 3.2 and the Media capabilities are specified in section 3.3.

3.1 CT AE Network Specification

The CT Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCU specified in Table 3-1. The following remarks are important:

- In case the remote system does not support the import of a specific Image Storage SOP Class, CT system will convert (if configured to do so) these images and sends them via the SC Image SOP Class.
- The Private SOP Classes may be stored in image archives but are to be used in the CT systems only. See also section 5 on page 56.

Table 3-1: Supported SOP classes by the CT AE as SCU

SOP class Name	UID
Storage Commitment Push Model	1.2.840.10008.1.20.1
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
Basic Color Print Management Meta SOP Class	1.2.840.10008.5.1.1.18
>[a] 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
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
Patient Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Study Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Patient/Study Only Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2

Table 3-1: Supported SOP classes by the CT AE as SCU (Continued)

SOP class Name	UID
3D Volume Storage (**Private class**)	1.3.46.670589.5.0.1
3D Object Storage (**Private class**)	1.3.46.670589.5.0.2
Surface Storage (**Private class**)	1.3.46.670589.5.0.3
Composite Object Storage (**Private class**)	1.3.46.670589.5.0.4

a. The '>' sign indicates that the SOP Class is part of the above mentioned Meta SOP Class.

The CT Application Entity provides Standard Conformance to the following DICOM V3.0 SOP classes as an SCP specified in Table 3-2. The following remarks are important:

• The Private SOP Classes may be stored in image archives but are to be used in the CT systems only. See also section 5 on page 56.

Table 3-2: Supported SOP classes by the CT AE as SCP

SOP class Name	UID
Verification	1.2.840.10008.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
SC Image Storage	1.2.840.10008.5.1.4.1.1.7
XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1
RF Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Patient Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Study Root Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Patient/Study Only Query/Retrieve Info Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Patient/Study Only Query/Retrieve Info Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2
3D Volume Storage (**Private class**)	1.3.46.670589.5.0.1
3D Object Storage (**Private class**)	1.3.46.670589.5.0.2
Surface Storage (**Private class**)	1.3.46.670589.5.0.3
Composite Object Storage (**Private class**)	1.3.46.670589.5.0.4

3.1.1 Association Establishment Policies

3.1.1.1 General

The CT as SCU will offer unrestricted maximum PDU size on Associations initiated by the CT itself. This is also configurable per remote station. The CT as SCP will offer the same PDU size as offered on Associations initiated by remote applications (SCU), this is not configurable, and will then use that same value as its own maximum PDU size.

3.1.1.2 Number of Associations

As SCP: The number of simultaneous Associations supported by the CT as a Service Class Provider is in principle not limited. The practical maximum number of supported Associations is determined by the amount of resources (CPU, memory, hard disk size).

As SCU: As a result of local activities, the CT can initiate a 1 simultaneous Associations for each of the following services:
- Storage
- Print

3.1.1.3 Asynchronous Nature

The CT does not support asynchronous operations and will not perform asynchronous window negotiation.

3.1.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.5.2.13
The implementation version name is: EV44

3.1.2 Association Initiation Policy

The CT initiates Associations as a result of the following events:
- The CT operator requests to send selected images from the CT database to another database (i.e., image export), see section 3.1.2.1 on page 14;
- The CT operator requests to print selected images in the CT database, see section 3.1.2.5 on page 32.
- The CT operator requests for the status of a selected printer, see section 3.1.2.6 on page 38.
- Query Remote Database

3.1.2.1 Request to send Images from the CT to a remote system.

3.1.2.1.1   Associated Real-World Activity

The operator is able to copy all/selected images in a patient folder from the local CT database to a another database (i.e., image export) by means of the copy tool on the image handling system. The CT initiates for each selected patient an Association to the selected peer entity and uses it to send C-STORE requests (and receive the associated store replies). The Association is released when all selected images in the selected folder have been transmitted. The CT handles operator copy requests one after the other.

A remote application queries images from the local CT database. The CT DICOM query as SCU for all possible levels all the required and the unique keys. No optional keys are queried.

The Images are sent to a another database by sending a C-MOVE request to CT. CT initiates for each received retrieve request an Association to the requested move destination and uses it to send C-STORE requests (and receive the associated store replies). The Association is released when all images selected by the retrieve request identifier have been transmitted. CT is able to simultaneously handle C-MOVE requests.

3.1.2.1.2   Proposed Presentation Contexts

The CT will propose the following presentation contexts:

Table 3-3: Proposed Presentation Contexts for the CT to Other

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE ELE EBE JPEG Baseline JPEG Extended JPEG Lossless, Non-Hierarchical JPEG Lossless, Hierarchical, First Order Prediction	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.57 1.2.840.10008.1.2.4.70	SCU SCU SCU SCU SCU SCU SCU	None None None None None None None

Note: Any of the Standard Image Storage and Private SOP classes listed in Table 3-1, "Supported SOP classes by the CT AE as SCU," on page 11.
For performance reasons the EBE is preferred.

3.1.2.1.3   C-STORE SCU Conformance

Extended negotiation is not supported.

Status display and error handling:
The store response status is displayed via the user interface of the CT.
The CT will stop the transfer of the images and release the Association as soon as it receives an unsuccessful or warning store response status. In case a remote application requested the trans-

fer (by means of a C-MOVE request), a move response with status unsuccessful is sent to the retrieve requester.

Generation of new images:
Some CT applications are able to generate new derived images from a set of received (original) images. An example is a 3D reconstructed image from a CT image set. The attributes in these generated images are not specified in this Conformance Statement.

Important remarks about the exported images:
• Export of imported images can result in differences between imported and exported data.
• In case the remote system does not support a modality specific Image Storage SOP Class, CT will convert the images and sends them via the SC Image SOP Class. These Secondary Capture images and additional information (like graphics, text and important attribute information) are burnt-in (if configured). The original bit depth of the Secondary Capture image is kept.
• In case of color images, all color coding schemes are sent out just like they are received. However, the image handling is based on RGB color coding.
• CT does support standard DICOM overlays and curves.
• Exported CT images relate Scanogram and Slice images in the following way: Attribute 'Referenced Image Sequence' is present in the slice images and points to the related Scanogram image. Note that Attribute 'Frame of Reference UID' in the Scanogram (Localiser image) and related image slices are not guaranteed to be equal; this depends on the source of the images.

3.1.2.1.3.1   CT SCU Conformance

Table 3-4 list the applied Conditional (DICOM Type 1C and 2C) and Optional (DICOM Type 3) attributes in the CT Image IOD. These attributes are always present in the CT Images sent by the CT and created by the CT scanner. Imported images are only mentioned for viewing purposes

Table 3-4: Applied Conditional and Optional attributes of the CT IOD

IE	Module	Conditional attributes	Optional attributes
Patient	Patient	-	Referenced Patient Sequence
Study	General Study	-	Study Description, Referenced Study Sequence.
Series	General Series	Patient Position, Laterality.	Series Date, Series Time, Series Description, Performing Physician(s) Name, Operator's Name, Protocol Name, Referenced Study Component Sequence, Performed Procedure Step Date, Performed Procedure Step ID, Performed Procedure Step Time, Request Attribute Sequence, Scheduled Action Item Code Sequence, Scheduled Procedure Step ID, Requested Procedure ID

Table 3-4: Applied Conditional and Optional attributes of the CT IOD (Continued)

IE	Module	Conditional attributes	Optional attributes
Frame of Reference	Frame of Reference	-	-
Equipment	General Equipment	-	Institution Name, Station Name, Institutional Department Name, Manufacturer's Model name, Software Version(s), Date of last Calibration, Time of last Calibration.
Image	General Image	Image Date, Image Time	Referenced Image Sequence, Acquisition Date, Acquisition Time, Image Comments, Acquisition Number
	Image Plane	-	-
	Image Pixel	-	-
	Contrast/Bolus	-	-
	CT Image	-	Reconstruction Diameter, Gantry/Detector Tilt, Table Height, Exposure Time, X-Ray Tube Current, Exposure, Convolution Kernel.
	VOI LUT	Window Width	Window Center
	SOP Common	Specific Character Set, SOP Class UID, SOP Instance UID	-

This Paragraph will list the Modules and the Attributes in the CT Image IOD.

