

## COHERENCE RT Archive SIENET SKY VA50A

**HS**

### DICOM Conformance Statement

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# Part I

# 1 Introduction

## 1.1 Purpose

This DICOM Conformance Statement is written according to part PS 3.2 of [1].

This DICOM Conformance Statement describes the DICOM Interface of the SIEMENS implementation of a Medical Imaging Viewing Station (SIENET SKY) running Software Version VA50x.

## 1.2 Definitions, Acronyms and Abbreviations

|      |                                                              |
|------|--------------------------------------------------------------|
| ACR  | American College of Radiology                                |
| AE   | DICOM Application Entity                                     |
| DBP  | DICOM Basic Print User                                       |
| DQRY | DICOM Query                                                  |
| DQUS | DICOM Query User                                             |
| FSC  | File Set Creator                                             |
| FSR  | File Set Reader                                              |
| FSU  | File Set Updater                                             |
| IOD  | DICOM Information Object Definition                          |
| NEMA | National Electrical Manufacturers Association                |
| NI   | Network Interface of the SIENET SKY                          |
| PDU  | Protocol Data Unit                                           |
| SC   | Storage Commitment                                           |
| SCU  | DICOM Service Class User (client using this DICOM service)   |
| SCP  | DICOM Service Class Provider (server providing this service) |
| SOP  | Service/Object Pair                                          |
| UID  | Unique Identifier, string unique in the whole network        |

## 1.3 References

- [1] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-15

## 2 Implementation Model

Siemens SKY DICOM Interface is implemented to support DICOM Application Entities (AE) as SCP which receive associations from remote Application Entities.

Siemens SKY DICOM Interface originates associations for Storage of DICOM Composite Information Objects in Remote Application Entities.

Siemens SKY DICOM Interface is implemented to act as SCU/SCP for the Storage Commitment Push Model Service using the Storage Commitment Service Class.

Siemens SKY DICOM Interface originates associations for Query and Retrieve of DICOM Composite Information Objects stored in Remote Application Entities.

Siemens SKY DICOM Interface originates associations for Query of Worklists stored in remote Application Entities.

Siemens SKY DICOM Interface originates associations for Print using Normalized classes. These Normalized Service Classes can work on objects and can create, delete, update or take action upon these objects.

### 2.1 Application Data Flow Diagram

The Network Interface (NI) handles the DICOM communication for SIENET SKY.

This Interface starts automatically and will be invoked automatically via the integrated SIENET SKY user-interface.

- o A remote Application Entity (AE) initiates an association for the DICOM Storage Service Class to the AE of NI. Upon acceptance of the association by NI the remote AE transmits the DICOM Information Objects to the NI receiver. After an object is received, NI initiates the transfer of the DICOM objects to the SKY image database.
- o A remote AE initiates an association for the DICOM Query/Retrieve Service Class to the AE of NI. Upon acceptance of the association by NI the remote AE transmits DICOM Query/Retrieve Requests to the NI query provider.
  - In case of a C-Find Request the NI query provider queries the database of SKY and generates a response for each match. The responses are sent back to the remote AE via DICOM query responses.
  - In case of a C-Move Request the NI query Provider queries the database of SKY and initiates a Storage request for each match. A final Retrieve Response is sent back to the remote AE.\*
- o NI initiates associations for DICOM Storage Service Class to remote AEs. For each remote DICOM node a new association to the corresponding remote DICOM AE is initiated. The DICOM objects are sent by NI sender via that open association.
- o For request for storage commitment, the NI acting as SC SCU initiates association with remote AE (SC SCP), then sends N-Action request message and closes the association after receiving the N-Action response from the SC SCP. The NI waits then for and accept the incoming association from the SC SCP. The SC SCU has to receive the N\_Event\_Report request message from the SC SCP and then has to send a N\_Event\_Report response back to the SC SCP after which the SC SCP closes the association.

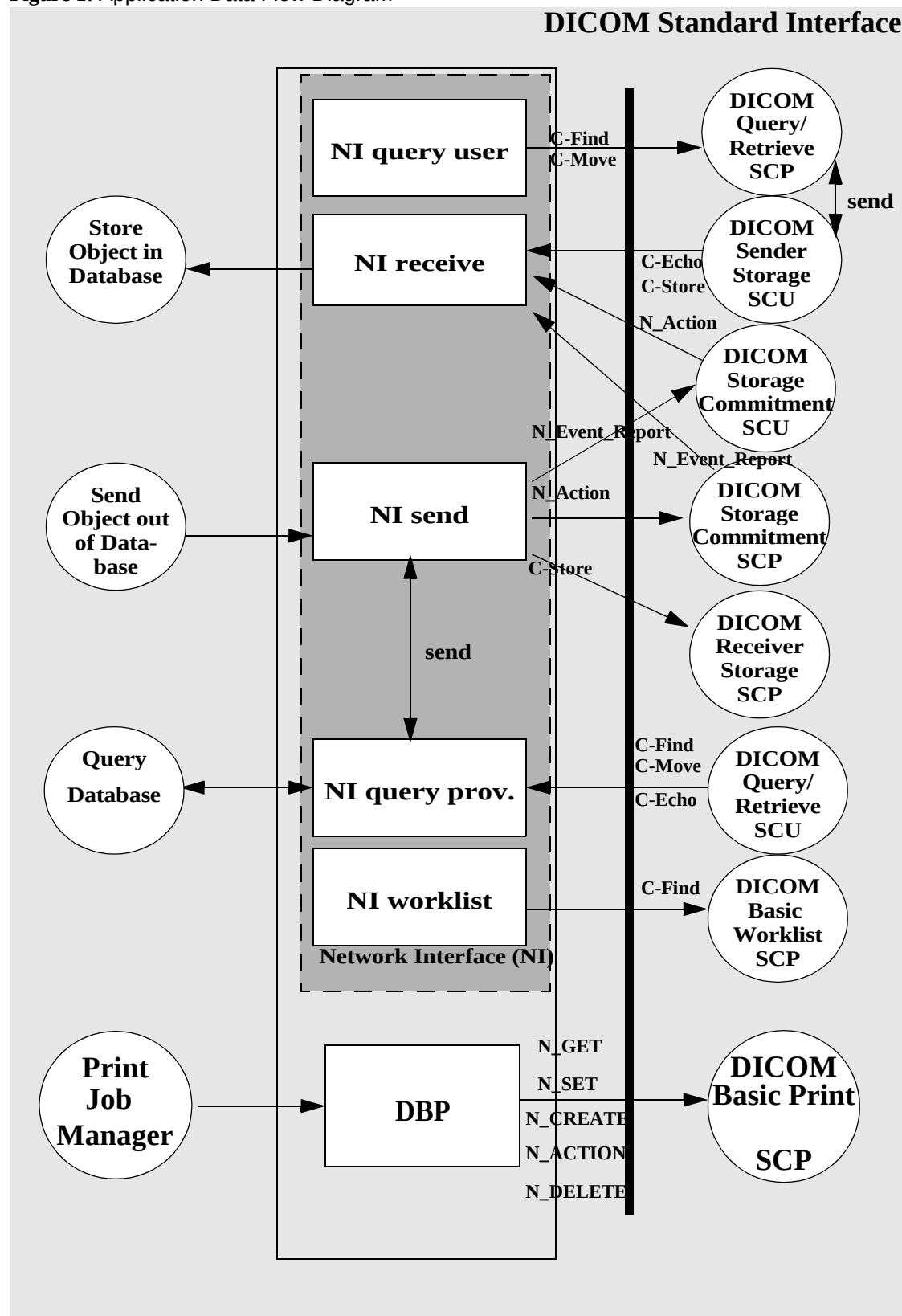
- o To provide storage commitment, the NI acting as SC SCP waits for new association to be opened by a remote AE acting as SC SCU. On receipt of a N-Action request message the NI sends a N-Action response message back to the SC SCU. After processing the commitment request (see note below), the NI notifies the commitment to the SC SCU by opening an association and sending a N\_Event\_Report request message to the SC SCU. Upon receiving the N\_Event\_Report response message from the SC SCU, the NI closes the association.

**Note:** The storage commitment is provided only for those data, which are stored at the long-term archive (DVD or CD-R Jukebox). The N\_Event\_Report request message notifying the commitment is sent after successful burning to CD-R/DVD.

- o NI initiates associations for DICOM Query / Retrieve Service Class to remote AEs.
- o NI initiates associations for DICOM Basic Worklist Service Class to remote AEs.\*
- o DBP initiates association for Siemens SKY DICOM Basic Print to remote AEs.\*
- o CD Module reads DICOM Media Storage (FSR) and loads SOP Instance files into viewer (STD-GEN-CD Profile)  
CD Module writes DICOM Media Storage (FSC) in a most recent write session.\*

\* Query SCP, Worklist SCU, Print SCU and Media Storage are available only with some Licensed Applications.

Figure 1: Application Data Flow Diagram



## **2.2 Functional Definitions of Application Entities**

The components NI send, NI receive and NI query provider are running in PcvNetService which starts automatically on OS startup. The NI query user are foreground operations which are invoked by the user.

NI receive acting as a SCP is waiting for association requests from a remote DICOM client. The Application Entity Title the SCP is listening on is taken from the local configuration. The Port Number is 104.

NI query provider acting as a SCP is waiting for association requests from a remote DICOM client. The Application Entity Title the SCP is listening on is taken from the local configuration. The Port Number is 104.

NI send acting as a SCU is waiting for requests from the Application. When a request is received, NI send initiates an association with a remote Application Entity.

NI query user acting as a SCU is waiting for requests from the User. When a request is started, NI query user initiates an association with a remote Application Entity.

NI worklist acting as a SCU is waiting for requests from the application. When a request is received, NI worklist initiates an association with a remote Application Entity.

DBP acting as a SCU waits for print requests from the workstation's user. DBP initiates an association with a remote Application Entity and sends DICOM Basic Print Requests.

## **2.3 Sequencing of Real World Activities**

not applicable.

## 3 Application Entity Specifications

### 3.1 AE Specification

SKY Network Interface provides one Application Entity.

The Siemens SKY provides Standard Conformance to the following DICOM Storage SOP Classes as an SCU and SCP:

#### Storage SOP Classes as an SCU and SCP

- o CR (Computed Radiography) Image Storage
- o CT Image Storage
- o Ultrasound Image Storage Retired
- o Ultrasound Image Storage
- o Ultrasound Multiframe Image Storage
- o Ultrasound Multiframe Image Storage retired
- o MR Image Storage
- o SC Image Storage
- o X-Ray Angiographic Image Storage
- o X-Ray Radiofluoroscopic Image Storage
- o Nuclear Medicine Image Storage
- o Positron Emission Tomography Image Storage
- o Radio Therapy Image Storage
- o Radio Therapy Dose Storage
- o Radio Therapy Plan Storage
- o Radio Therapy Structure Set Storage
- o Radio Therapy Beams Treatment Record Storage
- o Radio Therapy Brachy Treatment Record Storage
- o Radio Therapy Treatment Summary Record Storage
- o Digital X-Ray Image Storage - For Presentation
- o Digital X-Ray Image Storage - For Processing
- o Digital Mammography X-Ray Image Storage - For Presentation
- o Digital Mammography X-Ray Image Storage - For Processing
- o Digital Intra-Oral X-Ray Image Storage - For Presentation
- o Digital Intra-Oral X-Ray Image Storage - For Processing
- o Hardcopy Color Image Storage
- o Hardcopy Grayscale Image Storage

- o VL Endoscopic Image Storage
- o VL Microscopic Image Storage
- o VL Photographic Image Storage
- o VL Slide-Coordinates Microscopic Image Storage
- o Basic Text SR
- o Enhanced SR
- o Comprehensive SR
- o Mammography CAD SR
- o Key Object Selection
- o Grayscale Softcopy Presentation Storage

The Siemens SKY provides Standard Conformance to the following DICOM Storage Commitment SOP Classes as an SCU and SCP:

### Storage Commitment SOP Classes as SCU and SCP

- o Storage Commitment Push Model

The Siemens SKY provides Standard Conformance to the following DICOM Query/Retrieve SOP Classes as an SCU and SCP:

### Query/Retrieve SOP Classes as SCU and SCP

- o Patient Root Query/Retrieve Information Model - FIND
- o Patient Root Query/Retrieve Information Model - MOVE
- o Patient Study Only Query/Retrieve Information Model - FIND
- o Patient Study Only Query/Retrieve Information Model - MOVE
- o Study Root Query/Retrieve Information Model - FIND
- o Study Root Query/Retrieve Information Model - MOVE

The Siemens SKY provides Standard Conformance to the following DICOM Modality Worklist SOP Class as an SCU:

### Modality Worklist SOP Class as SCU

- o Modality Worklist Information Model - FIND

## Print Management SOP Class as SCU

- o Basic Grayscale Print Management
- o Basic Color Print Management

## Media Storage Service Class as FSR, FSC and FSU

- o General Purpose CD-R and DVD Interchange Profiles with Basic Directory and Composite Image & Standalone Storage
  - or configurable:
- o Ultrasound Application Profile for Image Display with Single or Multiframe images with Basic Directory and Composite Image & Standalone Storage

## 3.1.1 Association Establishment Policies

### 3.1.1.1 General

The configuration of the Siemens SKY defines the Application Entity Title, the port numbers and the host name and net address.

