# Philips Medical Systems
# DICOM Conformance Statement

# CT Secura Release 1.3

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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]. The conformance to the DICOM standard is a key element of the Philips Inturis Program (see [INTURIS]).

## 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

[INTURIS] Inturis for Radiology
Doc. nr. 4522 982 63281
Philips Medical Systems Ned. BV

## 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 Secura Release 1.3 system (from now on mentioned as CT) of Philips Medical Systems is a scanner 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 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 a CD.
- Modality Worklist Management (WLM).
- Modality Performed Procedure Step (MPPS).
- Query/Retrieve.
- Storage Commitment Push/Pull Model

See for more details the release bulletin.

## 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 5.

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 Entity acts as a Service Class User (SCU) and Service Class Provider (SCP):
- SCU for CT, SC, MR, MPPS, Q/R, WLM and Storage Commit
- SCP for CT, SC, MR, Q/R

The CT-Print Application Entity acts as Service Class User (SCU) for the Print Service Class.

The CT acts also 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**

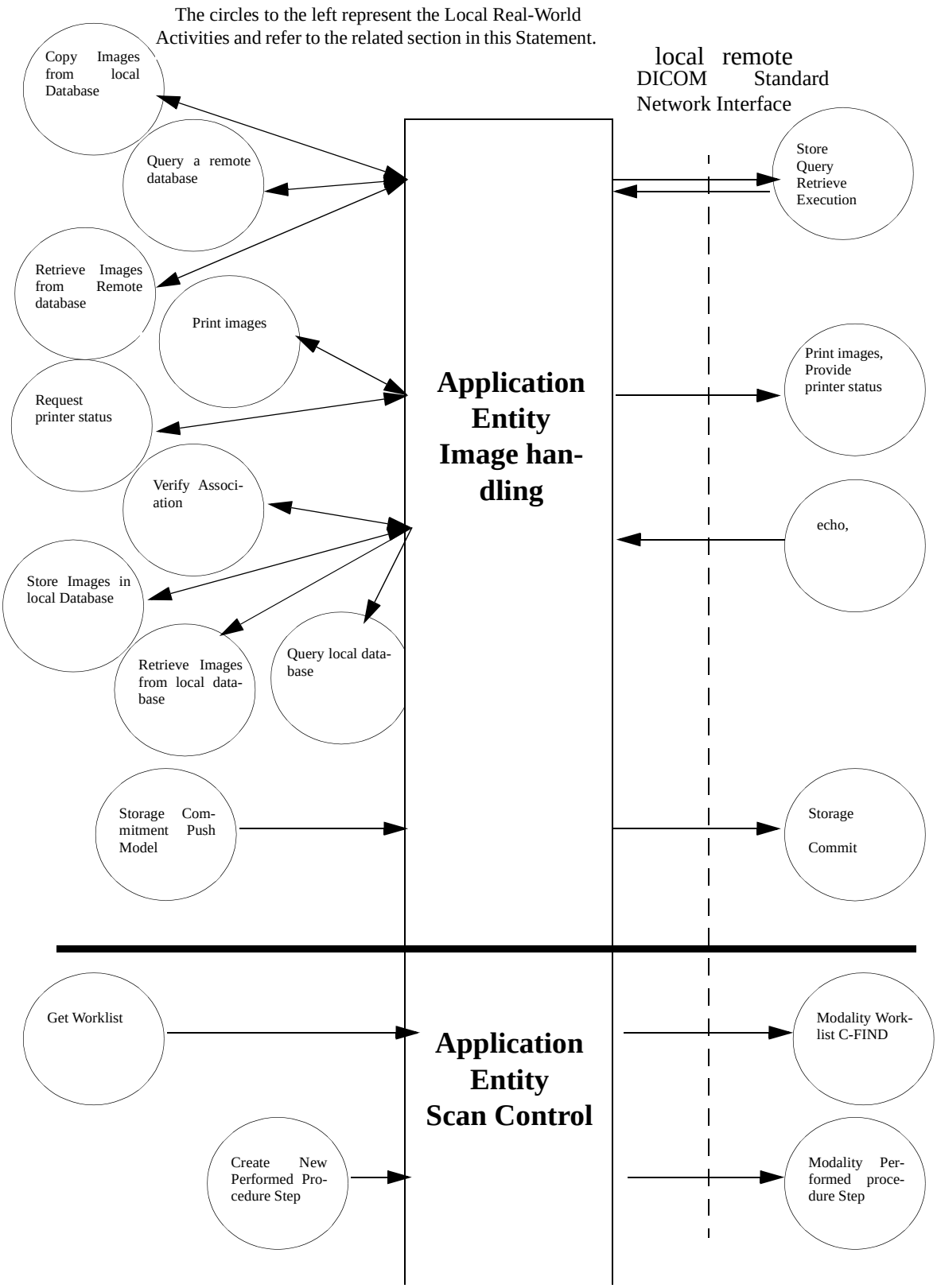
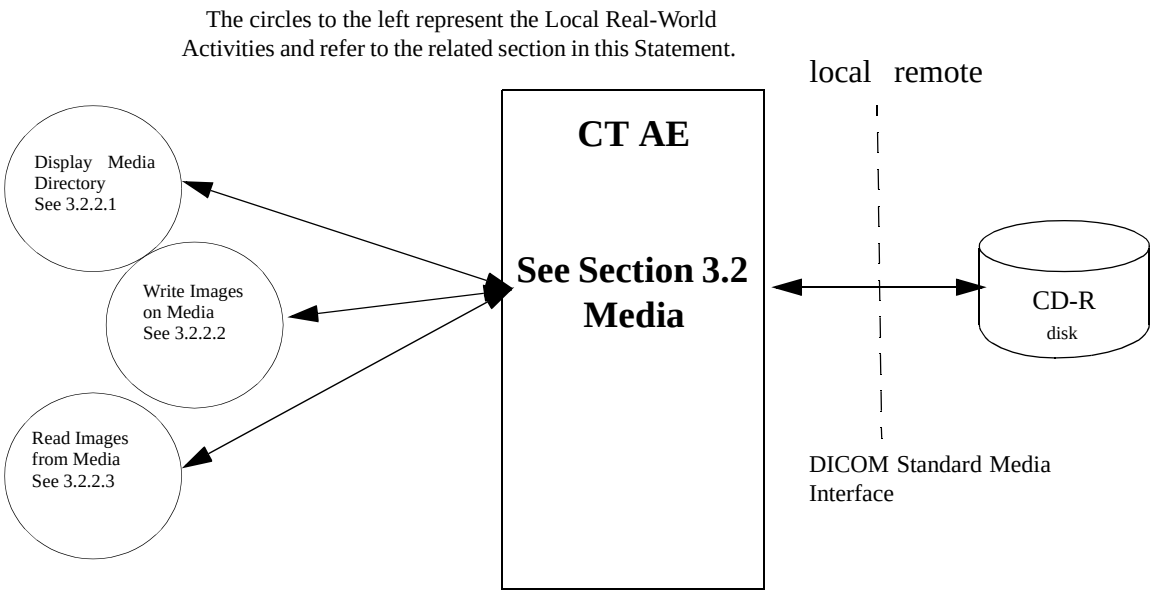


**Figure 2-2: CT Implementation Model/Media**



# 3 AE Specifications

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

## 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:

- 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 48.

**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 |
| MR Image Storage | 1.2.840.10008.5.1.4.1.1.4 |
| 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 |
| 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 |
| 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 |

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

| SOP class Name | UID |
|---|---|
| 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 |
| 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 |

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 48.

**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 |
| 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 |
| 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 |

### 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:

- WLM
- MPPS
- 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: 1.3.46.670589.10.20.800143.3
The implementation version name is: CT backend 1.3L1

### 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 10;
- The CT operator requests to print selected images in the CT database, see section 3.1.2.7 on page 34.
- The CT operator requests for the status of a selected printer, see section 3.1.2.8 on page 39.
- Query Remote Database
- Query WLM
- Start Exam (MPPS)
- Finish Exam (MPPS)

### 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.

The CT is able to send the CT Image IOD and the SC Image IOD to a remote location.