Table 3-5: Overview of the used Modules in the CT Image IOD

IE	Module	Reference
Patient	Patient	Table 3-6
Study	General Study	Table 3-7
Series	General Series	Table 3-8
Frame of Reference	Frame of Reference	Table 3-9
Equipment	General Equipment	Table 3-10

Table 3-5: Overview of the used Modules in the CT Image IOD

IE	Module	Reference
Image	General Image	Table 3-11
	Image Plane	Table 3-12
	Image Pixel	Table 3-13
	Contrast/Bolus	Table 3-14
	CT Image	Table 3-15
	VOI LUT	Table 3-16
	SOP Common	Table 3-17

Table 3-6: CT Image Storage SOP Class - Patient Module

Attribute Name	Tag	Note
Referenced Patient Sequence	0008,1120	Obtained from RIS.
> Referenced SOP Class UID	0008,1150	Obtained from RIS.
> Referenced SOP Instance UID	0008,1155	Obtained from RIS.
Patient's Name	0010,0010	Patient's full name. Obtained from RIS.
Patient ID	0010,0020	Primary hospital identification number or code for the patient. Obtained from RIS.
Patient's Birth Date	0010,0030	Birth date of the patient. Obtained from RIS.
Patient's Sex	0010,0040	Sex of the named patient Obtained from RIS. Applied value(s): F, M, O

Table 3-7: CT Image Storage SOP Class - General Study Module

Attribute Name	Tag	Note
Study Date	0008,0020	Date the Study started.
Study Time	0008,0030	Time the Study started.
Accession Number	0008,0050	Obtained from RIS.
Referring Physician's Name	0008,0090	Obtained from RIS.
Study Description	0008,1030	Value(s): /////
Referenced Study Sequence	0008,1110	Obtained from RIS.
> Referenced SOP Class UID	0008,1150	Obtained from RIS.

Table 3-7: CT Image Storage SOP Class - General Study Module (Continued)

Attribute Name	Tag	Note
> Referenced SOP Instance UID	0008,1155	Obtained from RIS.
Study Instance UID	0020,000D	Obtained from RIS.
Study ID	0020,0010	Empty.

Table 3-8: CT Image Storage SOP Class - General Series Module

Attribute Name	Tag	Note
Series Date	0008,0021	Date the Series started.
Series Time	0008,0031	Time the Series started.
Modality	0008,0060	Type of equipment that originally acquired the data used to create the images in this Series. Applied value(s): CT
Series Description	0008,103E	User provided description of the Series.
Performing Physician's Name	0008,1050	Empty.
Referenced Study Component Sequence	0008,1111	Obtained from RIS.
> Referenced SOP Class UID	0008,1150	Obtained from RIS.
> Referenced SOP Instance UID	0008,1155	Obtained from RIS.
Protocol Name	0018,1030	Pre-defined description of the conditions under which the Series was performed.
Patient Position	0018,5100	Patient position descriptor relative to the equipment. Applied value(s): FFDL, FFDR, FFP, FFS, HFDL, HFDR, HFP, HFS
Series Instance UID	0020,000E	Unique identifier of the Series.
Laterality	0020,0060	
Series Number	0020,0011	A number that identifies this Series.
Request Attributes Sequence	0040,0275	
> Scheduled Procedure Step Description	0040,0007	
> Scheduled Action Item Code Sequence	0040,0008	Obtained from RIS.
> Scheduled Procedure Step ID	0040,0008	Obtained from RIS.
> Requested Procedure ID	0040,1001	Obtained from RIS.

Table 3-8: CT Image Storage SOP Class - General Series Module (Continued)

Attribute Name	Tag	Note
Performed Procedure Step Date	0040,0244	
Performed Procedure Step Time	0040,0245	
Performed Procedure Step ID	0040,0253	Copied from Requested Procedure ID.

Table 3-9: CT Image Storage SOP Class - Frame of Reference Module

Attribute Name	Tag	Note
Frame of Reference UID	0020,0052	Uniquely identifies the frame of reference for a Series.
Position Reference Indicator	0020,1040	Always empty.

Table 3-10: CT Image Storage SOP Class - General Equipment Module

Attribute Name	Tag	Note
Manufacturer	0008,0070	Manufacturer of the equipment that produced the digital images. Applied value(s): Philips Medical Systems
Institution Name	0008,0080	Institution where the equipment is located that produced the digital images.
Station Name	0008,1010	User defined name identifying the machine that produced the digital images.
Institutional Department Name	0008,1040	Department in the institution where the equipment is located that produced the digital images.
Manufacturer's Model Name	0008,1090	Manufacturer's model Name. Applied value(s): "Philips CT Aura" or "Philips CT Secura"
Software Version(s)	0018,1020	Manufacturer's designation of software version of the equipment that produced the digital images. Applied value(s): CT backend 1.5
Date of Last Calibration	0018,1200	Date when the image acquisition device calibration was last changed in any way. Multiple entries may be used for additional calibrations at other times.
Time of Last Calibration	0018,1201	Time when the image device was last changed in any way. Multiple entries may be used.

Table 3-11: CT Image Storage SOP Class - General Image Module

Attribute Name	Tag	Note
Acquisition Date	0008,0022	
Image Date	0008,0023	The date the image pixel data creation started.
Acquisition Time	0008,0032	
Image Time	0008,0033	The time the image pixel data creation started.
Referenced Image Sequence	0008,1140	A sequence which provides reference to a set of Image SOP Class/Instance identifying other images significantly related to this image (e.g. post-localizer CT image)
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	
Acquisition Number	0020,0012	
Image Number	0020,0013	Acquisition Order.
Image Comments	0020,4000	

Table 3-12: CT Image Storage SOP Class - Image Plane Module

Attribute Name	Tag	Note
Slice Thickness	0018,0050	Nominal slice thickness, in mm
Image Position (Patient)	0020,0032	The x, y, and z coordinates of the upper left hand corner (first pixel transmitted) of the image, in mm.
Image Orientation (Patient)	0020,0037	The direction cosines of the first row and the first column with respect to the patient.
Slice Location	0020,1041	
Pixel Spacing	0028,0030	Physical distance in the patient between the center of each pixel, specified by a numeric pair - adjacent row spacing (delimiter) adjacent column spacing in mm.

Table 3-13: CT Image Storage SOP Class - Image Pixel Module

Attribute Name	Tag	Note
Samples per Pixel	0028,0002	Number of samples (planes) in this image. Applied value(s): 1

Table 3-13: CT Image Storage SOP Class - Image Pixel Module (Continued)

Attribute Name	Tag	Note
Photometric Interpretation	0028,0004	Specifies the intended interpretation of the pixel data. Applied value(s): MONOCHROME2
Rows	0028,0010	Number of rows in the image.
Columns	0028,0011	Number of columns in the image.
Bits Allocated	0028,0100	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. Applied value(s): 16
Bits Stored	0028,0101	Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored. Applied value(s): 12
High Bit	0028,0102	Most significant bit for pixel sample data. Each sample shall have the same high bit. Applied value(s): 11
Pixel Representation	0028,0103	Data representation of the pixel samples. Each sample shall have the same pixel representation. Applied value(s): 0000
Pixel Data	7FE0,0010	A data stream of the pixel samples which comprise the Image.

Table 3-14: CT Image Storage SOP Class - Contrast/Bolus Module

Attribute Name	Tag	Note
Contrast/Bolus Agent	0018,0010	If present always empty.

Table 3-15: CT Image Storage SOP Class - CT Image Module

Attribute Name	Tag	Note
Image Type	0008,0008	Image identification characteristics. Applied value(s): ORIGINAL \ PRIMARY \ AXIAL, LOCALIZER\VOLUME, SERIAL, DYNAMIC, SCANOGRAM, FLUORO
KVP	0018,0060	Applied kilo voltage output of the x-ray generator used.
Reconstruction Diameter	0018,1100	Diameter in mm of the region from within which data were used in creating the reconstruction of the image. (Field of View)
Gantry/Detector Tilt	0018,1120	Nominal angle of tilt in degrees of the scanning gantry.