### 3.1.1.2 Number of Associations

NI send initiates only one association at a time.

NI receive accepts multiple associations from different remote DICOM AEs at a time. There may be several concurrent associations active and processed in parallel. The maximum of open associations are 10.

NI query user initiates up to 25 associations at a time for C-Find and may initiate up to 10 associations at a time for C-Move.

NI query Provider accepts multiple associations from different remote DICOM AEs at a time. There may be several concurrent associations active and processed in parallel. The maximum of open associations are 10.

NI worklist initiates only one association at a time.

DBP initiates one association at a time for DICOM Basic Print. Each Print job in the queue opens a fresh association and the association is closed after the job is done.

### 3.1.1.3 Asynchronous Nature

This version of the software does not support asynchronous communication (multiple outstanding transactions over a single association).

### **3.1.1.4 Implementation Identifying Information**

The Siemens SKY provides an Implementation Class UID of

- o "1.3.12.2.1107.5.8.2"

and an Implementation Version Name of

- o "SHS\_MV300\_VA42A".

## **3.1.2 Association Initiation Policy**

The Siemens SKY attempts to initiate a new association for

- o DIMSE-C-STORE
- o DIMSE-C-FIND
- o DIMSE-C-MOVE
- o DIMSE-N-ACTION
- o DIMSE-N-EVENT-REPORT
- o DIMSE-N-CREATE
- o DIMSE-N-GET
- o DIMSE-N-SET

service operations.

3.1.2.1 Real-World Activity - Verification SCU (C-ECHO request)

3.1.2.1.1 Associated Real-World Activity

The associated Real-World activity is a C-ECHO request. This function is contained in a SKY Service utility, which is part of the Software delivered with MagigView 300. If the process successfully establishes an association to a remote Application Entity, it will send the C-ECHO-Request via the open association to verify that the remote Application Entity is responding to DICOM messages.

3.1.2.1.2 Proposed Presentation Contexts

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

Table 1: Verification SCU Presentation Contexts of SKY

| Presentation Context Table |                   |                           |                     |      |                      |
|----------------------------|-------------------|---------------------------|---------------------|------|----------------------|
| Abstract Syntax            |                   | Transfer Syntax           |                     | Role | Extended Negotiation |
| Name                       | UID               | Name List                 | UID List            |      |                      |
| Verification               | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2   | SCU  | None                 |
|                            |                   | Explicit VR Big Endian    | 1.2.840.10008.1.2.2 |      |                      |
|                            |                   | Explicit VR Little Endian | 1.2.840.10008.1.2.1 |      |                      |

3.1.2.1.3 SOP Specific Conformance Statement - Verification SCU

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

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### 3.1.2.2 Real-World Activity - Send Image Objects to a Remote Node

#### 3.1.2.2.1 Associated Real-World Activity - Send Image Objects to a Remote Node

The associated Real-World activity is a C-Store request initiated by the user of the Viewing station. If NI send successfully establishes an association to a remote Application Entity, it transfers each image of the study or series one after another via the open association. If the C-Store Response from the remote Application contains a status other than Success, the association is aborted. After a configurable time period, the transfer of the folder is started again. If the Retry fails several times, the foldername will be logged on a history queue with status Failed.

The DICOM targets are configured at configuration time.

#### 3.1.2.2.2 Proposed Presentation Contexts

The Siemens MagicView will propose Presentation Contexts as shown in the following tables.

**Table 2:** STORE SCU Presentation Contexts of SKY

| Presentation Context Table |                           |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                               |      |                      |
|----------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------|
| Abstract Syntax            |                           | Transfer Syntax                                                                                                                                                                                                                                                                                                         |                                                                                                                                               | Role | Extended Negotiation |
| Name                       | UID                       | Name List                                                                                                                                                                                                                                                                                                               | UID List                                                                                                                                      |      |                      |
| CR Image Storage           | 1.2.840.10008.5.1.4.1.1.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>a</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>b</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>c</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU  | None                 |
| CT Image Storage           | 1.2.840.10008.5.1.4.1.1.2 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup>                                                 | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                           | SCU  | None                 |

|                                                     |                           |                                                                                                                                                                                                                                                                                                                               |                                                                                                                                               |     |      |
|-----------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>MR</b> Image Storage                             | 1.2.840.10008.5.1.4.1.1.4 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup>                                                    | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                           | SCU | None |
| <b>Ultrasound</b> Image Storage Retired             | 1.2.840.10008.5.1.4.1.1.6 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Ultrasound Multi-frame</b> Image Storage Retired | 1.2.840.10008.5.1.4.1.1.3 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>SC</b> Image Storage                             | 1.2.840.10008.5.1.4.1.1.7 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |

|                                              |                                         |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                               |     |      |
|----------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>X-Ray Angiographic Image Storage</b>      | 1.2.840.10008.5<br>1.4.1.1. <b>12.1</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>X-Ray Radiofluoroscopic Image Storage</b> | 1.2.840.10008.5<br>1.4.1.1. <b>12.2</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Nuclear Medicine Image Storage</b>        | 1.2.840.10008.5<br>1.4.1.1. <b>20</b>   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Ultrasound Image Storage</b>              | 1.2.840.10008.5.<br>1.4.1.1. <b>6.1</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |

|                                                   |                                       |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                               |     |      |
|---------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Ultrasound Multi-frame Image Storage</b>       | 1.2.840.10008.5.1.4.1.1. <b>3.1</b>   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Positron Emission Tomography Image Storage</b> | 1.2.840.10008.5.1.4.1.1. <b>128</b>   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Radio Therapy Image Storage</b>                | 1.2.840.10008.5.1.4.1.1. <b>481.1</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Radio Therapy Dose Storage</b>                 | 1.2.840.10008.5.1.4.1.1. <b>481.2</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                                                                                    | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCU | None |
| <b>Radio Therapy Plan Storage</b>                 | 1.2.840.10008.5.1.4.1.1. <b>481.5</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                                                                                    | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCU | None |

|                                                               |                                           |                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                               |     |      |
|---------------------------------------------------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Radio Therapy</b><br>Structure Set<br>Storage              | 1.2.840.10008.5.<br>1.4.1.1. <b>481.3</b> | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big En-<br>dian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCU | None |
| <b>Radio Therapy</b><br>Beams Treatment<br>Record Storage     | 1.2.840.10008.5.<br>1.4.1.1. <b>481.4</b> | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big En-<br>dian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCU | None |
| <b>Radio Therapy</b><br>Brachy Treatment<br>Record Storage    | 1.2.840.10008.5.<br>1.4.1.1. <b>481.6</b> | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big En-<br>dian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCU | None |
| <b>Radio Therapy</b><br>Treatment Record<br>Storage           | 1.2.840.10008.5.<br>1.4.1.1. <b>481.7</b> | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big En-<br>dian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCU | None |
| <b>Digital X-Ray</b> Im-<br>age Storage - For<br>Presentation | 1.2.840.10008.5.1.<br>4.1.1.1. <b>1</b>   | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big En-<br>dian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-<br>Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Digital X-Ray</b> Im-<br>age Storage - For<br>Processing   | 1.2.840.10008.5.1.<br>4.1.1.1. <b>1.1</b> | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big En-<br>dian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-<br>Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |

|                                                                   |                               |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                               |     |      |
|-------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Digital Mammography X-Ray</b> Image Storage - For Presentation | 1.2.840.10008.5.1.4.1.1.1.2   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Digital Mammography X-Ray</b> Image Storage - For Processing   | 1.2.840.10008.5.1.4.1.1.1.2.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Digital Intra-Oral X-Ray</b> Image Storage - For Presentation  | 1.2.840.10008.5.1.4.1.1.1.3   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |

|                                                                   |                                |                                                                                                                                                                                                                                                                                                                               |                                                                                                                                               |     |      |
|-------------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Digital Intra-Oral X-Ray</b> Image Storage<br>- For Processing | 1.2.840.10008.5.1.4.1.1.1.3.1  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Hardcopy Gray-scale</b> Image Storage                          | 1.2.840.10008.5.1.1.29         | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCU | None |
| <b>Hardcopy Color</b> Image Storage                               | 1.2.840.10008.5.1.1.30         | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup>                                                                                                                       | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50                                                     | SCU | None |
| <b>VL Endoscopic</b> Image Storage                                | 1.2.840.10008.5.1.4.1.1.77.1.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup>                                                          | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70                           | SCU | None |

|                                                |                                |                                                                                                                                                                                                                                                                   |                                                                                                                     |     |      |
|------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----|------|
| VL Microscopic Image Storage                   | 1.2.840.10008.5.1.4.1.1.77.1.2 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| VL Slide-Coordinates Microscopic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.3 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| VL Photographic Image Storage                  | 1.2.840.10008.5.1.4.1.1.77.1.4 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Basic Text SR                                  | 1.2.840.10008.5.1.4.1.1.88.11  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                     | SCU | None |
| Enhanced Text SR                               | 1.2.840.10008.5.1.4.1.1.88.22  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                     | SCU | None |
| Comprehensive SR                               | 1.2.840.10008.5.1.4.1.1.88.33  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                              | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                     | SCU | None |

|                                               |                                       |                                                                                                                                                      |                                                                 |     |      |
|-----------------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----|------|
| Mammography CAD SR                            | 1.2.840.10008.5.1.4.1.1. <b>88.50</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU | None |
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1. <b>11.1</b>  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU | None |
| Key Object Selection                          | 1.2.840.10008.5.1.4.1.1. <b>88.59</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU | None |

- a. If Lossy JPEG is selected at Send Dialog of the Application (8 bit images)
- b. If Lossy JPEG is selected at Send Dialog of the Application
- c. If Lossless JPEG is selected at Send Dialog of the Application

The default proposed transfer syntax is DICOM Implicit VR Little Endian Transfer Syntax.

### 3.1.2.2.3 SOP Specific Conformance Statement

The DICOM images sent by the Siemens SKY conform to the DICOM IOD definitions (Standard extended IODs).

### 3.1.2.3 Real-World Activity - Query the Image Database of a Remote Node

#### 3.1.2.3.1 Associated Real-World Activity - Query the Image Database of a Remote Node

The associated Real-World activity is a C-Find request initiated by the user of the Viewing station. The user specifies some attributes, the remote Application should use to query the database. If NI query user successfully establishes an association to the remote Application Entity, it will send one C-Find requests (according to the query model) and will then return the results to the Application of the SKY.

#### 3.1.2.3.2 Proposed Presentation Contexts

The Siemens SKY will propose Presentation Contexts as shown in the following tables.