#### 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<br>ELE<br>EBE<br>JPEG Baseline<br>JPEG Extended<br>JPEG Lossless, Non-Hierarchical<br>JPEG Lossless, Hierarchical, First Order Prediction | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.57<br>1.2.840.10008.1.2.4.70 | SCU<br>SCU<br>SCU<br>SCU<br>SCU<br>SCU<br>SCU | None<br>None<br>None<br>None<br>None<br>None<br>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 7.
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 transfer (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.

#### 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.

**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 |
| 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 |
| 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.<br>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. |

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

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| 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. |
| > 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.<br>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.<br>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. |

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

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Request Attributes Sequence | 0040,0275 | |
| > Scheduled Procedure Step Description | 0040,0007 | |
| > Scheduled Action Item Code Sequence | 0040,0008 | |
| > Scheduled Procedure Step ID | 0040,0008 | |
| > Requested Procedure ID | 0040,1001 | |
| Performed Procedure Step Date | 0040,0244 | Obtained from RIS. |
| Performed Procedure Step Time | 0040,0245 | Obtained from RIS. |
| Performed Procedure Step ID | 0040,0253 | Obtained from RIS. |

**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.<br>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.<br>Applied value(s): Philips CT Secura |
| Software Version(s) | 0018,1020 | Manufacturer's designation of software version of the equipment that produced the digital images.<br>Applied value(s): CT backend release 1.3 level 1 |

**Table 3-10: CT Image Storage SOP Class - General Equipment Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| 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 | |

**Table 3-12: CT Image Storage SOP Class - Image Plane Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| 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.<br>Applied value(s): 1 |
| Photometric Interpretation | 0028,0004 | Specifies the intended interpretation of the pixel data.<br>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.<br>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.<br>Applied value(s): 12 |
| High Bit | 0028,0102 | Most significant bit for pixel sample data. Each sample shall have the same high bit.<br>Applied value(s): 11 |
| Pixel Representation | 0028,0103 | Data representation of the pixel samples. Each sample shall have the same pixel representation.<br>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.<br>Applied value(s): ORIGINAL \ PRIMARY \ AXIAL, LOCALIZER\VOLUME, SERIAL, DYNAMIC, SCANOGRAM |
| 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 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).<br>HU = m*SV+b.<br>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.<br>Applied value(s): ISO_IR 100 |
| SOP Class UID | 0008,0016 | Uniquely identifies the SOP Class.<br>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 | - | - |

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

| Information Entity | Module | Conditional Attributes | Optional Attributes |
|---|---|---|---|
| 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. |

**Table 3-20: Secondary Capture Image Storage SOP Class - Patient Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| 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 | |
| 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. |

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

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| > 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 | |
| > Scheduled Action Item Code Sequence | 0040,0008 | |
| > Requested Procedure ID | 0040,1001 | |
| Performed Procedure Step Date | 0040,0244 | Obtained from RIS. |
| Performed Procedure Step Time | 0040,0245 | Obtained from RIS. |
| Performed Procedure Step ID | 0040,0253 | Obtained from RIS. |

**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.<br>Applied Value(s): Philips CT Secura |
| Software Version(s) | 0018,1020 | Manufacturer’s designation of software version of the equipment that produced the digital images.<br>Applied value(s): CT Backend Release 1.3 Level 1 |
| 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.<br>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. |
| 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.<br>Applied value(s): 0000 |

**Table 3-26: Secondary Capture Image Storage SOP Class - Image Pixel Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| 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.<br>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: See Table 3-1, "Supported SOP classes by the CT AE as SCU," on page 7 for related SOP Class.*

#### 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 Table 3-30, “Proposed Presentation Contexts,” on page 24

#### 3.1.2.3.3 C-MOVE SCU Conformance

The AE provides standard conformance.

### 3.1.2.4 Request to send MPPS

#### 3.1.2.4.1 Associated Real-World Activity

MPPS and WLM are done in parallel.