Table 3-15: CT Image Storage SOP Class - CT Image Module (Continued)

Attribute Name	Tag	Note
Table Height	0018,1130	The distance in mm of the top of the patient table to an arbitrary reference point.
Exposure Time	0018,1150	Time of x-ray exposure in ms.
X-ray Tube Current	0018,1151	X-ray Tube Current in mA.
Exposure	0018,1152	The product of exposure time and X-ray Tube Current expressed in mAs.
Convolution Kernel	0018,1210	
Acquisition Number	0020,0012	A number identifying the single continuous gathering of data over a period of time which resulted in this image
Rescale Intercept	0028,1052	The value b in relationship between stored values (SV) and Hounsfield (HU). $HU = m*SV+b$. Applied value(s): -1200
Rescale Slope	0028,1053	m in the equation specified in Rescale Intercept.

Table 3-16: CT Image Storage SOP Class - VOI LUT Module

Attribute Name	Tag	Note
Window Center	0028,1050	Window Center for display.
Window Width	0028,1051	Window Width for display.

Table 3-17: CT Image Storage SOP Class - SOP Common Module

Attribute Name	Tag	Note
Specific Character Set	0008,0005	Character Set that expands or replaces the Basic Graphic Set. Applied value(s): ISO_IR 100
SOP Class UID	0008,0016	Uniquely identifies the SOP Class. Applied value(s): 1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	0008,0018	Uniquely identifies the SOP Instance.

3.1.2.1.3.2   SC SCU Conformance

Table 3-4 list the applied Conditional (DICOM Type 1C and 2C) and Optional (DICOM Type 3) attributes in the SC Image IOD. These attributes are always present in the SC Images send by the CT.

Table 3-18: Applied Conditional and Optional Attributes of the SC Image IOD

Information Entity	Module	Conditional Attributes	Optional Attributes
Patient	Patient	-	Referenced Patient Sequence
Study	General Study	-	Referenced Study Sequence, Study Description.
Series	General Series	Laterality	Series Date, Series Time, Series Description, Protocol Name, Performing Physician's Name, Referenced Study Component Sequence, Performed Procedure Step Date, Performed Procedure Step ID, Performed Procedure Step Time, Request Attribute Sequence, Scheduled Action Item Code Sequence, Requested Procedure ID, Patient position.
Equipment	General Equipment	-	Institution Name, Manufacturer's Model Name, Software Version(s), Date of Last Calibration, Time of Last Calibration, Institutional Department Name, Station Name.
	SC Equipment	-	-
Image	General Image	Patient Orientation, Image Date, Image Time	Image Type, Acquisition Date, Acqui.sition Time, Images in Acquisition, Image Comments, Acquisition Number
	Image Pixel	-	-
	SC Image	-	-
	Modality LUT	Rescale Intercept, Rescale Slope, Rescale Type	-
	VOI LUT	Window Width	Window Center
	SOP Common	Specific Character Set	-

This Paragraph will list the Modules and the Attributes in the SC Image IOD.

Table 3-19: Applied Conditional and Optional Attributes of the SC Image IOD

Information Entity	Module	References
Patient	Patient	Table 3-20
Study	General Study	Table 3-22
Series	General Series	Table 3-21
Equipment	General Equipment	Table 3-23
	SC Equipment	Table 3-24
Image	General Image	Table 3-25
	Image Pixel	Table 3-26
	Modality LUT	Table 3-27
	VOI LUT	Table 3-28
	SOP Common	Table 3-29

Table 3-20: Secondary Capture Image Storage SOP Class - Patient Module

Attribute Name	Tag	Note
Referenced Patient Sequence	0008,1120	Obtained from RIS.
> Referenced SOP Class UID	0008,1150	Obtained from RIS.
> Referenced SOP Instance UID	0008,1155	Obtained from RIS.
Patient's Name	0010,0010	Patient's full name. Obtained from RIS.
Patient ID	0010,0020	Primary hospital identification number or code for the patient. Obtained from RIS.
Patient's Birth Date	0010,0030	Birth time of the Patient. Obtained from RIS.
Patient's Sex	0010,0040	Sex of the named Patient. Obtained from RIS.

Table 3-21: Secondary Capture Image Storage SOP Class - General Study Module

Attribute Name	Tag	Note
Study Date	0008,0020	Date the Study started.
Study Time	0008,0030	Time the Study started.
Accession Number	0008,0050	

Table 3-21: Secondary Capture Image Storage SOP Class - General Study Module (Continued)

Attribute Name	Tag	Note
Referring Physician's Name	0008,0090	Patient's referring physician
Study Description	0008,1030	
Referenced Study Sequence	0008,1110	Obtained from RIS.
> Referenced SOP Class UID	0008,1150	Obtained from RIS.
> Referenced SOP Instance UID	0008,1155	Obtained from RIS.
Study Instance UID	0020,000D	Unique identifier for the Study.
Study ID	0020,0010	Always Empty

Table 3-22: Secondary Capture Image Storage SOP Class - General Series Module

Attribute Name	Tag	Note
Series Date	0008,0021	Date the Series started.
Series Time	0008,0031	Time the Series started.
Modality	0008,0060	Type of equipment that originally acquired the data used to create the images in this Series.
Series Description	0008,103E	
Protocol Name	0018,1030	
Performing Physician's Name	0008,1050	Name of the physicians administering the Series.
Referenced Study Component Sequence	0008,1111	Obtained from RIS.
> Referenced SOP Class UID	0008,1150	Obtained from RIS.
> Referenced SOP Instance UID	0008,1155	Obtained from RIS.
Patient Position	0018,5100	
Series Instance UID	0020,000E	Unique identifier of the Series.
Series Number	0020,0011	A number that identifies this Series.
Laterality	0020,0060	
Request Attributes Sequence	0040,0275	
> Scheduled Procedure Step Description	0040,0007	Obtained from RIS.
> Scheduled Action Item Code Sequence	0040,0008	Obtained from RIS.
> Requested Procedure ID	0040,1001	Obtained from RIS.

Table 3-22: Secondary Capture Image Storage SOP Class - General Series Module (Continued)

Attribute Name	Tag	Note
Performed Procedure Step Date	0040,0244	
Performed Procedure Step Time	0040,0245	
Performed Procedure Step ID	0040,0253	Copied from Requested Procedure ID.

Table 3-23: Secondary Capture Image Storage SOP Class - General Equipment Module

Attribute Name	Tag	Note
Station Name	0008,0033	
Manufacturer	0008,0070	Manufacturer of the equipment that produced the digital images.
Institution Name	0008,0080	Institution where the equipment is located that produced the digital images.
Institutional Department Name	0008,1040	
Manufacturer's Model Name	0008,1090	Manufacturer's model number of the equipment that produced the digital images. Applied Value(s): "Philips CT Aura" or "Philips CT Secura"
Software Version(s)	0018,1020	Manufacturer's designation of software version of the equipment that produced the digital images. Applied value(s): CT Backend 1.5
Date of Last Calibration	0018,1200	
Time of Last Calibration	0018,1201	

Table 3-24: Secondary Capture Image Storage SOP Class - SC Equipment Module

Attribute Name	Tag	Note
Conversion Type	0008,0064	Describes the kind of image conversion. Applied value(s): DV

Table 3-25: Secondary Capture Image Storage SOP Class - General Image Module

Attribute Name	Tag	Note
Image Type	0008,0008	Image identification characteristics.

Table 3-25: Secondary Capture Image Storage SOP Class - General Image Module (Continued)

Attribute Name	Tag	Note
Acquisition Date	0008,0022	The date the acquisition of data that resulted in this image started.
Image Date	0008,0023	The date the image pixel data creation started.
Acquisition Time	0008,0032	
Image Time	0008,0033	The time the image pixel data creation started.
Acquisition Number	0020,0012	
Image Number	0020,0013	A number that identifies this image.
Image Comments	0020,4000	

Table 3-26: Secondary Capture Image Storage SOP Class - Image Pixel Module

Attribute Name	Tag	Note
Samples per Pixel	0028,0002	Number of samples (planes) in this image.
Photometric Interpretation	0028,0004	Specifies the intended interpretation of the pixel data.
Rows	0028,0010	Number of rows in the image.
Columns	0028,0011	Number of columns in the image.
Bits Allocated	0028,0100	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated.
Bits Stored	0028,0101	Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored.
High Bit	0028,0102	Most significant bit for pixel sample data. Each sample shall have the same high bit.
Pixel Representation	0028,0103	Data representation of the pixel samples. Each sample shall have the same pixel representation. Applied value(s): 0000
Pixel Data	7FE0,0010	A data stream of the pixel samples which comprise the Image.