**Table 3: Query SCU Presentation Contexts of SKY**

| Presentation Context Table                                 |                             |                                                                                                                                                     |                                                                 |      |                      |
|------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------|----------------------|
| Abstract Syntax                                            |                             | Transfer Syntax                                                                                                                                     |                                                                 | Role | Extended Negotiation |
| Name                                                       | UID                         | Name List                                                                                                                                           | UID List                                                        |      |                      |
| Patient Root Query/Retrieve Information Model - FIND       | 1.2.840.10008.5.1.4.1.2.1.1 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU  | Yes                  |
| Patient Study Only Query/Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.3.1 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU  | Yes                  |
| Study Root Query/Retrieve Information Model - FIND         | 1.2.840.10008.5.1.4.1.2.2.1 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU  | Yes                  |

The default proposed transfer syntax is DICOM Implicit VR Little Endian Transfer Syntax. The default SOP Class UID is Patient Root Query/Retrieve Information Model.

#### 3.1.2.3.3 SOP Specific Conformance Statement

NI query user uses hierarchical queries with retrieve level patient or study.

NI query user checks for the following status codes in the Query/Retrieve provider's response to the C-Find request:

- o SUCCESS (0000): Matching is complete
- o PENDING (FF00): Matches are continuing
- o PENDING (FF01): Matches are continuing, no optional key support
- o REFUSED (A700): Out of Resources
- o CANCEL (FE00)

NI query user queries the following attributes:

**Table 4:** *Supported attributes at Patient Level*

| Description                | Tag         |
|----------------------------|-------------|
| Patient's Name             | (0010,0010) |
| Patient ID                 | (0010,0020) |
| Patient's Birth Date       | (0010,0030) |
| Storage Media File Set ID  | (0088,0130) |
| Storage Media File Set UID | (0088,0140) |

**Table 5:** *Supported attributes at Study Level*

| Description                     | Tag         |
|---------------------------------|-------------|
| Study Date                      | (0008,0020) |
| Study ID                        | (0020,0010) |
| Study Time                      | (0008,0030) |
| Accession Number                | (0008,0050) |
| Referring Physician's Name      | (0008,0090) |
| Name of Physician Reading Study | (0008,1060) |
| Study Description               | (0008,1030) |
| Body Part Examined              | (0018,0015) |
| Study Instance UID              | (0020,000D) |
| Number of Study Related Images  | (0020,1208) |
| Storage Media File Set ID       | (0088,0130) |
| Storage Media File Set UID      | (0088,0140) |

**Table 6:** Supported Attributes at Series level:

| Description                | Tag                  |
|----------------------------|----------------------|
| Modality                   | (0008,0060)          |
| Series Description         | (0008,103E)          |
| Series Instance UID        | (0020,000E)          |
| Series Number              | (0020,0011)          |
| Requested Procedure ID     | (0040,1001)          |
| Body Part Examined         | (0018,0015)          |
| Exam Status                | (0095,"SIENET",0004) |
| Rebuild Status             | (0095,"SIENET",000C) |
| Storage Media File Set ID  | (0088,0130)          |
| Storage Media File Set UID | (0088,0140)          |

The Tag (0088,0130) is used with SIEMENS MagicStore to display Folder Status: "INSTORE", "NEAR-LINE" and "OFFLINE". The Tag (0018,0015) is used with SIEMENS MagicStore to display Organ Names.

On Study Level the Patient Name contains always a value.

The Maximum of Query Responses is configured to 20 entries, to limit the Query Time. A message gives information, that more entries are available, but not displayed because of the Query criteria.

The Maximum value can be changed by Configuration up to 100.

### 3.1.2.4 Real-World Activity - Retrieve Image Objects from a Remote Node

#### 3.1.2.4.1 Associated Real-World Activity - Retrieve Image Objects from a Remote Node

The associated Real-World activity is a C-Move request initiated by the user of the Viewing Station. The user selects one study from a list generated as a result of the previous C-Find operation. If NI query user successfully establishes an association to the remote Application Entity, it will cause the calling application via a C-Move request to transfer the images to the local Application Entity. The transfer of the images will be done by a subsequent C-Store and will return the results of the store operation to the calling application.

#### 3.1.2.4.2 Proposed Presentation Contexts

The Siemens SKY will propose Presentation Contexts as shown in the following tables.

**Table 7:** C-Move SCU Presentation Contexts of SKY

| Presentation Context Table                                 |                             |                                                                                                                                                     |                                                                 |      |                      |
|------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------|----------------------|
| Abstract Syntax                                            |                             | Transfer Syntax                                                                                                                                     |                                                                 | Role | Extended Negotiation |
| Name                                                       | UID                         | Name List                                                                                                                                           | UID List                                                        |      |                      |
| Patient Root Query/Retrieve Information Model - MOVE       | 1.2.840.10008.5.1.4.1.2.1.2 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU  | None                 |
| Patient Study Only Query/Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU  | None                 |
| Study Root Query/Retrieve Information Model - MOVE         | 1.2.840.10008.5.1.4.1.2.2.2 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCU  | None                 |

The default proposed transfer syntax is DICOM Implicit VR Little Endian Transfer Syntax.

### 3.1.2.4.3 SOP Specific Conformance Statement

The SKY Query/Retrieve SCU checks for the following status codes in the provider's response to a C-Move request:

- o SUCCESS (0000): Matching is complete
- o WARNING (B000): One or more Failures occurred
- o PENDING (FF00): Matches are continuing
- o CANCEL (FE00)

### 3.1.2.5 Real-World Activity - Query Worklist of a Remote Node

#### 3.1.2.5.1 Associated Real-World Activity - Query Worklist of a Remote Node

The associated Real-World activity is a C-Find request initiated by the user of the Viewing Station. The user specifies some attributes the remote Application should use to query its worklist database. If NI worklist successfully establishes an association to the remote Application Entity, it will send the C-Find request and will then return the results to the application of the SKY.

#### 3.1.2.5.2 Proposed Presentation Contexts

The Siemens SKY will propose Presentation Contexts as shown in the following table.

**Table 8:** Basic Worklist SCU Presentation Contexts of SKY

| Presentation Context Table                 |                        |                                                 |                     |      |                      |
|--------------------------------------------|------------------------|-------------------------------------------------|---------------------|------|----------------------|
| Abstract Syntax                            |                        | Transfer Syntax                                 |                     | Role | Extended Negotiation |
| Name                                       | UID                    | Name List                                       | UID List            |      |                      |
| Modality Worklist Information Model - FIND | 1.2.840.10008.5.1.4.31 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCU  | None                 |
|                                            |                        | DICOM Explicit VR Big Endian Transfer Syntax,   | 1.2.840.10008.1.2.2 |      |                      |
|                                            |                        | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |

The default proposed transfer syntax is DICOM Implicit VR Little Endian Transfer Syntax.

#### 3.1.2.5.3 SOP Specific Conformance Statement

The following DICOM Tags are sent to the Worklist Provider by the SKY:

R = Required, O = Optional

**Table 9:** Supported search key attributes

| Description                | Tag         | Type |
|----------------------------|-------------|------|
| Accession Number           | (0008,0050) | O    |
| Modality                   | (0008,0060) | R    |
| Referring Physician's Name | (0008,0090) | R    |
| Patient's Name             | (0010,0010) | R    |
| Patient's Birth Date       | (0010,0030) | O    |
| Patient ID                 | (0010,0020) | R    |

| Description                           | Tag         | Type |
|---------------------------------------|-------------|------|
| Patient's Sex                         | (0010,0040) | O    |
| Study Instance UID                    | (0020,000D) | O    |
| Scheduled Station AE Title            | (0040,0001) | R    |
| Scheduled Procedure Step Start Date   | (0040,0002) | R    |
| Scheduled Procedure Step Start Time   | (0040,0003) | R    |
| Scheduled Performing Physician's Name | (0040,0006) | R    |
| Scheduled Procedure Step ID           | (0040,0009) | O    |
| Scheduled Procedure Step Sequence     | (0040,0100) | R    |
| Requested Procedure ID                | (0040,1001) | O    |
| RequestedProcedure Code Sequence      | (0032,1064) | O    |
| > Code Value                          | (0008,0010) | O    |
| > Coding Scheme Designator            | (0008,0102) | O    |
| > Code Meaning                        | (0008,0104) | O    |
| Requested Procedure Priority          | (0040,1003) | O    |
| Issuer of Patient ID                  | (0010,0021) | O    |

The following attributes are passed to the worklist provider as part of a sequence: Scheduled Performing Physician's Name, Scheduled Station AE Title, Modality, Requested Procedure ID, Scheduled Procedure Step Start Date, Scheduled Procedure Step Start Time, Scheduled Procedure Step ID, Code Value, Coding Scheme Designator, Code Meaning.

The following DICOM Tags are read from the Worklist Provider's response message:

R = Required, O = Optional

**Table 10:** Supported return key attributes

| Description                | Tag         | Type |
|----------------------------|-------------|------|
| Accession Number           | (0008,0050) | O    |
| Modality                   | (0008,0060) | R    |
| Referring Physician's Name | (0008,0090) | R    |
| Series Description         | (0008,103E) | O    |
| Study Description          | (0008,1030) | O    |
| Patient's Name             | (0010,0010) | R    |
| Patient's Birth Date       | (0010,0030) | O    |
| Patient ID                 | (0010,0020) | R    |

| Description                           | Tag         | Type |
|---------------------------------------|-------------|------|
| Patient's Sex                         | (0010,0040) | O    |
| Study Instance UID                    | (0020,000D) | O    |
| Series Instance UID                   | (0020,000E) | O    |
| Study ID                              | (0020,0010) | O    |
| Series Number                         | (0020,0011) | O    |
| Study Comments                        | (0032,4000) | O    |
| Scheduled Station AE Title            | (0040,0001) | R    |
| Scheduled Procedure Step Start Date   | (0040,0002) | R    |
| Scheduled Procedure Step Start Time   | (0040,0003) | R    |
| Scheduled Performing Physician's Name | (0040,0006) | R    |
| Scheduled Procedure Step ID           | (0040,0009) | O    |
| Scheduled Procedure Step Sequence     | (0040,0100) | R    |
| Requested Procedure ID                | (0040,1001) | O    |
| RequestedProcedure Code Sequence      | (0032,1064) | O    |
| > Code Value                          | (0008,0010) | O    |
| > Coding Scheme Designator            | (0008,0102) | O    |
| > Code Meaning                        | (0008,0104) | O    |
| Requested Procedure Priority          | (0040,1003) | O    |
| Issuer of Patient ID                  | (0010,0021) | O    |

The following attributes are expected to be part of a sequence: Scheduled Performing Physician's Name, Scheduled Station AE Title, Modality, Scheduled Procedure Step Start Date, Scheduled Procedure Step Start Time, Scheduled Procedure Step ID, Study ID, Study Description, Code Value, Coding Scheme Designator, Code Meaning.

The SKY Basic Worklist SCU checks for the following status codes in the provider's response to the C-Find request:

- o SUCCESS (0000): Matching is complete
- o PENDING (FF00): Matches are continuing
- o PENDING (FF01): Matches are continuing, no optional key support
- o CANCEL (FE00)

### 3.1.2.6 Real-World Activity - Send Print Request to a Remote Node

#### Associated Real-World Activity - Send Print Request to a Remote Node

The associated Real-World activity is a folder print request initiated by the user of the workstation. If the DBP successfully establishes an association to the remotepriinter Application Entity, it will send N\_GET, N\_CREATE, N\_SET, N\_ACTION and N\_DELETE requests to the remote printer.

The Print Job SOP Class accepts is monitoring the printer status.

The Siemens SKY will propose Presentation Contexts as shown in the following tables.