#### 3.1.2.4.2 Proposed Presentation Contexts

The CT will propose the presentation contexts as given in Table 3-30, “Proposed Presentation Contexts,” on page 24

#### 3.1.2.4.3 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.

Table 3-31 lists the applied Conditional (DICOM Type 1C and 2C) and Optional (DICOM Type 3) attributes in the Modality Performed Procedure Step IOD N-CREATE, MPPS.

**Table 3-31: Applied Conditional and Optional Attributes of the Modality Performed Procedure Step IOD N-CREATE**

| Module | Conditional Attributes | Optional Attributes |
|---|---|---|
| SOP Common | Specific Character Set. | - |
| Image Acquisition Results | - | Code Meaning |
| Performed Procedure Step Information | - | Code Meaning |
| Performed Procedure Step Relationship | - | Code Meaning |

Table 3-32 lists the applied Conditional (DICOM Type 1C and 2C) and Optional (DICOM Type 3) attributes in the Modality Performed Procedure Step IOD, MPPS N-SET

**Table 3-32: Applied Conditional and Optional Attributes of the Modality Performed Procedure Step IOD N-SET**

| Module | Conditional Attributes | Optional Attributes |
|---|---|---|
| SOP Common | Specific Character Set | - |
| Performed Procedure Step Information | - | - |

#### 3.1.2.4.3.1 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 3-33: Modality Performed Procedure Step IOD N-CREATE**

| Module | Reference |
|---|---|
| Image Acquisition Result | Table 3-34 |
| Performed Procedure Step Information | Table 3-35 |

**Table 3-33: Modality Performed Procedure Step IOD N-CREATE**

| Module | Reference |
|---|---|
| Performed Procedure Step Relationship | Table 3-36 |

**Table 3-34: 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.<br>Applied value(s): CT |
| Study ID | 0020,0010 | User or equipment generated Study Identifier.<br>Equals: Empty. |
| Performed Action Item Sequence | 0040,0260 | Sequence describing the Action Items performed for this Procedure Step. Always zero length. |
| > Code Value | 0008,0100 | |
| > Coding Scheme Designator | 0008,0102 | |
| > Code Meaning | 0008,0104 | |

**Table 3-35: 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. |
| 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.<br>Equals: Empty |
| Performed Procedure Step Start Time | 0040,0245 | Time on which the Performed Procedure Step started.<br>Equals: Empty. |
| Performed Procedure Step End Date | 0040,0250 | Always Empty. |
| Performed Procedure Step End Time | 0040,0251 | Always Empty. |

**Table 3-35: Modality Performed Procedure Step SOP Class - Performed Procedure Step Information Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| 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 3-36: 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.<br>Applied value(s): F, M, O |
| Referenced Patient Sequence | 0008,1120 | Uniquely identifies the Patient SOP Instance. Zero length. |
| > Referenced SOP Class UID | 0008,1150 | |
| > Referenced SOP Instance UID | 0008,1155 | |
| 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. |
| >> Referenced SOP Class UID | 0008,1150 | Uniquely identifies the referenced SOP Class.<br>Applied Value(s):<br>1.2.840.10008.3.1.3.1 |
| >> Referenced SOP Instance UID | 0008,1155 | Uniquely identifies the referenced SOP Instance. |
| > Study Instance UID | 0020,000D | Unique identifier for the Study. |

**Table 3-36: Modality Performed Procedure Step SOP Class - Performed Procedure Step Relationship Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| > 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. Zero length |
| >> 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. |

### 3.1.2.4.3.2 MPPS IOD attribute Overview, N-SET

**Table 3-37: Modality Performed Procedure Step IOD N-SET**

| Module | Reference |
|---|---|
| Image Acquisition Result Module | Table 3-39 |
| Performed Procedure Step Information | Table 3-39 |

**Table 3-38: 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. Always zero length. |
| > Performing Physician’s Name | 0008,1050 | Name of the physician administering this Series. Equals: Empty. |

**Table 3-38: Modality Performed Procedure Step SOP Class - Image Acquisition Result Module (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| > 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. |

**Table 3-39: 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 |

### 3.1.2.5 Request to receive WLM data

#### 3.1.2.5.1 Associated Real-World Activity

MPPS and WLM are done in parallel.