Table 3-27: Secondary Capture Image Storage SOP Class - Modality LUT Module

Attribute Name	Tag	Note
Rescale Intercept	0028,1052	
Rescale Slope	0028,1053	
Rescale Type	0028,1054	

Table 3-28: Secondary Capture Image Storage SOP Class - VOI LUT Module

Attribute Name	Tag	Note
Window Center	0028,1050	Window Center for display.
Window Width	0028,1051	Window Width for display.

Table 3-29: Secondary Capture Image Storage SOP Class - SOP Common Module

Attribute Name	Tag	Note
Specific Character Set	0008,0005	Character Set that expands or replaces the Basic Graphic Set.
SOP Class UID	0008,0016	Uniquely identifies the SOP Class. Applied value(s): 1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	0008,0018	Uniquely identifies the SOP Instance.

3.1.2.2 Query a Remote Database

3.1.2.2.1   Associated Real-World Activity

The operator queries a remote database by means of the query tool in the CT data handling facility. The CT initiates an Association to the selected peer entity and uses it to send C-FIND requests (and receive the associated find replies). The Association is released when the find execution completes.

3.1.2.2.2   Proposed Presentation Contexts

The CT will propose the presentation contexts as given in the next table.

Table 3-30: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCU	None
See Note	See Note	ELE	1.2.840.10008.1.2.1	SCU	None
See Note	See Note	EBE	1.2.840.10008.1.2.2	SCU	None

Note: All Query/Retrieve FIND SOP Classes from Table 3-1, "Supported SOP classes by the CT AE as SCU," on page 11.

3.1.2.2.3   C-FIND SCU Conformance

The CT will not generate queries containing optional keys. The CT will not generate relational queries.

3.1.2.3 Retrieve Images from a Remote Database

3.1.2.3.1   Associated Real-World Activity

The operator is able to copy all/selected images in a patient folder from a remote database to another, local or remote, database by means of the copy tool in the CT data handling facility. The CT initiates for each selected study an Association to the selected peer entity and uses it to send C-MOVE requests (and receive the associated move replies). The Association is released when all selected images have been transmitted.

3.1.2.3.2   Proposed Presentation Contexts

The CT will propose the presentation contexts as given in the next table.

Table 3-31: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCU	None
See Note	See Note	ELE	1.2.840.10008.1.2.1	SCU	None
See Note	See Note	EBE	1.2.840.10008.1.2.2	SCU	None

Note: All Query/Retrieve MOVE SOP Classes from Table 3-1, "Supported SOP classes by the CT AE as SCU," on page 11.

3.1.2.3.3   C-MOVE SCU Conformance

The AE provides standard conformance.

3.1.2.4 Storage Commitment

3.1.2.4.1   Associated Real-World Activity

The CT accepts Associations from systems that wish to Storage Commit.

3.1.2.4.2   Presentation Context Table

The CT will propose the presentation contexts as given in the next table.

Table 3-32: Proposed Presentation Contexts

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	ILE	1.2.840.10008.1.2	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	ELE	1.2.840.10008.1.2.1	SCU	None
Storage Commitment Push Model	1.2.840.10008.1.20.1	EBE	1.2.840.10008.1.2.2	SCU	None

3.1.2.4.3   Storage Commitment Push SCU Conformance

The CT provides standard conformance.

3.1.2.5 Print images

3.1.2.5.1   Associated Real-World Activity

There are two ways to request for image printing:
- Print Compose
  The operator is able to select one or more images from the internal database (via the Data Handling facility) and perform the Print operation on them.
- Print Protocol
  The operator is also able to print images via the various clinical applications of the CT.

The operator will select the print destination (out of choice list of configured printers) and some print parameters (depending on the configuration and the selected printer).
As a result, the CT will initiate an association to the selected printer and use(s) it to send the Print Service Elements of the Print SOP Classes.

The CT allows to have a print preview first.

3.1.2.5.2   Proposed Presentation Contexts

The CT will propose the presentation contexts as given in the next table.

Table 3-33: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCU	None
See Note	See Note	ELE	1.2.840.10008.1.2.1	SCU	None
See Note	See Note	EBE	1.2.840.10008.1.2.2	SCU	None

Note: All Print SOP Classes from Table 3-1, "Supported SOP classes by the CT AE as SCU," on page 11.

3.1.2.5.3   Conformance to the Print SOP Classes

The CT provides standard conformance to the Basic Grayscale Print Management Meta SOP Class.

The applied order of Print Service Elements (DIMSE's) is specified in Table 3-34. A description and the applied optional (i.e. non-mandatory attributes as Print SCU) attributes in these Service Elements are specified too. Note that the Service Elements order is not specified by the DICOM standard.

An explicit N-DELETE Request on the created instances is not done by the CT; these are deleted implicitly when releasing the association.

Overlay, Annotation (showing the values of some major identifying attributes) and Shutter information is processed in the images sent to the printer (i.e. burnt in the image).

The **full list of (Mandatory and Optional) attributes** applied in these Service Elements are given in section 3.1.2.5.3 on page 32.

Table 3-34: The applied order of Print Service Elements and its optional attributes

Service Element of SOP Class	Description and applied optional attributes
N-GET of the Printer SOP Class	Purpose is to retrieve printer information.
N-CREATE of the Basic Film Session SOP Class	The CT specifies the DICOM Printer about some general presentation parameters, applicable for all films in the Film Session. Applied optional attributes are: Number of Copies, Print Priority, Medium Type, Film Destination
N-CREATE of the Basic Film Box SOP Class	The CT specifies the DICOM Printer about some general presentation parameters, applicable for all images in the Film Box. Applied optional attributes are: Film Orientation, Film Size ID, Magnification Type, Max. Density, Configuration Information, Trim.
N-SET of the Basic Grayscale/ Color Image Box SOP Class	The CT will send the images to be printed. Applied optional attributes are: Polarity
N-ACTION of the Basic Film Box SOP Class	The CT triggers the DICOM Printer to print, this actual print action is done at film box level. No (optional) attributes are present.

The table below specifies the supported Service Elements which may be generated by the Printer at any time during the association.

Table 3-35: The applied sequence of Print Service Elements and its optional attributes

Service Element of SOP Class	Note
N-EVENT-REPORT of the Printer SOP Class	May be sent at any moment by the Printer SCP (i.e. the DICOM Printer). The CT will ignore the contents of these events. However, the printer status is polled via a separate association, see section See 3.1.2.6.

The Status Codes of DIMSE Responses (Success, Warning, Failure) as returned by the printer will also be logged (for service purposes) and are mapped onto general print job status messages towards the operator. These User Interface messages indicate:
• "Job Completed" and has the meaning that the print job is accepted by the printer; the actual printing will be done afterwards.
• "General Print Error" indicating that a failure occurred during the DICOM Print. Also, most warning cases (like default printer values applied on optional print attributes) are interpreted as a print error because this will mostly result in a different print quality or print layout than expected.

The following implementation remarks are important to achieve successful printing:
- The number of Film Boxes per Film Session is **one**.
- The number of images per Film Box is **one**.
  The images to be printed on one film are rendered by the CT into one logical image. This logical image is very large, depending on the pixel matrix size (pixels per line, lines per image), use of color or not. A rough indication is 20 MByte. One should take this into account when selecting the DICOM printer and the printer configuration (e.g. the amount of memory).
- The CT will release the association when the print command is given (i.e. the N-ACTION Request); the association is not kept open for receiving N-EVENT-REPORTs of the Printer SOP Class.
- On status-errors/warnings in a DIMSE response, the datatransfer will be stopped and film will not be printed.