**Table 11:** SKY Print Management SCU Presentation Contexts of

| Presentation Context Table        |                        |                                                 |                   |      |                                 |
|-----------------------------------|------------------------|-------------------------------------------------|-------------------|------|---------------------------------|
| Abstract Syntax                   |                        | Transfer Syntax                                 |                   | Role | Extend<br>ed<br>Negotia<br>tion |
| Name                              | UID                    | Name List                                       | UID List          |      |                                 |
| Basic Grayscale Print Management  | 1.2.840.10008.5.1.1.9  | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2 | SCU  | None                            |
| Basic Color Print Management Meta | 1.2.840.10008.5.1.1.18 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2 | SCU  | None                            |

Siemens MagicView supports the following mandatory SOP Classes as defined by the Basic Grayscale Print Management Meta Class:

| SOP Class Name                      | SOP Class UID          |
|-------------------------------------|------------------------|
| 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 |

DBP does not support any optional SOP Classes.

Siemens MagicView supports the following mandatory SOP Classes as defined by the Basic Color Print Management Meta Class:

| SOP Class Name                  | SOP Class UID           |
|---------------------------------|-------------------------|
| 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 Film Session SOP Class

The Basic Film Session information object definition describes all the user defined parameters which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes, that are printed on a hardcopy printer.

**Table 12:** *Used DIMSE services*

| DIMSE Service Element | Usage SCU/SCP |
|-----------------------|---------------|
| N-CREATE              | M/M           |
| N-DELETE              | U/M           |

**Table 13:** *Supported N\_CREATE attributes*

| Attribute name     | Tag       | Usage SCU/SCP | Supported Values        |
|--------------------|-----------|---------------|-------------------------|
| Number of Copies   | 2000,0010 | U/M           | >0                      |
| Print Priority     | 2000,0020 | U/M           | HIGH<br>MED<br>LOW      |
| Medium Type        | 2000,0030 | U/M           | CLEAR FILM<br>BLUE FILM |
| Film Destination   | 2000,0040 | U/M           | PROCESSOR               |
| Film Session Label | 2000,0050 | U/M           |                         |

After use the Basic Film Session is closed with N\_DELETE.

**Table 14:** Status handling

| Service Status | Meaning                                                                                  | Protocol Codes |
|----------------|------------------------------------------------------------------------------------------|----------------|
| Success        | Film Session successfully created                                                        | 0000           |
| Warning        | Memory allocation not supported                                                          | B600           |
| Warning        | Attribute Value Out of Range                                                             | 0116           |
| Warning        | Film session printing (collation) is not supported                                       | B601           |
| Warning        | Film session SOP Instance hierarchy does not contain Image Box SOP Instance (empty page) | B602           |
| Warning        | Image size is larger than image box size, the image has been demagnified.                | B604           |
| Failure        | Missing attribute value                                                                  | 0121           |
| Failure        | Unable to create print job, print queue is full (Film Session)                           | C601           |
| Failure        | Image size is larger than image box size                                                 | C603           |
| Failure        | Insufficient memory in printer to store the image                                        | C605           |
| Failure        | More than one VOI LUT Box contained in image                                             | C606           |
| Failure        | No such argument                                                                         | 0114           |
| Failure        | Processing Failure                                                                       | 0110           |
| Failure        | Unrecognized Operation                                                                   | 0211           |

## Basic Film Box SOP Class

The Basic Film Box information object definition describes all the user defined parameters of one film of the film session. The Basic Film Box information description defines the presentation parameters which are common for all images on a given sheet of film.

**Table 15:** *Used DIMSE services*

| DIMSE Service Element | Usage SCU/SCP |
|-----------------------|---------------|
| N-CREATE              | M/M           |
| N-ACTION              | M/M           |

**Table 16:** *Mandatory Film Box N-Create attributes*

| Attribute name                   | Tag       | Usage SCU/SCP | Supported Values                                                                                                                                                                           |
|----------------------------------|-----------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Image Display Format             | 2010,0010 | M/M           | STANDARD\1,1<br>STANDARD\2,1<br>STANDARD\1,2<br>STANDARD\2,2<br>STANDARD\2,3<br>STANDARD\3,3<br>STANDARD\3,4<br>STANDARD\4,4<br>STANDARD\4,5<br>STANDARD\5,6<br>ROW2,3,3,3<br>ROW3,4,4,4,4 |
| Referenced Film Session Sequence | 2010,0500 | M/M           |                                                                                                                                                                                            |
| >Referenced SOP Class UID        | 0008,1150 | M/M           |                                                                                                                                                                                            |
| >Referenced SOP Instance UID     | 0008,1155 | M/M           |                                                                                                                                                                                            |
| Referenced Image Box Sequence    | 2010,0510 | -/M           |                                                                                                                                                                                            |
| >Referenced SOP Class UID        | 0008,1150 | -/M           |                                                                                                                                                                                            |
| >Referenced SOP Instance UID     | 0008,1155 | -/M           |                                                                                                                                                                                            |
| Film Orientation                 | 2010,0040 | M/M           | PORTRAIT,<br>LANDSCAPE                                                                                                                                                                     |

**Table 16:** Mandatory Film Box N>Create attributes

| Attribute name            | Tag       | Usage SCU/SCP | Supported Values                                                                                                               |
|---------------------------|-----------|---------------|--------------------------------------------------------------------------------------------------------------------------------|
| Film Size ID              | 2010,0050 | M/M           | 8INX10IN<br>8_5INX11IN<br>10INX12IN<br>10INX14IN<br>11INX14IN<br>11INX17IN<br>14INX14IN<br>14INX17IN<br>24CMX24CM<br>24CMX30CM |
| Magnification Type        | 2010,0060 | M/M           | REPLICATE<br>BILINEAR<br>CUBIC<br>NONE                                                                                         |
| Smoothing Type            | 2010,0080 | M/M           | Values are defined in Conformance Statement. Only valid for Magnification Type (2010,0060) = CUBIC                             |
| Border Density            | 2010,0100 | M/M           | BLACK<br>WHITE                                                                                                                 |
| Empty Image Density       | 2010,0110 | M/M           | BLACK<br>WHITE                                                                                                                 |
| Min Density               | 2010,0120 | M/M           | >=0                                                                                                                            |
| Max Density               | 2010,0130 | M/M           | >0                                                                                                                             |
| Trim                      | 2010,0140 | M/M           | YES<br>NO                                                                                                                      |
| Configuration Information | 2010,0150 | M/M           | CS000-CS999                                                                                                                    |

N\_ACTION is used to start printing.

**Table 17: Status handling**

| Service Status | Meaning                                                                                                                                                  | Protocol Codes |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Success        | Film Box successfully created                                                                                                                            | 0000           |
| Warning        | Requested Min Density or Max Density outside of printer's operating range. The printer will use its respective minimum or maximum density value instead. | B605           |
| Warning        | Film box does not contain image box (empty page) box (empty page)                                                                                        | B603           |
| Warning        | Image size is larger than image box size, the image has been demagnified.                                                                                | B604           |
| Failure        | Invalid attribute value                                                                                                                                  | 0106           |
| Failure        | Unable to create print job SOP Instance, print queue is full (Film Box)                                                                                  | C602           |
| Failure        | Image size is larger than image box size                                                                                                                 | C603           |
| Failure        | Resource limitation                                                                                                                                      | 0213           |
| Failed         | Unrecognized Operation                                                                                                                                   | 0211           |

## Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information description describes the presentation parameters and image pixel data which apply to a single image of a sheet of film.

**Table 18:** Used DIMSE services

| DIMSE Service Element | Usage SCU/SCP |
|-----------------------|---------------|
| N-SET                 | M/M           |

**Table 19:** Supported N\_SET attributes

| Attribute name                 | Tag       | Usage SCU/SCP | Supported Values                |
|--------------------------------|-----------|---------------|---------------------------------|
| Image Position                 | 2020,0010 | M/M           | Dependent on Display Format     |
| Basic Grayscale Image Sequence | 0020,0110 | M/M           |                                 |
| >Sample Per Pixel              | 0028,0002 | M/M           | 1                               |
| >Photometric Interpretation    | 0028,0004 | M/M           | MONOCHROME2                     |
| >Rows                          | 0028,0010 | M/M           | Dependent on Printer and Format |
| >Columns                       | 0028,0011 | M/M           | Dependent on Printer and Format |
| >Pixel Aspect Ratio            | 0028,0034 | M/M           |                                 |
| >Bits Allocated                | 0028,0100 | M/M           | 8                               |
| >Bits Stored                   | 0028,0101 | M/M           | 8                               |
| >High Bit                      | 0028,0102 | M/M           | 7                               |
| >Pixel Representation          | 0028,0103 | M/M           | 0                               |
| >Pixel Data                    | 7FE0,0010 | M/M           |                                 |

## Basic Color Image Box SOP Class

The Basic Color Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information description describes the presentation parameters and image pixel data which apply to a single image of a sheet of film.

**Table 20:** *Used DIMSE services*

| DIMSE Service Element | Usage SCU/SCP |
|-----------------------|---------------|
| N-SET                 | M/M           |

**Table 21:** *Supported N\_SET attributes*

| Attribute name              | Tag       | Usage SCU/SCP | Supported Values                |
|-----------------------------|-----------|---------------|---------------------------------|
| Image Position              | 2020,0010 | M/M           | Dependent on Display Format     |
| Basic Color Image Sequence  | 0020,0111 | M/M           |                                 |
| >Sample Per Pixel           | 0028,0002 | M/M           | 1                               |
| >Photometric Interpretation | 0028,0004 | M/M           |                                 |
| >Planar Configuration       | 0028,0006 | M/M           |                                 |
| >Rows                       | 0028,0010 | M/M           | Dependent on Printer and Format |
| >Columns                    | 0028,0011 | M/M           | Dependent on Printer and Format |
| >Pixel Aspect Ratio         | 0028,0034 | M/M           |                                 |
| >Bits Allocated             | 0028,0100 | M/M           | 8                               |
| >Bits Stored                | 0028,0101 | M/M           | 8                               |
| >High Bit                   | 0028,0102 | M/M           | 7                               |
| >Pixel Representation       | 0028,0103 | M/M           | 0                               |
| >Pixel Data                 | 7FE0,0010 | M/M           |                                 |

## Printer SOP Class

The Printer SOP Class provides the possibility to monitor the status of the hardcopy printer in a synchronous way.

**Table 22:** Used DIMSE services

| DIMSE Service Element | Usage SCU/SCP |
|-----------------------|---------------|
| N-GET                 | U/M           |

The SKY writes all warning and failure messages into a log file.

**Table 23:** Mandatory Printer N-GET attributes.

| Attribute name      | Tag       | Usage SCU/SCP |
|---------------------|-----------|---------------|
| Printer Status      | 2110,0010 | U/M           |
| Printer Status Info | 2110,0020 | U/M           |

## SOP Specific Conformance Statement

Only one association will be processed at a time.

In case of a failure return status of the Print SCP, the current job will be suspended.

:

**Table 24:** Default values for timing demands

| Definition                                   | Registry Entry Default  | Default Value |
|----------------------------------------------|-------------------------|---------------|
| No. of retries on Print Error                | PrintRetryNumber        | 5             |
| Retry starts after a specified time interval | PrintRetryTimeDelay     | 180 sec.      |
| Timeout on Printing                          | PrintReadMessageTimeout | 300 sec.      |
| Timeout of not closed association            | AssocTimeout            | 10 Min.       |

### 3.1.2.7 Real-World Activity - Storage Commitment SCU

#### 3.1.2.7.1 Associated Real-World Activity

The SKY DICOM Application Entity acts as a Service Class User (SCU) for the Storage Commitment Push Model Service Class (i.e. it requests commitment for storage of instances previously sent). To do so, the SKY will issue a

- N-ACTION DIMSE to request commitment or a
- N-EVENT-REPORT DIMSE to respond to a received storage commitment request.

If the configuration setting "Automatic request for Storage Commitment" is enabled and the send destination is also configured as a storage commitment SCP, then the MV300 requests for a storage commitment of the instances which have been successfully sent.

As soon as a commitment is requested for a set of instances, the archived status of these instances in the local database will be set to "For Archival".