#### 3.1.2.5.2 Proposed Presentation Contexts

The CT will propose the presentation contexts as given in Table 3-30, “Proposed Presentation Contexts,” on page 24

#### 3.1.2.5.3 Modality Worklist Query/Retrieve Conformance

**Table 3-40: Modality Worklist Query/Retrieve Information Model**

| Module | Reference |
|---|---|
| Patient Identification | Table 3-41 |
| Patient Demographic | Table 3-42 |
| Visit Relationship | Table 3-43 |
| Scheduled Procedure Step | Table 3-44 |
| Requested Procedure | Table 3-45 |
| Imaging Service Request | Table 3-46 |

**Table 3-41: Modality Worklist Information Model - FIND SOP Class - Patient Identification Module**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Patient’s Name | 0010,0010 | Always zero length, so match all for the query response. |
| Patient ID | 0010,0020 | Always zero length, so match all for the query response. |

**Table 3-42: Modality Worklist Information Model - FIND SOP Class - Patient Demographic Module**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Patient’s Birth Date | 0010,0030 | Always zero length, so match all for the query response. |
| Patient’s Sex | 0010,0040 | Always zero length, so match all for the query response. |

**Table 3-43: Modality Worklist Information Model - FIND SOP Class - Visit Relationship Module**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Referenced Patient Sequence | 0008,1120 | Always zero length, so match all for the query response. |

**Table 3-44: 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 time 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 Action Item Code Sequence | 0040,0008 | Always zero length, so match all for the query response. |
| > Scheduled Procedure Step ID | 0040,0009 | Always zero length, so match all for the query response. |
| > Pre-Medication | 0040,0012 | Always zero length, so match all for the query response. |
| Medical Alerts | 0010,2000 | |
| Contrast Allergies | 0010,2110 | |
| Pregnancy Status | 0010,2100 | |
| Special Needs | 0038,0050 | |

**Table 3-45: Modality Worklist Information Model - FIND SOP Class - Requested Procedure Module**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Referenced Study Sequence | 0008,1110 | Always zero length, so match all for the query response. |
| Study Instance UID | 0020,000D | Always zero length, so match all for the query response. |
| Requested Procedure Description | 0032,1060 | Always zero length, so match all for the query response. |
| Requested Procedure ID | 0040,1001 | Always zero length, so match all for the query response. |

**Table 3-46: Modality Worklist Information Model - FIND SOP Class - Imaging Service Request Module**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Accession Number | 0008,0050 | Always zero length, so match all for the query response. |
| Referring Physician's Name | 0008,0090 | Always zero length, so match all for the query response. |

#### 3.1.2.6 Storage Commitment

##### 3.1.2.6.1 Associated Real-World Activity

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

##### 3.1.2.6.2 Presentation Context Table

See Table 3-30, “Proposed Presentation Contexts,” on page 24.

##### 3.1.2.6.3 Storage Commitment Push SCU Conformance

The CT provides standard conformance.

### 3.1.2.7 Print images

#### 3.1.2.7.1 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.

#### 3.1.2.7.2 Proposed Presentation Contexts

The CT will propose the presentation contexts as given in: Table 3-30 on page 24.

#### 3.1.2.7.3 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 3-47. 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 3.1.2.7.3 on page 34.

**Table 3-47: 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.<br>Applied optional attributes are:<br>Number of Copies, Print Priority, Medium Type, Film Destination |

**Table 3-47: The applied order of Print Service Elements and its optional attributes**

| Service Element of SOP Class | Description and applied optional attributes |
|---|---|
| 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.<br>Applied optional attributes are:<br>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.<br>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.<br>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 3-48: 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 3.1.2.8. |

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 3.1.2.7.3 on page 34. 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.