This section gives an overview of the applied attributes in the applied Service Elements of the supported SOP Classes.
Note that not all Service Elements of the SOP Classes are applied, see also section 3.1.2.5.3 on page 32. For the order of sending these Service Elements, see that same section.

The list of possible attribute values are given (if applicable). The situation that an attribute is present conditionally. The standard DICOM Conditions and Defined Terms and Enumerated Values are applicable.

3.1.2.5.3.1   Basic Film Session SOP Class

Table 3-36: Basic Film Session SOP Class - N-CREATE

Attribute Name	Tag	Note
Number of Copies	2000,0010	Between 1 and 99.
Print Priority	2000,0020	Applied value(s): HIGH
Medium Type	2000,0030	Applied value(s): BLUE FILM, CLEAR FILM, PAPER
Film Destination	2000,0040	Applied value(s): MAGAZINE, PROCESSOR

3.1.2.5.3.2   Basic Film Box SOP Class

Table 3-37: Basic Film Box SOP Class - N-CREATE

Attribute Name	Tag	Note
Image Display Format	2010,0010	The applied value below is a CT specific value indicating that one (large) image is contained in a Film Box. Applied value(s): CUSTOM\1, STANDARD\1,1 (I is a vendor specific index, i.e.an integer) is applied if the Standard Image Display Format does not result in acceptable films. Purpose of this value is to use the film surface as much as possible for image printing (and avoid large margins). This should be agreed per printer vendor.
Film Orientation	2010,0040	Applied value(s): LANDSCAPE, PORTRAIT
Film Size ID	2010,0050	DICOM specifies a number of Defined Terms; more values are possible and is print configuration dependent.
Magnification Type	2010,0060	Normally sent out, however sometimes send out empty because some DICOM printers are not able to handle (value NONE for) this attribute. Applied value(s): NONE
Trim	2010,0140	
Configuration Information	2010,0150	Contains a vendor specific Lookup-table (LUT); should be applied by the DICOM printer if LUT data is present.

Table 3-38: Basic Film Box SOP Class - Basic Film Box Relationship Module

Attribute Name	Tag	Note
Referenced Film Session Sequence	2010,0500	Parent Film Session.
> Referenced SOP Class UID	0008,1150	
> Referenced SOP Instance UID	0008,1155	

Table 3-39: Basic Film Box SOP Class - N-ACTION

Attribute Name	Tag	Note
No attributes present		

3.1.2.5.3.3   Basic Grayscale Image Box SOP Class

Table 3-40: Basic Grayscale Image Box SOP Class - N-SET

Attribute Name	Tag	Note
Image Position	2020,0010	Applied value(s): 1
Polarity	2020,0020	Applied value(s): NORMAL
Preformatted Grayscale Image Sequence	2020,0110	
> Samples per Pixel	0028,0002	Applied value(s): 1
> Photometric Interpretation	0028,0004	Applied value(s): MONOCHROME2
> Rows	0028,0010	Depending on the selected printer type and film size.
> Columns	0028,0011	Depending on the selected printer type and film size.
> Bits Allocated	0028,0100	Applied value(s): 16, 8
> Bits Stored	0028,0101	Applied value(s): 12, 8
> High Bit	0028,0102	Applied value(s): 11, 7
> Pixel Representation	0028,0103	Applied value(s): 0x0000
> Pixel Data	7FE0,0010	

3.1.2.5.3.4   Color Grayscale Image Box SOP Class

Table 3-41: Basic Color Image Box SOP Class - Image Box Pixel Presentation Module

Attribute Name	Tag	Note
Image Position	2020,0010	Applied value(s): 1
Polarity	2020,0020	Applied value(s): NORMAL
Preformatted Color Image Sequence	2020,0111	
> Samples per Pixel	0028,0002	Applied value(s): 3
> Photometric Interpretation	0028,0004	Applied value(s): RGB
> Planar Configuration	0028,0006	Applied value(s): 0000, 0001 0000, is not interleaved, 0001, frame interleaved.
> Rows	0028,0010	
> Columns	0028,0011	Depending on the selected printer type and film size.
> Bits Allocated	0028,0100	Applied value(s): 8
> Bits Stored	0028,0101	Applied value(s): 8
> High Bit	0028,0102	Applied value(s): 7
> Pixel Representation	0028,0103	Applied value(s): 0000

Table 3-41: Basic Color Image Box SOP Class - Image Box Pixel Presentation Module (Continued)

Attribute Name	Tag	Note
> Pixel Data	7FE0,0010	

The CT does not send an attribute list to the printer, therefore the only attributes which are needed to be supported by the printer, are the mandatory attributes listed in Table 3-43, "Printer SOP Class - N-GET," on page 38.

3.1.2.6 Request for the Printer Status

3.1.2.6.1   Associated Real-World Activity

The CT will periodically (every 10 seconds) request for the printer status. This is only done when no association is set-up for a print job. In case of a print job association the printer status is requested in that association.

The received printer status is displayed in the Printer Status Tool.

3.1.2.6.2   Proposed Presentation Contexts

The CT will propose the presentation contexts as given in: Table 3-33, "Proposed Presentation Contexts," on page 32.

3.1.2.6.3   Conformance to the Printer SOP Class

The CT provides standard conformance to this SOP Class.

The applied optional attributes in the N-GET Service Element are specified in Table 3-42. The **detailed list of (Mandatory and Optional) attributes** applied in this Service Element is given in section 3.1.2.5.3 on page 32.

Table 3-42: The applied optional attributes in the N-GET Service Element

Service Element of SOP Class	Note
N-GET of the Printer SOP Class	Purpose is to retrieve printer information. Applied optional attributes are: Printer Status, Printer Status Info, Printer Name, Manufacturer, Manufacturer Model Name

The Status Codes of Printer N-GET Responses (Success, Warning, Failure) as returned by the printer will also be logged (for service purposes) and are not indicated towards the operator.

Table 3-43: Printer SOP Class - N-GET

Attribute Name	Tag	Note
Printer Status	2110,0010	
Printer Status Info	2110,0020	

Table 3-44: Printer SOP Class - N-EVENT-REPORT[a]

Attribute Name	Tag	Note
Printer Status Info	2110,0020	Conditionally sent by the Printer. The CT will ignore this status information. However, polling this status via the N-GET Service Element is done.

a. This Service Element is sent by the printer and interpreted by the CT.

3.1.3 Association Acceptance Policy

The CT accepts Associations for the following purposes:
- To allow remote applications to verify application level communication with the CT, see section 3.1.3.1 on page 39;
- To allow remote applications to store CT, X-Ray, SC and MR images in the CT database (i.e. image import), see section 3.1.3.2 on page 40;

The CT Application Entity rejects Association requests from unknown applications, i.e. applications that offer an unknown "calling AE title". An application is known if and only if it is defined during configuration of the CT system.

The CT Application Entity rejects Association requests from applications that do not address the CT AE, i.e. that offer a wrong "called AE title". The CT AE title is defined during configuration of the CT system.

Any of the presentation contexts shown in Table 3-30 are acceptable.

3.1.3.1 Verify Application Level Communication

3.1.3.1.1   Associated Real-World Activity

The CT accepts Associations from systems that wish to verify application level communication using the C-ECHO command.

3.1.3.1.2   Presentation Context Table

The CT accepts all contexts in the intersection of the proposed and acceptable Presentation Contexts. This means that multiple proposed Presentation Contexts with the same SOP Class but different Transfer Syntaxes are accepted by the CT.

There is no check for duplicate contexts and are therefore accepted.

The CT will accept the presentation contexts as given in the next table.

Table 3-45: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Verification	1.2.840.10008.1.1	ILE	1.2.840.10008.1.2	SCU	None
Verification	1.2.840.10008.1.1	ELE	1.2.840.10008.1.2.1	SCU	None
Verification	1.2.840.10008.1.1	EBE	1.2.840.10008.1.2.2	SCU	None

3.1.3.1.3   C-ECHO SCP Conformance

The CT provides standard conformance.

3.1.3.2 Store Images in the CT Database (i.e. Image Import)

3.1.3.2.1   Associated Real-World Activity

The CT accepts Associations from systems that wish to store images in the CT database using the C-STORE command.