When the SC SCU receives the corresponding notification status (N-Event-Report), it updates the archived status of these instances to "Archived" in case of success and "Not Archived" in case of failure. The MV300 SC SCU waits for a configurable time for the commitment notification from the SC SCP. If the MV300 does not receive any notification within this duration, it updates the archived status of the referenced instances to "Not Archived" which means that the commitment request failed. This timeout is termed as "Event Receipt Timeout" and the default value is 1 day.

#### 3.1.2.7.2 Proposed Presentation Contexts

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

**Table 25:** SC SCU Presentation Contexts of SKY

| 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 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCU  | None                 |
|                               |                      | DICOM Explicit VR Big Endian Transfer Syntax,   | 1.2.840.10008.1.2.2 |      |                      |
|                               |                      | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |

#### 3.1.2.7.3 SOP Specific Conformance Statement

Storage Commitment is supported for all the SOP class UIDs as mentioned in tables 2 and 27. The Referenced Study Component Sequence is not supported.

### 3.1.3 Association Acceptance Policy

The Siemens SKY accepts a new association for

- o DIMSE-C-Echo
- o DIMSE-C-Store
- o DIMSE-C-Find
- o DIMSE-C-Move
- o DIMSE-N-Action
- o DIMSE-N-Event-Report

service operation.

#### 3.1.3.1 Real-World Activity - Receive Echo

##### 3.1.3.1.1 Associated Real-World Activity - respond to echo request

The associated Real-World activity is a C-Echo response by NI receive and NI query provider.

##### 3.1.3.1.2 Proposed Presentation Contexts

The Siemens MagicView will accept Presentation Contexts as shown in the following table.

**Table 26:** Echo SCP Presentation Contexts of SKY

| Presentation Context Table |                   |                                                 |                     |      |                      |
|----------------------------|-------------------|-------------------------------------------------|---------------------|------|----------------------|
| Abstract Syntax            |                   | Transfer Syntax                                 |                     | Role | Extended Negotiation |
| Name                       | UID               | Name List                                       | UID List            |      |                      |
| Verification Service Class | 1.2.840.10008.1.1 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCP  | None                 |
|                            |                   | DICOM Explicit VR Big Endian Transfer Syntax    | 1.2.840.10008.1.2.2 |      |                      |
|                            |                   | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |
|                            |                   |                                                 |                     |      |                      |

##### 3.1.3.1.3 SOP Specific Conformance to the Verification SOP Class

The DICOM MagicView provides standard conformance to the DICOM Verification Service Class.

### 3.1.3.2 Real-World Activity - Receive Image Objects from a Remote Node

#### 3.1.3.2.1 Associated Real-World Activity -Receive Image Objects from a Remote Node

The associated Real-World activity is a C-Store request received by NI receive. After accepting an association from a remote DICOM AE, the NI receive thread receives the images via the open association.

Images are stored into the MV300 database as soon as they are received. After an image is stored into the database, NI sends a successful C-Store response back to the sender. This process repeats until

- association is closed by the sender or
- image storage fails due to some reason (in this case the MV300 sends a failure response and aborts the association or
- the association is lost (because of timeouts, network unexpectedly shutdown, ...).

#### 3.1.3.2.2 Accepted Presentation Contexts

The Siemens MagicViews will accept Presentation Contexts as shown in the following tables.

**Table 27:** STORE SCP Accepted Presentation Contexts of SKY

| Presentation Context Table |                           |                                                  |                        |      |                      |
|----------------------------|---------------------------|--------------------------------------------------|------------------------|------|----------------------|
| Abstract Syntax            |                           | Transfer Syntax                                  |                        | Role | Extended Negotiation |
| Name                       | UID                       | Name List                                        | UID List               |      |                      |
| CR Image Storage           | 1.2.840.10008.5.1.4.1.1.1 | DICOM Implicit VR Little Endian Transfer Syntax, | 1.2.840.10008.1.2      | SCP  | None                 |
|                            |                           | DICOM Explicit VR Big Endian Transfer Syntax,    | 1.2.840.10008.1.2.2    |      |                      |
|                            |                           | DICOM Explicit VR Little Endian Transfer Syntax  | 1.2.840.10008.1.2.1    |      |                      |
|                            |                           | JPEG Baseline (Process 1) Lossy                  | 1.2.840.10008.1.2.4.50 |      |                      |
|                            |                           | JPEG Extended (Process 2 und 4) Lossy            | 1.2.840.10008.1.2.4.51 |      |                      |
|                            |                           | JPEG Lossless, Non-Hierarchical (Process 14)     | 1.2.840.10008.1.2.4.70 |      |                      |
|                            |                           |                                                  |                        |      |                      |
| CT Image Storage           | 1.2.840.10008.5.1.4.1.1.2 | DICOM Implicit VR Little Endian Transfer Syntax, | 1.2.840.10008.1.2      | SCP  | None                 |
|                            |                           | DICOM Explicit VR Big Endian Transfer Syntax,    | 1.2.840.10008.1.2.2    |      |                      |
|                            |                           | DICOM Explicit VR Little Endian Transfer Syntax  | 1.2.840.10008.1.2.1    |      |                      |
|                            |                           | JPEG Extended (Process 2 und 4) Lossy            | 1.2.840.10008.1.2.4.51 |      |                      |
|                            |                           | JPEG Lossless, Non-Hierarchical (Process 14)     | 1.2.840.10008.1.2.4.70 |      |                      |
|                            |                           |                                                  |                        |      |                      |

|                                                     |                             |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                      |     |      |
|-----------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>MR Image Storage</b>                             | 1.2.840.10008.5.1.4.1.1.4   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                                                    | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                                                  | SCP | None |
| <b>Ultrasound Image Storage Retired</b>             | 1.2.840.10008.5.1.4.1.1.6   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                 | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                        | SCP | None |
| <b>Ultrasound Multi-frame Image Storage Retired</b> | 1.2.840.10008.5.1.4.1.1.3   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                 | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                        | SCP | None |
| <b>Ultrasound Image Storage</b>                     | 1.2.840.10008.5.1.4.1.1.6.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)<br>RLE Lossless | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70<br>1.2.840.10008.1.2.5 | SCP | None |

|                                              |                              |                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                      |     |      |
|----------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Ultrasound Multiframe Image Storage</b>   | 1.2.840.10008.5.1.4.1.1.3.1  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)<br>RLE Lossless | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70<br>1.2.840.10008.1.2.5 | SCP | None |
| <b>SC Image Storage</b>                      | 1.2.840.10008.5.1.4.1.1.7    | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                 | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                        | SCP | None |
| <b>X-Ray Angiographic Image Storage</b>      | 1.2.840.10008.5.1.4.1.1.12.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                 | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                        | SCP | None |
| <b>X-Ray Radiofluoroscopic Image Storage</b> | 1.2.840.10008.5.1.4.1.1.12.2 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                 | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70                        | SCP | None |

|                                                        |                                   |                                                                                                                                                                                                                                                                                  |                                                                                                                                                   |     |      |
|--------------------------------------------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Nuclear Medicine</b><br>Image Storage               | 1.2.840.10008.5<br>1.4.1.1.20     | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14) | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Positron Emission Tomography</b> Im-<br>age Storage | 1.2.840.10008.5.<br>1.4.1.1.128   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14) | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Radio Therapy</b> Im-<br>age Storage                | 1.2.840.10008.5.<br>1.4.1.1.481.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14) | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Radio Therapy</b><br>Dose Storage                   | 1.2.840.10008.5.<br>1.4.1.1.481.2 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                                             | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCP | None |
| <b>Radio Therapy</b> Plan<br>Storage                   | 1.2.840.10008.5.<br>1.4.1.1.481.5 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                                             | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCP | None |
| <b>Radio Therapy</b><br>Structure Set<br>Storage       | 1.2.840.10008.5.<br>1.4.1.1.481.3 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                                                                                             | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1                                                                               | SCP | None |

|                                                               |                                             |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |     |      |
|---------------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Radio Therapy</b><br>Beams Treatment<br>Record Storage     | 1.2.840.10008.5.<br>1.4.1.1. <b>481.4</b>   | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big<br>Endian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                                             | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                                                                                           | SCP | None |
| <b>Radio Therapy</b><br>Brachy Treatment<br>Record Storage    | 1.2.840.10008.5.<br>1.4.1.1. <b>481.6</b>   | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big<br>Endian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                                             | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                                                                                           | SCP | None |
| <b>Radio Therapy</b><br>Treatment Record<br>Storage           | 1.2.840.10008.5.<br>1.4.1.1. <b>481.7</b>   | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big<br>Endian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax                                                                                                                                                                                             | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                                                                                           | SCP | None |
| <b>Digital X-Ray</b> Image<br>Storage - For Pre-<br>sentation | 1.2.840.10008.5.<br>1.4.1.1.1. <b>1.1</b>   | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big<br>Endian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax<br><br>JPEG Baseline<br>(Process 1) Lossy<br><br>JPEG Extended<br>(Process 2 und 4) Lossy<br><br>JPEG Lossless, Non-<br>Hierarchical (Process 14)                                           | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1<br><br>1.2.840.10008.1.2.4.50<br><br>1.2.840.10008.1.2.4.51<br><br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Digital X-Ray</b> Image<br>Storage - For Pro-<br>cessing   | 1.2.840.10008.5.1.<br>4.1.1.1. <b>1.1.1</b> | DICOM Implicit VR Little<br>Endian Transfer Syntax,<br>DICOM Explicit VR Big<br>Endian Transfer Syntax,<br>DICOM Explicit VR Little<br>Endian Transfer Syntax<br><br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup><br><br>JPEG Extended<br>(Process 2 und 4) Lossy <sup>2</sup><br><br>JPEG Lossless, Non-<br>Hierarchical (Process<br>14) <sup>3</sup> | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1<br><br>1.2.840.10008.1.2.4.50<br><br>1.2.840.10008.1.2.4.51<br><br>1.2.840.10008.1.2.4.70 | SCP | None |

|                                                                   |                               |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                               |     |      |
|-------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Digital Mammography X-Ray</b> Image Storage - For Presentation | 1.2.840.10008.5.1.4.1.1.1.2   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                                        | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Digital Mammography X-Ray</b> Image Storage - For Processing   | 1.2.840.10008.5.1.4.1.1.1.2.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Digital Intra-Oral X-Ray</b> Image Storage - For Presentation  | 1.2.840.10008.5.1.4.1.1.1.3   | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy<br>JPEG Extended (Process 2 und 4) Lossy<br>JPEG Lossless, Non-Hierarchical (Process 14)                                        | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |

|                                                                |                                |                                                                                                                                                                                                                                                                                                                         |                                                                                                                                               |     |      |
|----------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----|------|
| <b>Digital Intra-Oral X-Ray</b> Image Storage - For Processing | 1.2.840.10008.5.1.4.1.1.1.3.1  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Hardcopy Gray-scale</b> Image Storage                       | 1.2.840.10008.5.1.1.29         | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup><br>JPEG Extended (Process 2 und 4) Lossy <sup>2</sup><br>JPEG Lossless, Non-Hierarchical (Process 14) <sup>3</sup> | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.51<br>1.2.840.10008.1.2.4.70 | SCP | None |
| <b>Hardcopy Color</b> Image Storage                            | 1.2.840.10008.5.1.1.30         | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup>                                                                                                                    | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50                                                     | SCP | None |
| <b>VL Endoscopic</b> Image Storage                             | 1.2.840.10008.5.1.4.1.1.77.1.1 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline (Process 1) Lossy <sup>1</sup>                                                                                                                    | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1<br>1.2.840.10008.1.2.4.50                                                     | SCP | None |

|                                                |                                |                                                                                                                                                                                                         |                                                                                                       |     |      |
|------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----|------|
| VL Microscopic Image Storage                   | 1.2.840.10008.5.1.4.1.1.77.1.2 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup> | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1<br><br>1.2.840.10008.1.2.4.50 | SCP | None |
| VL Photographic Image Storage                  | 1.2.840.10008.5.1.4.1.1.77.1.4 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup> | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1<br><br>1.2.840.10008.1.2.4.50 | SCP | None |
| VL Slide-Coordinates Microscopic Image Storage | 1.2.840.10008.5.1.4.1.1.77.1.3 | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax<br>JPEG Baseline<br>(Process 1) Lossy <sup>1</sup> | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1<br><br>1.2.840.10008.1.2.4.50 | SCP | None |
| Basic Text SR                                  | 1.2.840.10008.5.1.4.1.1.88.11  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                    | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                               | SCP | None |
| Enhanced Text SR                               | 1.2.840.10008.5.1.4.1.1.88.22  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                    | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                               | SCP | None |
| Comprehensive SR                               | 1.2.840.10008.5.1.4.1.1.88.33  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                    | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                               | SCP | None |
| Mammography CAD SR                             | 1.2.840.10008.5.1.4.1.1.88.50  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax                                                    | 1.2.840.10008.1.2<br><br>1.2.840.10008.1.2.2<br><br>1.2.840.10008.1.2.1                               | SCP | None |

|                                               |                                       |                                                                                                                                                      |                                                                 |     |      |
|-----------------------------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----|------|
| Grayscale Softcopy Presentation State Storage | 1.2.840.10008.5.1.4.1.1. <b>11.1</b>  | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCP | None |
| Key Object Selection                          | 1.2.840.10008.5.1.4.1.1. <b>88.59</b> | DICOM Implicit VR Little Endian Transfer Syntax,<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCP | None |

### 3.1.3.2.3 SOP Specific Conformance Statement

n.a.