#### 3.1.2.7.3.1 Basic Film Session SOP Class

**Table 3-49: 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 |

#### 3.1.2.7.3.2 Basic Film Box SOP Class

**Table 3-50: 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.<br>Applied value(s): CUSTOM\1,<br>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.<br>Applied value(s): NONE |
| Trim | 2010,0140 | |

**Table 3-50: Basic Film Box SOP Class - N-CREATE (Continued)**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Configuration Information | 2010,0150 | Contains a vendor specific Lookup-table (LUT); should be applied by the DICOM printer if LUT data is present. |

**Table 3-51: 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 3-52: Basic Film Box SOP Class - N-ACTION**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| No attributes present | | |

### 3.1.2.7.3.3 Basic Grayscale Image Box SOP Class

**Table 3-53: 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 | |

### 3.1.2.7.3.4 Color Grayscale Image Box SOP Class

**Table 3-54: 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<br>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 |
| > 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 3-56, “Printer SOP Class - N-GET,” on page 39.

### 3.1.2.8 Request for the Printer Status

#### 3.1.2.8.1 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.

#### 3.1.2.8.2 Proposed Presentation Contexts

The CT will propose the presentation contexts as given in: Table 3-30, “Proposed Presentation Contexts,” on page 24.

#### 3.1.2.8.3 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 3-55. The **detailed list of (Mandatory and Optional) attributes** applied in this Service Element is given in section 3.1.2.7.3 on page 34.

**Table 3-55: 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.<br>Applied optional attributes are:<br>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 3-56: Printer SOP Class - N-GET**

| *Attribute Name* | *Tag* | *Note* |
|---|---|---|
| Printer Status | 2110,0010 | |
| Printer Status Info | 2110,0020 | |

**Table 3-57: 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 40;
- To allow remote applications to store CT, SC and MR images in the CT database (i.e. image import), see section 3.1.3.2 on page 41;

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.

See Table 3-30, “Proposed Presentation Contexts,” on page 24.

##### 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

See Table 3-30, “Proposed Presentation Contexts,” on page 24.

#### 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.

#### 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

Any of the presentation contexts shown in Table 3-30, “Proposed Presentation Contexts,” on page 24 are acceptable.

##### 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

Any of the presentation contexts shown in Table 3-30 on page 24 are acceptable.

#### 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.

## 3.2 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 3-58.

**Table 3-58: 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 7 (for Write) and Table 3-2 on page 8 (for Read) via this Application Profile.

### 3.2.1 File Meta Information

The (Source) Application Entity Title is specified in section 3.1.1.4 on page 9.
The Implementation Class UID and the Implementation Version Name in the File Meta Header is specified in section 3.1.1.4 on page 9.

### 3.2.2 Media related Real-World Activities

#### 3.2.2.1 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).

##### 3.2.2.1.1 Application Profile(s) for this RWA

See Table 3-58.

##### 3.2.2.1.2 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.

#### 3.2.2.2 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.

##### 3.2.2.2.1 Application Profile(s) for this RWA

See Table 3-58.

##### 3.2.2.2.2 Support for Attributes in the images

The same remarks as in section 3.1.2.1 on page 10 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.

#### 3.2.2.3 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 10.

##### 3.2.2.3.1 Application Profile(s) for this RWA

See Table 3-58.

##### 3.2.2.3.2 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 41.

### 3.2.3 General Application Profile

The CT supports all transfer syntaxes as mentioned Table 3-3 on page 10.

# 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 49
- 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 49
- Private attributes; the presence of these attributes in exported images can be configured, see section 6.2 on page 49.

There are no Specialised SOP Classes.

The Table 3-1 on page 7 and Table 3-2 on page 8 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 CT AE title is default equal to the IP host name. This host name can be changed by the Customer Support Engineer at installation.

The CT listens on port **3010**. This port number is **not** configurable.

### 6.1.2 Remote AE Titles and Presentation Addresses

All relevant remote applications 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 able to accept DICOM Associations from the CT, the following information must be provided:
- The Application Entity title.
- The host 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 installation**:
- The SOP classes (out of the full list of SOP Classes in Table 3-1 on page 7 and Table 3-2 on page 8) and Transfer Syntaxes (out of the full list in Presentation Context tables in this Statement) 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 3.1.2.7.3 on page 34):
- 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.