3.1.3.2.2   Presentation Context Table

Following presentation contexts are accepted:

Table 3-46: Proposed Presentation Contexts for CT

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE ELE EBE JPEG Baseline (Process 1) JPEG Extended (Process 2 & 4) JPEG Lossless, Non-Hierarchical (Process 14) JPEG Lossless, Hierarchical, First-Order Prediction	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.57 1.2.840.10008.1.2.4.70	SCP	None

Note: Any of the Standard Image Storage and Private SOP classes listed in Table 3-2, "Supported SOP classes by the CT AE as SCP," on page 12. For performance reasons the EBE is preferred.

3.1.3.2.3   C-STORE SCP Conformance

Options:

The CT provides level 2 (Full) conformance for the Storage Service Class. In the event of a successful C-STORE operation, the image has been stored in the CT database. The duration of the storage of the image is determined by the operator of the CT system.

If CT receives improper DICOM, CT tries as much as possible (if configured so), to make them proper DICOM. However, the CT also tries to remain as transparent on images as possible. So, on export the images must be changed only as far as really necessary.

Therefore, not guaranteed all DICOM violations of incoming images are repaired (e.g. attributes as one with enumerated values, are not changed). So, improper DICOM input to the CT can result in improper DICOM output.

Error handling:

The C-STORE is unsuccessful if CT returns one of the following status codes:
- A700 - Indicates the database is full. Recovery from this condition is left to the Service Class User.
- A900 - Indicates that the SOP class of the image does not match the abstract syntax negotiated for the presentation context.
- C000 - Indicates that the image cannot be parsed.

3.1.3.3 Query local Database

3.1.3.3.1   Associated Real-World Activity

The CT accepts Associations from systems that wish to query the CT database using the C-FIND command.

3.1.3.3.2   Presentation Context Table

The CT will accept the presentation contexts as given in the next table.

Table 3-47: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCP	None
See Note	See Note	ELE	1.2.840.10008.1.2.1	SCP	None
See Note	See Note	EBE	1.2.840.10008.1.2.2	SCP	None

Note: All Query/Retrieve FIND SOP Classes from Table 3-2, "Supported SOP classes by the CT AE as SCP," on page 12.

3.1.3.3.3   C-FIND SCP Conformance

The CT provides standard conformance. Optional keys are not supported. Relational queries are not supported. The CT simultaneously handles simultaneous C-FIND requests.

The CT database distinguishes two patients with the same Patient ID but different Patient Name or Patient Birth Date. Because the DICOM Query model has Patient ID as Unique Key at patient level, two patients with the same Patient ID cannot be distinguished via the DICOM Standard Query SOP Class.

3.1.3.4 Retrieve Images from a local Database

3.1.3.4.1   Associated Real-World Activity

The CT accepts Associations from systems that wish to retrieve images from the CT database using the C-MOVE command.

3.1.3.4.2   Presentation Context Table

The CT will accept the presentation contexts as given in the next table.

Table 3-48: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
See Note	See Note	ILE	1.2.840.10008.1.2	SCP	None
See Note	See Note	ELE	1.2.840.10008.1.2.1	SCP	None
See Note	See Note	EBE	1.2.840.10008.1.2.2	SCP	None

Note: All Query/Retrieve MOVE SOP Classes from Table 3-2, "Supported SOP classes by the CT AE as SCP," on page 12.

3.1.3.4.3   C-MOVE SCP Conformance

The CT supports all the Storage SOP classes listed in Table 3-1.
The CT does not send Intermediate C-MOVE response with status pending.

Network capabilities of the CT DICOM Application Entity are specified in section 3.1 and the Media capabilities are specified in section 3.3.

3.2 CT AE RIS Specification

The CT Application Entity provides Standard Conformance to the DICOM V3.0 SOP classes as an SCU specified in Table 3-49.

Table 3-49: Supported SOP classes by the CT RIS AE as SCU

SOP class Name	UID
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3
Modality Worklist Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31

3.2.1 Association Establishment Policies

3.2.1.1 General

The CT as SCU will offer unrestricted maximum PDU size on Associations initiated by the CT itself. This is also configurable per remote station. The CT as SCP will offer the same PDU size as offered on Associations initiated by remote applications (SCU), this is not configurable, and will then use that same value as its own maximum PDU size.

3.2.1.2 Number of Associations

As SCU: As a result of local activities, the CT can initiate a 1 simultaneous Associations for each of the following services:
• WLM
• MPPS

3.2.1.3 Asynchronous Nature

The CT does not support asynchronous operations and will not perform asynchronous window negotiation.

3.2.1.4 Implementation Identifying Information

The Implementation Class UID is: 1.3.46.670589.10.20.800143.3
The implementation version name is: CT backend 1.5L1

3.2.2 Association Initiation Policy

The CT initiates Associations as a result of the following events:
• Query WLM
• Start Exam (MPPS)
• Finish Exam (MPPS)

3.2.2.1 Request to send MPPS

3.2.2.1.1   Associated Real-World Activity

MPPS and WLM are done in parallel.

3.2.2.1.2   Proposed Presentation Contexts

The CT will propose the presentation contexts as given in the next table.

Table 3-50: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Performed Procedure Step SOP Class	1.2.840.10008.3.1.2.3.3	ILE	1.2.840.10008.1.2	SCU	None

3.2.2.1.3   Modality Performed Procedure Step Conformance

The Modality Performed procedure Step signals the RIS/HIS that a procedure has been finished and will provide the HIS/RIS with data concerning this Performed procedure.

3.2.2.1.3.1   MPPS IOD attribute Overview, N-CREATE

The shaded boxes contain values which contents are obtained from the RIS/HIS via the Modality Worklist Query/Retrieve.

Table 3-51: Modality Performed Procedure Step IOD N-CREATE

Module	Reference
Image Acquisition Result	Table 3-52
Performed Procedure Step Information	Table 3-53
Performed Procedure Step Relationship	Table 3-54

Table 3-52: Modality Performed Procedure Step SOP Class - Image Acquisition Result Module

Attribute Name	Tag	Note
Modality	0008,0060	Type of equipment that originally acquired the data used to create the images associated with this Modality Performed Procedure Step. Applied value(s): CT
Study ID	0020,0010	User or equipment generated Study Identifier. Equals: Empty.

Table 3-52: Modality Performed Procedure Step SOP Class - Image Acquisition Result Module (Continued)

Attribute Name	Tag	Note
Performed Action Item Sequence	0040,0260	Sequence describing the Action Items performed for this Procedure Step. Always zero length.
Performed Series Sequence	0040,0340	Attributes of the Series that comprise this Modality Performed Procedure Step. Always empty.

Table 3-53: Modality Performed Procedure Step SOP Class - Performed Procedure Step Information Module

Attribute Name	Tag	Note
Procedure Code Sequence	0008,1032	A sequence that conveys the (single) type of procedure performed. Always zero length.
Performed Station AE Title	0040,0241	AE Title of the modality in which the preformed procedure Step was performed.
Performed Station Name	0040,0242	An institution defined name for the modality on which the Performed Procedure was performed. Always empty.
Performed Location	0040,0243	Description of the location at which the Performed Procedure Step was performed. Always zero length.
Performed Procedure Step Start Date	0040,0244	Date on which the Performed Procedure Step started.
Performed Procedure Step Start Time	0040,0245	Time on which the Performed Procedure Step started.
Performed Procedure Step End Date	0040,0250	Always Empty.
Performed Procedure Step End Time	0040,0251	Always Empty.
Performed Procedure Step Status	0040,0252	Contains the state of the Performed Procedure Step. Applied value(s): IN PROGRESS
Performed Procedure Step ID	0040,0253	User or equipment generated identifier of that part of a Procedure that has been carried out within this step.
Performed Procedure Step Description	0040,0254	A description of the type of procedure performed. Always zero length.
Performed Procedure Type Description	0040,0255	Institution-generated description or classification of the Procedure Step that was performed. Always zero length.