### 3.1.3.3 Real World Activity - Receive Query Request from a Remote Node

#### 3.1.3.3.1 Associated Real World Activity - Respond to Find Request

The associated Real-World activity is a C-Find request received by the NI query provider. After accepting an association from a remote DICOM AE the NI query provider receives the query requests via the open association and queries the database. For each match a result message is sent to the requesting remote node.

#### 3.1.3.3.2 Accepted Presentation Contexts

The Siemens MagicViews will accept Presentation Contexts as shown in the following tables.

**Table 28:** Query SCP Presentation Contexts of SKY

| Presentation Context Table                                 |                             |                                                                                                                                                     |                                                                 |      |                      |
|------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------|----------------------|
| Abstract Syntax                                            |                             | Transfer Syntax                                                                                                                                     |                                                                 | Role | Extended Negotiation |
| Name                                                       | UID                         | Name List                                                                                                                                           | UID List                                                        |      |                      |
| Patient Root Query/Retrieve Information Model - FIND       | 1.2.840.10008.5.1.4.1.2.1.1 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCP  | Yes                  |
| Patient Study Only Query/Retrieve Information Model - FIND | 1.2.840.10008.5.1.4.1.2.3.1 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCP  | Yes                  |
| Study Root Query/Retrieve Information Model - FIND         | 1.2.840.10008.5.1.4.1.2.2.1 | DICOM Implicit VR Little Endian Transfer Syntax<br>DICOM Explicit VR Big Endian Transfer Syntax,<br>DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.1 | SCP  | Yes                  |

#### 3.1.3.3.3 SOP Specific Conformance Statement

- o Relational queries are supported.

The fields supported for relational query are Study Date on Study Level and Modality, Body Part Examined, Series Description, Exam Status and Rebuild Status on Series Level.

- o The query matching is case insensitive.

- o The DICOM SKY Query Provider returns one of the following status codes:
  - Success (0000): Matching is complete
  - Pending (FF00): Matches are continuing
  - Failed (A900): Invalid Parameters
  - Refused (A700): Out of Resources
  - Cancel (FE00)

### **3.1.3.3.1 Patient Root C-Find SOP Class Specific Conformance Statement**

R = Required, U = Unique, O = Optional

**Table 29:** *Supported Patient Level Attributes*

| Description          | Tag         | Type |
|----------------------|-------------|------|
| Patient's Name       | (0010,0010) | R    |
| PatientID            | (0010,0020) | O    |
| Patient's Birth Date | (0010,0030) | O    |
| Patient's Sex        | (0010,0040) | O    |

**Table 30:** *Supported Study Level Attributes*

| Description                    | Tag         | Type |
|--------------------------------|-------------|------|
| Study Date                     | (0008,0020) | R    |
| Study Time                     | (0008,0030) | R    |
| Accession Number               | (0008,0050) | R    |
| Referring Physician's Name     | (0008,0090) | O    |
| Study Description              | (0008,1030) | O    |
| Study ID                       | (0020,0010) | R    |
| Study Instance UID             | (0020,000D) | U    |
| Number of Study related Images | (0020,1208) | O    |

**Table 31:** Supported Series Level Attributes

| Description                     | Tag         | Type |
|---------------------------------|-------------|------|
| Modality                        | (0008,0060) | R    |
| Series Description              | (0008,103E) | O    |
| Body Part Examined              | (0018,0015) | O    |
| Series Instance UID             | (0020,000E) | U    |
| Series Number                   | (0020,0011) | R    |
| Requested Procedure ID          | (0040,1001) | O    |
| Number of Series Related Images | (0020,1209) | O    |
| Storage Media File Set ID       | (0088,0130) | O    |

### 3.1.3.3.2 Study Root C-Find SOP Class Specific Conformance Statement

*Table 32: Supported Study Level attributes*

| Description                    | Tag         | Type |
|--------------------------------|-------------|------|
| Study Date                     | (0008,0020) | R    |
| Study Time                     | (0008,0030) | R    |
| Accession Number               | (0008,0050) | R    |
| Referring Physician's Name     | (0008,0090) | O    |
| Study Description              | (0008,1030) | O    |
| Patient's Name                 | (0010,0010) | R    |
| Patient's Birth Date           | (0010,0030) | O    |
| Patient ID                     | (0010,0020) | O    |
| Patient's Sex                  | (0010,0040) | O    |
| Study Instance UID             | (0020,000D) | U    |
| Study ID                       | (0020,0010) | R    |
| Number of Study related Images | (0020,1208) | O    |

- o The same Series level attributes as in the Patient Root C-Find SOP Class are supported.

### 3.1.3.3.3 Patient/Study Only C-Find SOP Class Specific Conformance Statement

- o The same Patient level attributes as in the Patient Root C-Find SOP Class are supported.
- o The same Study level attributes as in the Patient Root C-Find SOP Class are supported.

### 3.1.3.4 Real-World Activity - Receive Transfer Request from a Remote Node

#### 3.1.3.4.1 Associated Real-World Activity - Initiate Image Transfer

The associated Real-World activity is a C-Move request received by the NI query provider. After accepting an association from a remote DICOM AE, the NI query provider receives the move request via the open association and queries the database. The requested images are sent to the requested remote node.

#### 3.1.3.4.2 Accepted Presentation Contexts

The Siemens SKY will accept Presentation Contexts as shown in the following table.

**Table 33:** Retrieve SCP Presentation Contexts of SKY

| Presentation Context Table                                 |                             |                                                 |                     |      |                      |
|------------------------------------------------------------|-----------------------------|-------------------------------------------------|---------------------|------|----------------------|
| Abstract Syntax                                            |                             | Transfer Syntax                                 |                     | Role | Extended Negotiation |
| Name                                                       | UID                         | Name List                                       | UID List            |      |                      |
| Patient Root Query/Retrieve Information Model - MOVE       | 1.2.840.10008.5.1.4.1.2.1.2 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCP  | None                 |
|                                                            |                             | DICOM Explicit VR Big Endian Transfer Syntax,   | 1.2.840.10008.1.2.2 |      |                      |
|                                                            |                             | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |
| Patient Study Only Query/Retrieve Information Model - MOVE | 1.2.840.10008.5.1.4.1.2.3.2 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCP  | None                 |
|                                                            |                             | DICOM Explicit VR Big Endian Transfer Syntax,   | 1.2.840.10008.1.2.2 |      |                      |
|                                                            |                             | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |
| Study Root Query/Retrieve Information Model - MOVE         | 1.2.840.10008.5.1.4.1.2.2.2 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCP  | None                 |
|                                                            |                             | DICOM Explicit VR Big Endian Transfer Syntax,   | 1.2.840.10008.1.2.2 |      |                      |
|                                                            |                             | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |

### **3.1.3.4.3 SOP Specific Conformance Statement**

The NI query provider sends one of the following status codes to the Query/Retrieve SCU in response to a C-Move request:

- o SUCCESS (0000): Matching is complete
- o PENDING (FF00): Matches are continuing
- o FAILED (A900): Invalid parameters
- o FAILED (C001): Unable to process
- o REFUSED (A801): Destination unknown
- o CANCEL (FE00)

#### **3.1.3.4.3.1 SOP Specific Conformance Statement for SOP Class C-Store**

The NI query provider initiates C-Store sub-operations using the Presentation Contexts listed in 2.1.3.2.2.

### 3.1.3.5 Real-World Activity - Storage Commitment SCP

#### 3.1.3.5.1 Associated Real-World Activity

The SKY DICOM Application Entity acts as a Service Class Provider (SCP) for the Storage Commitment Push Model Service Class (i.e. it gives commitment to store previously received instances).

To do so, the SKY attempts to accept a

- N-ACTION DIMSE to receive a commitment request for the instance included or a
- N-EVENT-REPORT DIMSE to receive a storage commitment response from a previous request.

On receiving a commitment request, the SC SCP waits for a configured time for the referenced SOP instances to be successfully burnt onto a CD/DVD. If this does not happen within the configured time, it sends N-EVENT-REPORT to the SC SCU with the Event Type ID set to 2 and the failure reason always set to "The operation timed out".

The timeout is called the "Media Burn Timeout" and the default value is 1 day.

#### 3.1.3.5.2 Proposed Presentation Contexts

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

**Table 34:** SC SCU Presentation Contexts of SKY

| 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 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2   | SCP  | None                 |
|                               |                      | DICOM Explicit VR Big Endian Transfer Syntax,   | 1.2.840.10008.1.2.2 |      |                      |
|                               |                      | DICOM Explicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2.1 |      |                      |

#### 3.1.3.5.3 SOP Specific Conformance Statement

Storage Commitment is supported for all the SOP class UIDs as mentioned in tables 2 and 27. The Referenced Study Component Sequence is not supported.

### **3.1.4 Transfer Syntax Selection**

The Siemens SKY currently supports the Implicit Little Endian, Explicit Big Endian, Explicit Little Endian, JPEG Baseline(Process 1) Lossy, JPEG Extended (Process 2 und 4) Lossy, and JPEG Lossless Transfersyntaxes (detailed description see presentation context tables).

For Storage Service Class Provider, the Siemens SKY has following syntax priority Order:

- 1) JPEG Extended (Process 2 und 4) Lossy
- 2) JPEG Lossless, Non-Hierarchical (Process 14)
- 3) JPEG Baseline (Process 1) Lossy
- 4) Implicit Little Endian
- 5) Explicit Little Endian
- 6) Explicit Big Endian
- 7) RLE

The transfer syntax priority order for the Query/Retrieve Provider is:

- 1) Implicit VR Little Endian
- 2) Explicit VR Little Endian
- 3) Explicit VR Big Endian.

On Verification SOP Class:

- 1) Implicit Little Endian
- 2) Explicit Big Endian
- 3) Explicit Little Endian.

---

## 4 Communication Profiles

### 4.1 Supported Communication Stacks

Siemens SKY provides DICOM TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

#### 4.1.1 TCP/IP Stack

Siemens SKY uses the TCP/IP stack from the Windows 2000/XP system upon which it executes.

##### 4.1.1.1 Physical Media Support

Siemens SKY is independent of the physical medium over which TCP/IP executes.

# 5 Extensions/Privatizations/Specializations

## 5.1 Standard Extended/ Specialized/Private SOPs

### 5.1.1 Mitra Report Management SOP Class

#### 5.1.1.1 Real World Activity - Mitra Report Management

##### 5.1.1.1.1 Associated Real World Activity - Mitra Report Management

The SKY can request reports via DICOM C-Find.

##### 5.1.1.1.2 Presentation Context Table - Mitra Report Management

The SKY supports the presentation contexts listed in the following table

:

Table 35: Presentation Contexts

| Presentation Context Table     |                       |                                                 |                   |      |                                 |
|--------------------------------|-----------------------|-------------------------------------------------|-------------------|------|---------------------------------|
| Abstract Syntax                |                       | Transfer Syntax                                 |                   | Role | Extend<br>ed<br>Negotia<br>tion |
| Name                           | UID                   | Name List                                       | UID List          |      |                                 |
| Mitra Report Info Model - FIND | 1.2.840.113532.3500.8 | DICOM Implicit VR Little Endian Transfer Syntax | 1.2.840.10008.1.2 | SCU  | None                            |

**5.1.1.1.3 SOP Specific Conformance - Mitra Report Management**

The SKY provides conformance to a Mitra private SOP Class used to fetch report information. The SKY supports the following elements for this SOP Class. The SCP is supposed to include all supported attributes in its response, independent of which attributes are included in the query.

The SKY is able to use the Requested Procedure ID as matching key even if the SCP only supports it as return key.

*Table 36: Mitra Report Information Model Attributes*

| Message Field                        | Tag          | Matching Key Type SCU | Return Key Type SCU |
|--------------------------------------|--------------|-----------------------|---------------------|
| Accession Number                     | (0008, 0050) | Yes                   | Yes                 |
| Patient's Name                       | (0010, 0010) | Yes                   | Yes                 |
| Patient ID                           | (0010, 0020) | Yes                   | Yes                 |
| Patient's Birth Date                 | (0010, 0030) | Yes                   | Yes                 |
| Requested Procedure Description      | (0032, 1060) | No                    | Yes                 |
| Requested Procedure Code Sequence    | (0032, 1064) | No                    | Yes                 |
| >Code Value                          | (0008, 0100) | No                    | Yes                 |
| >Coding Scheme Designator            | (0008, 0102) | No                    | Yes                 |
| >Code Meaning                        | (0008, 0104) | No                    | Yes                 |
| Requested Procedure ID               | (0040, 1001) | Yes                   | Yes                 |
| Results ID Issuer                    | (4008, 0042) | No                    | Yes                 |
| Interpretation Approval Time         | (4008, 0013) | No                    | Yes                 |
| Physicians Approving Interpretation  | (4008, 0014) | No                    | Yes                 |
| Interpretation Recorded Date         | (4008, 0100) | No                    | Yes                 |
| Interpretation Recorded Time         | (4008, 0101) | No                    | Yes                 |
| Interpretation Recorder              | (4008, 0102) | No                    | Yes                 |
| Interpretation Transcriber           | (4008, 010A) | No                    | Yes                 |
| Interpretation Text                  | (4008, 010B) | No                    | Yes                 |
| Interpretation Author                | (4008, 010C) | No                    | Yes                 |
| Interpretation Approver Sequence     | (4008, 0111) | No                    | Yes                 |
| >Interpretation Approval Date        | (4008, 0112) | No                    | Yes                 |
| >Interpretation Approval Time        | (4008, 0113) | No                    | Yes                 |
| >Physician Approving Interpretation  | (4008, 0114) | No                    | Yes                 |
| Interpretation Diagnosis Description | (4008, 0115) | No                    | Yes                 |
| Interpretation ID                    | (4008, 0200) | No                    | Yes                 |
| Interpretation Status ID             | (4008, 0212) | No                    | Yes                 |

## **5.2 Private Transfer Syntaxes**

None.

## 6 Configuration

### 6.1 AE Title / Presentation Address Mapping

The Siemens SKY maps Application Entity Titles to host name and port number via an internal configuration method. The IP address for the host name is determined using standard system calls.

For each DICOM SKY **default** unique Application Entity Titles are assigned using the following mechanism:

Each Application Entity Title starts with "MV300\_" and has added the Serial Number, eg. "MV300\_0032" for SKY.

The AE Titles can be changed with the configuration, the Port No. for the Storage SCP and the Query/Retrieve SCP is 104.

### 6.2 Configurable Parameters

- o The Application Entity Titles, host names and port numbers.
- o PDU size is set to 16384
- o time-out for accepting/rejecting an association request: 300 sec
- o time-out for responding to an association open/close request: 300 sec
- o time-out for accepting a message over the network: 300 sec
  - All this Timeout values can be changed via Configuration
- o Number of max. accepted Query Matches
- o automatic request for Storage Commitment
- o Event Receipt Timeout
- o Media Burn Timeout
- o Enable Storage Commitment Provider (MV300 acts as a SC SCP only if this is enabled)

---

## **7 Support of Extended Character Sets**

The Siemens DICOM application supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

# Part II - Media Storage

## **8 Introduction**

### **8.1 Purpose**

This DICOM Conformance Statement is written according to part PS 3.2 of [2].

The applications described in this DICOM Conformance Statement are the SIEMENS SKY VA40A DICOM off-line media applications. The SKY DICOM off-line media storage service implementation acts as FSC, FSU and FSR for the specified application profiles and the related SOP Class instances.

### **8.2 Definitions, Abbreviations**

#### **8.2.1 Definitions**

DICOM Digital Imaging and Communications in Medicine

DIMSE DICOM Message Service Element

DIMSE-C DICOM Message Service Element with Composite information objects

#### **8.2.2 Abbreviations**

|       |                                                    |
|-------|----------------------------------------------------|
| ACR   | American College of Radiology                      |
| AE    | DICOM Application Entity                           |
| ASCII | American Standard Code for Information Interchange |
| DB    | Database                                           |
| DCS   | DICOM Conformance Statement                        |
| FSC   | File Set Creator                                   |
| FSR   | File Set Reader                                    |
| FSU   | File Set Updater                                   |
| IOD   | DICOM Information Object Definition                |
| ISO   | International Standard Organization                |
| R     | Required Key Attribute                             |
| NEMA  | National Electrical Manufacturers Association      |
| O     | Optional Key Attribute                             |
| PDU   | DICOM Protocol Data Unit                           |
| RWA   | Real-World Activity                                |
| U     | Unique Key Attribute                               |

### **8.3 References**

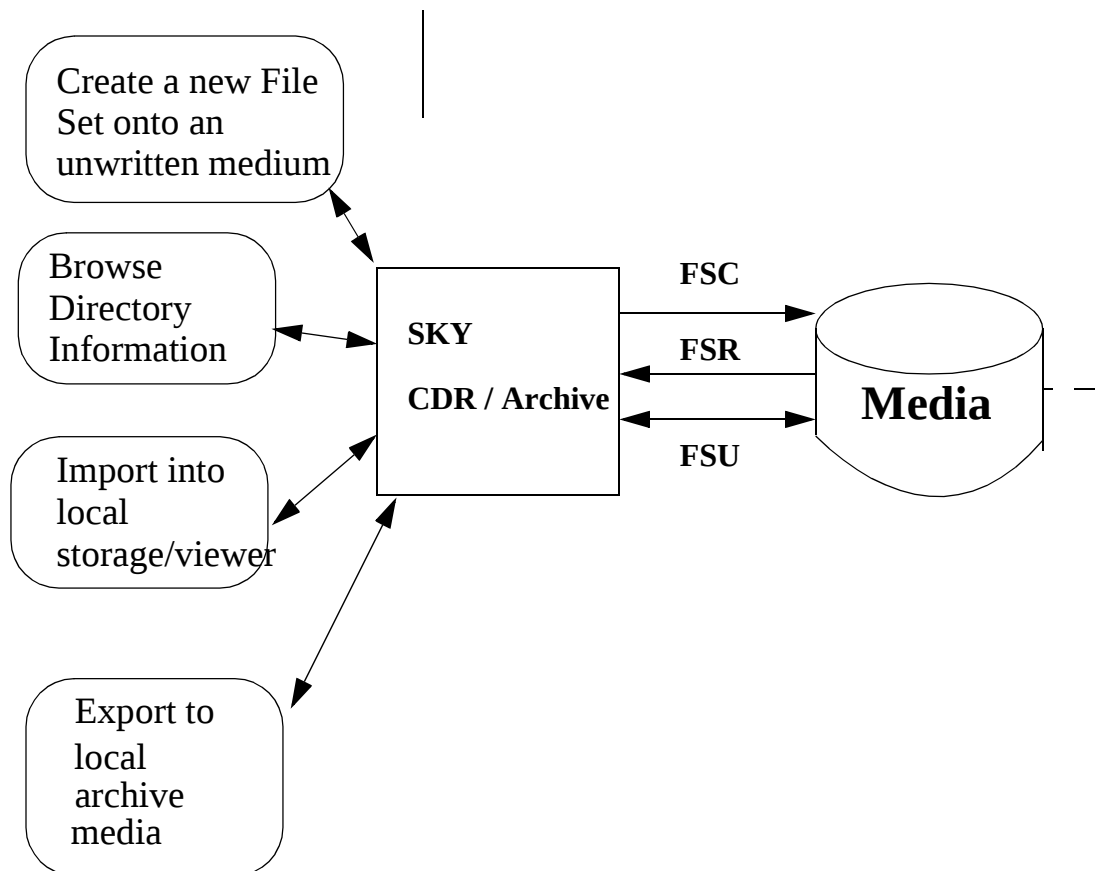
- [2] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-15

## 8.4 Connectivity and Interoperability

The implementation of the Siemens DICOM interface has been carefully tested to assure correspondence with this DICOM Conformance Statement. But the Conformance Statement and the DICOM standard does not guarantee interoperability of Siemens modalities and modalities of other vendors. The user must compare the relevant DICOM Conformance Statements and if a successful interconnection should be possible, the user is responsible to specify an appropriate test suite and to validate the interoperability, which is required. A network environment may need additional functions out of the scope of DICOM.

## 9 Implementation Model

### 9.1 Application Data Flow Diagram



The SKY CDR/Archive application will serve as an interface to the CD-R or DVD-RAM medium device. It serves interfaces to include the off-line media directory into the browser and to copy SOP instances to a medium or retrieve SOP Instances from medium into local storage.

The SKY CDR/Archive application will support CD-R and DVD-RAM media (see Table 37:).

The FSU role will update new SOP Instances only to media with pre-existing File-sets conforming to the Application Profiles supported.

The contents of the DICOMDIR will be temporarily stored in Archive-Database.

### 9.2 Functional definitions of Application Entities

The SKY VA40A DICOM off-line media storage application consists of the SKY CDR/Archive application entity serving all interfaces to access off-line media. The SKY CDR/Archive application is capable of creating a new File-set onto an unwritten medium.

updating an existing File-set by writing new SOP Instances onto the medium.

copying SOP Instances from the medium onto local storage or loading them into viewer

reading the File-set's DicomDIR information temporarily into database and pass it to display applications.

## 9.3 Sequencing of Real World Activities

The SKY CDR/Archive application will not perform updates before the Directory information of the DicomDIR is completely read.

## 9.4 File Meta Information Options

The Implementation Class UID is:

"1.3.12.2.1107.5.8.2"

and an Implementation Version Name of

SHS\_MV300\_VA42A.

# 10 Application Entity Specifications

## 10.1 SKY CDR/Archive Specification

The SKY CDR/Archive provides Standard conformance to Media Storage Service Class (Interchange Option).

*Table 37: Application profiles, Activities, and Roles for SKY CDR/Archive*

| Application Profiles Supported                                                                                      | Real World Activity           | Role    | SC Option   |
|---------------------------------------------------------------------------------------------------------------------|-------------------------------|---------|-------------|
| STD-GEN-CD<br>STD-GEN-DVD-RAM<br>STD-US-ID-MF-CD<br>STD-US-ID-MF-DVD-RAM<br>AUG-US-ID-MF-CD<br>AUG-US-ID-MF-DVD-RAM | Create new CD or DVD          | FSC     | Interchange |
|                                                                                                                     | Browse Directory Information  | FSR     | Interchange |
|                                                                                                                     | Import into local Storage     | FSR     | Interchange |
|                                                                                                                     | Export to local archive media | FSC,FSU | Interchange |

Configuration of uncompressed Transfer Syntax for export will result in compatibility to the STD-GEN-CD profile.