Table 3-54: Modality Performed Procedure Step SOP Class - Performed Procedure Step Relationship Module

Attribute Name	Tag	Note
Patient's Name	0010,0010	Patient's full legal name.
Patient ID	0010,0020	Primary hospital identification number or code for the patient.
Patient's Birth Date	0010,0030	Birth date of the patient.
Patient's Sex	0010,0040	Sex of the named patient. Applied value(s): F, M, O
Referenced Patient Sequence	0008,1120	Uniquely identifies the Patient SOP Instance. Zero length.
Scheduled Step Attributes Sequence	0040,0270	Sequence containing attributes that are related to the scheduling of the Procedure Step.
> Accession Number	0008,0050	A departmental generated number which identifies the order for the Study.
> Referenced Study Sequence	0008,1110	Uniquely identifies the Study SOP Instance associated with this Scheduled Procedure Step. Zero length.
> Study Instance UID	0020,000D	Unique identifier for the Study.
> Requested Procedure Description	0032,1060	Institution-generated administrative description or classification of the Requested procedure.
> Scheduled Procedure Step Description	0040,0007	Institution-generated description or classification of the Scheduled Procedure Step to be performed.
> Scheduled Action Item Code Sequence	0040,0008	Sequence describing the Scheduled Action Item(s) following a specified coding scheme.
>> Code Value	0008,0100	
>> Coding Scheme Designator	0008,0102	
>> Code Meaning	0008,0104	
> Scheduled Procedure Step ID	0040,0009	Identifier which identifies the Scheduled Procedure Step.
> Requested Procedure ID	0040,1001	Identifier which identifies the Requested Procedure in the Imaging Service Request.
> Performed Series Sequence	0040,0340	Zero Length.

3.2.2.1.3.2   MPPS IOD attribute Overview, N-SET

Table 3-55: Modality Performed Procedure Step IOD N-SET

Module	Reference
Image Acquisition Result Module	Table 3-56
Performed Procedure Step Information	Table 3-57

Table 3-56: Modality Performed Procedure Step SOP Class - Image Acquisition Result Module

Attribute Name	Tag	Note
Performed Series Sequence	0040,0340	Attributes of the Series that comprise this Modality Performed Procedure Step.
> Retrieve AE Title	0008,0054	Title of the DICOM Application Entity where the Images and Standalone SOP Instances in this Series may be retrieved on the Network.
> Series Description	0008,103E	User provided description of the Series.
> Performing Physician's Name	0008,1050	Name of the physician administering this Series. Equals: Empty.
> Operator's name	0008,1070	Name of the operator who performed this Series. Always zero length. Equals: Empty.
> Referenced Image Sequence	0008,1140	A Sequence that provides reference to zero or more sets of Image SOP Class/Sop Instance pairs.
>> Referenced SOP Class UID	0008,1150	1.2.840.100008.5.1.4.1.1.2
>> Referenced SOP Instance UID	0008,1155	Uniquely identifies the referenced SOP Instance.
> Protocol Name	0018,1030	User-defined description of the conditions under which the Series was performed.
> Series Instance UID	0020,000E	Unique identifier of the Series.
>Referenced Standalone SOP Instance Sequence	0040,0220	Unique identifies standalone IOD's, related to these images. Always empty.

Table 3-57: Modality Performed Procedure Step SOP Class - Performed Procedure Step Information Module

Attribute Name	Tag	Note
Performed Procedure Step Status	0040,0252	Applied value(s): COMPLETED
Performed Procedure Step End Date	0040,0250	Always Empty.

Table 3-57: Modality Performed Procedure Step SOP Class - Performed Procedure Step Information Module (Continued)

Attribute Name	Tag	Note
Performed Procedure Step End Time	0040,0251	Always Empty.

3.2.2.2 Request to receive WLM data

3.2.2.2.1   Associated Real-World Activity

MPPS and WLM are done in parallel.

3.2.2.2.2   Proposed Presentation Contexts

The CT will propose the presentation contexts as given in the next table.

Table 3-58: Proposed Presentation Contexts

Presentation Context table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Modality Work-list Information Model - FIND SOP Class	1.2.840.10008.5.1.4.31	ILE	1.2.840.10008.1.2	SCU	None

3.2.2.2.3   Modality Worklist Query/Retrieve Conformance

The CT system automatically filters the information received from the RIS. This means that these record aren't in the Worklist presented on the CT console. Filtering is based on two events:
• The acquisition is performed and a MPPS request is send back to the RIS
• The user delete a worklist entry on the console.

Table 3-59: Modality Worklist Query/Retrieve Information Model

Module	Reference
Patient Identification	Table 3-60
Patient Demographic	Table 3-61
Visit Relationship	Table 3-62
Scheduled Procedure Step	Table 3-63
Requested Procedure	Table 3-64
Imaging Service Request	Table 3-65

Table 3-60: Modality Worklist Information Model - FIND SOP Class - Patient Identification Module

Attribute Name	Tag	Note
Patient's Name	0010,0010	
Patient ID	0010,0020	

Table 3-61: Modality Worklist Information Model - FIND SOP Class - Patient Demographic Module

Attribute Name	Tag	Note
Patient's Birth Date	0010,0030	
Patient's Sex	0010,0040	

Table 3-62: Modality Worklist Information Model - FIND SOP Class - Visit Relationship Module

Attribute Name	Tag	Note
Referenced Patient Sequence	0008,1120	

Table 3-63: Modality Worklist Information Model - FIND SOP Class - Scheduled Procedure Step Module

Attribute Name	Tag	Note
Scheduled Procedure Step Sequence	0040,0100	
> Modality	0008,0060	CT
> Scheduled Station AE Title	0040,0001	Configured AE Title
> Scheduled Procedure Step Start Date	0040,0002	Date range or single current date. The date range is used in combination with a time range for the attribute Scheduled Procedure Step Start Time (0040,0003). The single current date is used in combination with an empty value for Scheduled Procedure Step Start Time.
> Scheduled Procedure Step Start Time	0040,0003	Time range or empty value. See note for Scheduled Procedure Step Start Date (0040,0002)
> Scheduled Procedure Step Description	0040,0007	
> Scheduled Action Item Code Sequence	0040,0008	
> Scheduled Procedure Step ID	0040,0009	
> Pre-Medication	0040,0012	
Medical Alerts	0010,2000	
Contrast Allergies	0010,2110	
Pregnancy Status	0010,21C0	
Special Needs	0038,0050	

Table 3-64: Modality Worklist Information Model - FIND SOP Class - Requested Procedure Module

Attribute Name	Tag	Note
Referenced Study Sequence	0008,1110	
Study Instance UID	0020,000D	
Requested Procedure Description	0032,1060	
Requested Procedure ID	0040,1001	

Table 3-65: Modality Worklist Information Model - FIND SOP Class - Imaging Service Request Module

Attribute Name	Tag	Note
Accession Number	0008,0050	
Referring Physician's Name	0008,0090	

3.2.3 Association Acceptance Policy

The CT RIS AE doesn't accept any associations.

3.3 The CT AE Media Specification

The CT AE provides Standard Conformance to the DICOM Media Storage Service and File Format (PS 3.10) and the Media Storage Application Profiles (PS 3.11), the General Purpose Application Profile, as far as the reading of uncompressed images on CD-Recordable medium is concerned.

The CT supports **multi-patient** and **multi-session** (both for reading and writing) CD-R disks.

The supported Application Profiles, their Roles and the Service Class (SC) options, all defined in DICOM terminology, are listed in Table 3-66.

Table 3-66: Application Profile, Activities and Roles of the DICOM Media part of the CT

Application Profile	Identifier	Real World Activity	Role	SC Option
General Purpose CD-R Image Interchange Profile	STD-GEN-CD	Display Directory of CD-R disk	FSR	Interchange
	STD-GEN-CD	Write image(s) on CD-R disk	FSC	Interchange
	STD-GEN-CD	Read image(s) from CD-R disk	FSR	Interchange

The same SOP Classes are supported as mentioned in Table 3-1 on page 11 (for Write) and Table 3-2 on page 12 (for Read) via this Application Profile.

3.3.1 File Meta Information

The (Source) Application Entity Title is specified in section 3.1.1.4 on page 13.
The Implementation Class UID and the Implementation Version Name in the File Meta Header is specified in section 3.1.1.4 on page 13.

3.3.2 Media related Real-World Activities

3.3.2.1 RWA Display Directory

The CT AE will act as a FSR when reading the directory of the medium. This will result in an overview of the patients, studies, series and images on the CT screen. Implementation restriction:
- The CT is not guaranteed able to display the directory listing of CD-ROM disks on which the data is pressed by the disk producer (like is the case with software CD's).

3.3.2.1.1   Application Profile(s) for this RWA

See Table 3-66.

3.3.2.1.2   Required and optionally DICOMDIR Keys

The Mandatory DICOMDIR Keys are required for the correct display of Directory information. The display is structured according the DICOM Composite Information Model: Patient, Study, Series, Image.

Possibly present optional DICOMDIR Keys are not displayed.

3.3.2.2 RWA Write images on CD-R disk

The CT AE will act as a FSC when writing all/selected images in a patient folder onto the CD-R medium.

Note that the images are written in ELE (by default), so are uncompressed, as specified in the STD-GEN-CD Application Profile. Other Presentation contexts are configurable.

3.3.2.2.1   Application Profile(s) for this RWA

See Table 3-66.

3.3.2.2.2   Support for Attributes in the images

The same remarks as in section 3.1.2.1 on page 14 about the existence of Optional, Retired and Private Attributes are applicable.

The DICOMDIR file will be extended when new images are written. In case some attributes are not present in the images but are specified Mandatory in the DICOMDIR definition in DICOM Media, a dummy ID will be filled in.

Implementation remarks and restriction:
- When writing the DICOMDIR records the key values are generated when no value of the corresponding attribute is supplied:
  -PATIENT_ID
  -STUDY_ID
  -STUDY_INSTANCE_UID
  -SERIES_NUMBER
  -SERIES_INSTANCE_UID
  -IMAGE_NUMBER
  -SOP_INSTANCE_UID
- The mechanism of generating a value for PATIENT_ID creates each time a new value based on PATIENT_NAME for each new study written to the CD-R, even if this study belongs to a patient recorded earlier.
- The default value for the Pixel Intensity Relationship (0028,1040) is set to DISP.
- A number of attributes (e.g., Window Width and Window Center) can be formatted as floating point numbers.

3.3.2.3 RWA Read images from CD-R disk

The CT AE will act as a FSR when reading all/selected images from the CD-R medium.

Implementation remarks and restriction:
• The CT is also able to read images coded in all of the JPEG codes as specified in Table 3-3, "Proposed Presentation Contexts for the CT to Other," on page 14.

3.3.2.3.1   Application Profile(s) for this RWA

See Table 3-66.

3.3.2.3.2   Support for Attributes in the images

The Mandatory Attributes of the DICOM images are required for the correct storage of the images in the CT internal image database. Optionally Attributes and Retired/Private Attributes are stored too if present; this is equivalent with the Level 2 (Full) conformance for the Storage Service Class in the Network support, see section 3.1.3.2 on page 40.

3.3.3 General Application Profile

The CT supports all transfer syntaxes as mentioned Table 3-3 on page 14.

4 Communication Profiles

This chapter applies for both AE.

4.1 Supported Communication Stacks

The CT application provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

4.2 TCP/IP Stack

The CT inherits its TCP/IP stack from the SUN Solaris system upon which it executes.

4.2.1 Physical Media Support

Ethernet ISO.8802-3. Standard AUI, optional twisted pair, 10/100-BaseT.

5 Extensions/Specializations/Privatizations

The Standard DICOM SOP Classes may be Extended with additional attributes:
- Standard attributes of other SOP Classes; the presence of these attributes in exported images can be configured, see section 6.2 on page 57
- Retired (from ACR NEMA 1.0 or 2.0) attributes; the presence of these attributes in exported images can be configured, see section 6.2 on page 57
- Private attributes; the presence of these attributes in exported images can be configured, see section 6.2 on page 57.

There are no Specialised SOP Classes.

The Table 3-1 on page 11 and Table 3-2 on page 12 list the supported Private SOP Classes. The usage of these SOP Classes are in the CT domain only. However instances of these Private SOP Classes may be exported towards a PACS environment and stored in a (central) DICOM archive and should be configured in order to make this possible. This is why the CT Private SOP Classes UIDs are mentioned in this Conformance Statements. The table below gives a short description of the Private SOP Classes.

Table 5-1: Short description of the Private SOP classes of the CT

SOP Class	Description
3D Volume Storage	This type of image can be generated in the CT in the volume facility.
3D Object Storage	This type of image can be generated in the CT in the volume facility.
Surface Storage	This type of image can be generated in the CT in the volume facility.
Composite Object Storage	This type of image can be generated in the CT in the volume facility.

6 Configuration

The CT system is configured by means of a configuration program. This program is accessible at start-up of the CT system. It is password protected and intended to be used by Philips Customer Support Engineers only. The program prompts the Customer Support Engineer to enter configuration information needed by the CT application.

6.1 AE Title/Presentation Address mapping

6.1.1 Local AE Title and Presentation Address

The Network and RIS AE have both different AE-Title's. These AE titles are configurable.

6.1.2 Remote AE Titles and Presentation Addresses

All relevant remote applications are able to setup a DICOM Association towards the CT must be configured at the CT configuration time. The Customer Support Engineer must provide the following information for each remote application:
- The Application Entity title.
- The SOP classes and Transfer Syntaxes for which the CT accepts Associations.

All relevant remote applications are able to accept DICOM Associations from the CT, the following information must be provided:
- The Application Entity title.
- The IP node name /IP address on which the remote application resides.
- The port number at which the remote application accepts Association requests.

6.2 Configurable parameters.

6.2.1 Configuration per CT system.

The following items are configurable **per CT Network AE Title**:
- The SOP classes (out of the full list of SOP Classes in Table 3-1 on page 11 and Table 3-2 on page 12) and Transfer Syntaxes (out of the full list in Presentation Context tables in this Statement (Table 3-3 and Table 3-30 to Table 3-33)) to be used.
- The maximum PDU size for associations initiated by the CT (default is 0 meaning unlimited PDU size)

The following items are configurable **per CT RIS AE Title**:
- The SOP classes (out of the full list of SOP Classes in Table 3-49 on page 43) and Transfer Syntaxes (out of the full list in Presentation Context tables in this Statement (Table 3-45 to Table 3-48 and Table 3-50)) to be used.
- The maximum PDU size for associations initiated by the CT (default is 0 meaning unlimited PDU size)

6.2.2 Configuration per remote system

The following items are configurable **per remote system**:
- The SOP classes and Transfer Syntaxes for which the CT sets-up and accepts Associations.
- Automatic conversion of images of SOP classes not supported by remote systems into SC

Image Storage SOP instances,
- The maximum PDU size for Associations initiated by the CT,
- Export of 'pure' DICOM images (i.e. only the standard DICOM attributes defined in the related IOD) or 'rich' DICOM images (with additional Standard DICOM, Private and Retired Attributes)

6.2.3 Print Configuration

Configurable per CT installation:
- The DICOM printers to be selected by the operator.

The following print parameters are configured per DICOM printer type (see also the Print Management overview of the supported attributes in section 3.1.2.5.3 on page 32):
- The Medium Type
- Film Size ID (i.e. Media Size)
- Film Orientation
- Image Display Format
- Film Size in X an Y direction (this influences the Rows and Columns in the Image Box instances)
- Configuration Information (configurable per print destination)
  This is a character string containing implementation specific print parameters.
- Magnification Type.
- Trim.
- Film Destination.
- Max. Density.

These print parameters can be selected from choice lists. These choice lists are defined via so-called prototypes for each type of printer and print medium. These prototype are also configurable.

7 Support of Extended Character Sets

The CT supports Extended Character Set "ISO_IR 100" which is the Latin alphabet No 1, supplementary set.

8 Remarks

- The input of Image Data from legacy systems (e.g., SR 4/5/6/7000), using 5 1/4" MOD may result in an unclear patient date of birth. The reason is that this data has been stored with a two digit year date, and patients of 100 years or older will have a year of birth of '00, '01, etc., instead of 1900, 1901, etc.
  Image Data stored with four digit year dates will be problem free.