### 10.1.1 File Meta Information for the Application Entity

The Source Application Entity Title is "SKY".

### 10.1.2 Real-World Activities for this Application Entity

#### 10.1.2.1 Real-World Activity: Create new File Set onto an unwritten medium

The SKY CDR/Archive application acts as FSC using the interchange option when requested to initialize media.

The SKY CDR/Archive application will take the user provided list of SOP instances (which may be empty), and eliminate any SOP Instance on that list that does not correspond to one of the Application Profiles listed in Chapter 10.1.3 and Chapter 11. These SOP Instances are written onto the media and a corresponding DCOMDIR is created. The determination of the potentially applicable Application Profile is dependent on the type of media. This is determined by the drive and associated software on which the AE has been invoked.

##### 10.1.2.1.1 Application Profiles for the RWA: Create new File Set onto an unwritten medium

See Table 37: for the Application Profiles listed that invoke this Application Entity for the Create new File Set onto an unwritten medium Real World Activity.

### 10.1.2.2 Real-World Activity: Browse Directory Information

The SKY CDR/Archive application acts as FSR using the interchange option when requested to read the media directory.

The SKY CDR/Archive application will read the DICOMDIR and insert that directory entries, which are supported, into a local database. The database can then be used for browsing media contents.

#### 10.1.2.2.1 Application Profiles for the RWA: Browse Directory Information

See Table 37: for the Application Profiles listed that invoke this Application Entity for the Browse Directory Information Real World Activity.

### 10.1.2.3 Real-World Activity: Import into local Storage or Viewer

The SKY CDR/Archive application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the local storage or the viewer.

The SOP Instance selected from the media directory will be copied into the local storage or loaded into the viewer. Only SOP Instances, that are supported, can be retrieved from media storage.

#### 10.1.2.3.1 Application Profiles for the RWA: Import into local Storage or Viewer

See Table 37: for the Application Profiles listed that invoke this Application Entity for the Copy to Local Storage Real World Activity.

### 10.1.2.4 Real-World Activity: Export to local Archive Media

The SKY CDR/Archive application acts as FSU (for media with existing DICOM file-set) or FSC (media not initialized) using the interchange option when requested to copy SOP Instances from the local storage to local Archive medium.

The SKY CDR/Archive application will receive a list of SOP Instances to be copied to the local archive medium. According to the state of the medium inserted (new medium, Medium with DICOM file-set) the SOP Instances are either updated or created on the media. Only valid SOP Instances are accepted.

The SKY CDR/Archive application will not close the CD-R medium.

#### 10.1.2.4.1 Application Profiles for the RWA: Export to local Archive Media

See Table 37: for the Application Profiles listed that invoke this Application Entity for the Copy to local Archive Real World Activity.

## 10.1.3 Application profiles

### 10.1.3.1 STD-GEN-CD, STD-GEN-DVD-RAM

For media conforming to the STD-GEN-CD or STD-GEN-DVD-RAM Profile the following SOP classes will be supported as an FSR, FSC,FSU.

Transfer Syntax is always Explicit VR Little Endian Uncompressed.

Transfer Syntax UID is 1.2.840.10008.1.2.1

**Table 38:** STD-GEN Supported SOP Classes

| Information Object Definitions                     | SOP Class UID                 |
|----------------------------------------------------|-------------------------------|
| Basic Directory                                    | 1.2.840.10008.1.3.10          |
| CR Image                                           | 1.2.840.10008.5.1.4.1.1.1     |
| CT Image                                           | 1.2.840.10008.5.1.4.1.1.2     |
| MR Image                                           | 1.2.840.10008.5.1.4.1.1.4     |
| SC Image                                           | 1.2.840.10008.5.1.4.1.1.7     |
| XA Image                                           | 1.2.840.10008.5.1.4.1.1.12.1  |
| XRF-Image                                          | 1.2.840.10008.5.1.4.1.1.12.2  |
| NM Image                                           | 1.2.840.10008.5.1.4.1.1.20    |
| PET Image                                          | 1.2.840.10008.5.1.4.1.1.128   |
| RT Image                                           | 1.2.840.10008.5.1.4.1.1.481.1 |
| RT Dose                                            | 1.2.840.10008.5.1.4.1.1.481.2 |
| RT Plan                                            | 1.2.840.10008.5.1.4.1.1.481.5 |
| RT Structure Set                                   | 1.2.840.10008.5.1.4.1.1.481.3 |
| RT Beams Treatment Record                          | 1.2.840.10008.5.1.4.1.1.481.4 |
| RT Brachy Treatment Record                         | 1.2.840.10008.5.1.4.1.1.481.6 |
| RT Treatment Record                                | 1.2.840.10008.5.1.4.1.1.481.7 |
| US Image                                           | 1.2.840.10008.5.1.4.1.1.6.1   |
| US-MF image                                        | 1.2.840.10008.5.1.4.1.1.3.1   |
| US Image Storage retired                           | 1.2.840.10008.5.1.4.1.1.6     |
| US Multiframe Image Storage retired                | 1.2.840.10008.5.1.4.1.1.3     |
| Digital X-Ray Image - For Presentation             | 1.2.840.10008.5.1.4.1.1.1.1   |
| Digital Mammography X-Ray Image - For Presentation | 1.2.840.10008.5.1.4.1.1.1.2   |
| Digital Intra-Oral X-Ray Image - For Presentation  | 1.2.840.10008.5.1.4.1.1.1.3   |

| Information Object Definitions | SOP Class UID                  |
|--------------------------------|--------------------------------|
| Hardcopy Greyscale Image       | 1.2.840.10008.5.1.1.29         |
| Hardcopy Color Image           | 1.2.840.10008.5.1.1.30         |
| VL Endoscopic Image            | 1.2.840.10008.5.1.4.1.1.77.1.1 |
| VL Microscopic Image           | 1.2.840.10008.5.1.4.1.1.77.1.2 |
| VL Photographic Image          | 1.2.840.10008.5.1.4.1.1.77.1.4 |
| Basic Text SR                  | 1.2.840.10008.5.1.4.1.1.88.11  |
| Enhanced Text SR               | 1.2.840.10008.5.1.4.1.1.88.22  |
| Comprehensive SR               | 1.2.840.10008.5.1.4.1.1.88.33  |
| Mammography CAD SR             | 1.2.840.10008.5.1.4.1.1.88.50  |

### 10.1.3.2 STD-US-ID-MF-CDR, STD-US-ID-MF-DVD-RAM(Single- and multiframe)

For media conforming to the STD-US-ID-MF-CDR or STD-US-ID-MF-DVD-RAM Profile the following SOP classes and transfer syntaxes will be supported as an FSR, FSC,FSU

**Table 39: STD-US-ID-MF-xxx Supported SOP Classes**

| Information Object Definitions and SOP Class UID           | Transfer Syntax and UID                                       | FSC | FSR | FSU |
|------------------------------------------------------------|---------------------------------------------------------------|-----|-----|-----|
| Ultrasound Image<br>1.2.840.10008.5.1.4.1.1.6.1            | Explicit VR Little Endian Uncompressed<br>1.2.840.10008.1.2.1 | yes | yes | yes |
|                                                            | JPEG Baseline (Process 1)<br>1.2.840.10008.1.2.4.50           | no  | yes | no  |
|                                                            | RLE Lossless<br>1.2.840.10008.1.2.5                           | no  | yes | no  |
| Ultrasound Multiframe Image<br>1.2.840.10008.5.1.4.1.1.3.1 | Explicit VR Little Endian Uncompressed<br>1.2.840.10008.1.2.1 | yes | yes | yes |
|                                                            | JPEG Baseline (Process 1)<br>1.2.840.10008.1.2.4.50           | no  | yes | no  |
|                                                            | RLE Lossless<br>1.2.840.10008.1.2.5                           | no  | yes | no  |

All Photometric Interpretations are supported by FSR/FSC/FSU:

# 11 Augmented Profiles

## 11.1 Augmented Application Profiles

The Augmentation adds the Retired US Formats to the Standard US Application Profiles

**Table 40:** Augmented Application profiles, Activities, and Roles for SKY CDR/Archive

| Application Profiles Supported           | Real World Activity                 | Role    | SC Option   |
|------------------------------------------|-------------------------------------|---------|-------------|
| AUG-US-ID-MF-CDR<br>AUG-US-ID-MF-DVD-RAM | Create CDR or DVD-RAM               | FSC     | Interchange |
|                                          | Browse Directory Information        | FSR     | Interchange |
|                                          | Import into local Storage or Viewer | FSR     | Interchange |
|                                          | Export to local archive media       | FSC,FSU | Interchange |

### 11.1.1 AUG-US-ID-MF-CDR, AUG-US-ID-MF-DVD-RAM

For media conforming to the AUG-US-ID-MF-CDR or AUG-US-ID-MF-DVD-RAM Profile the following SOP classes will be supported as an FSR, FSC,FSU

**Table 41:** AUG-US-ID-MF-xxx Supported SOP Classes

| Information Object Definitions and SOP Class UID                 | Transfer Syntax and UID                                       | FSC | FSR | FSU |
|------------------------------------------------------------------|---------------------------------------------------------------|-----|-----|-----|
| US Image Storage retired<br>1.2.840.10008.5.1.4.1.1.6            | Explicit VR Little Endian Uncompressed<br>1.2.840.10008.1.2.1 | yes | yes | yes |
|                                                                  | JPEG Baseline (Process 1)<br>1.2.840.10008.1.2.4.50           | no  | yes | no  |
|                                                                  | RLE Lossless<br>1.2.840.10008.1.2.5                           | no  | yes | no  |
| US Multiframe Image Storage retired<br>1.2.840.10008.5.1.4.1.1.3 | Explicit VR Little Endian Uncompressed<br>1.2.840.10008.1.2.1 | yes | yes | yes |
|                                                                  | JPEG Baseline (Process 1)<br>1.2.840.10008.1.2.4.50           | no  | yes | no  |
|                                                                  | RLE Lossless<br>1.2.840.10008.1.2.5                           | no  | yes | no  |

# Appendix A: Requirements for Viewing of DICOM Images

## Scope

This section of the SKY DICOM Conformance Statement documents the required DICOM Tags for the Viewing application.

## Requirements for Display and Evaluation

- o Tags (0028,1050),(0028,1051) Window Center and Width and Tags (0028,1052),(0028,1053) Rescale Slope and Intercept must have values, which allow the image to be displayed on another station.
- o Following Pixel Representations are supported by the Viewer:

| Attribute Name       | DICOM Tag    | 16-bit unsigned | 16-bit signed | 15-bit | 14-bit | 13-bit | 12-bit | 10-bit | 8-bit | 8-bit |
|----------------------|--------------|-----------------|---------------|--------|--------|--------|--------|--------|-------|-------|
| Bits allocated       | (0028, 0100) | 16              | 16            | 16     | 16     | 16     | 16     | 16     | 16    | 8     |
| Bits stored          | (0028, 0101) | 16              | 16            | 15     | 14     | 13     | 12     | 10     | 8     | 8     |
| High bit             | (0028, 0102) | 15              | 15            | 14     | 13     | 12     | 11     | 9      | 7     | 7     |
| Pixel Representation | (0028,0103)  | 0               | 1             | 0      | 0      | 0      | 0      | 0      | 0     | 0     |

**Note:** If storing changed images, all 16-bit images are stored as 12 bit.

- o Following Photometric Interpretations are supported by the Viewer:

| Photometric Interpretation (0028,0004) | Planar Configuration (0028,0006) | Support Read | Support Store |
|----------------------------------------|----------------------------------|--------------|---------------|
| RGB                                    | 0                                | Y            | Y             |
| RGB                                    | 1                                | Y            | N             |
| MONOCHROME1                            | n.a.                             | Y            | Y             |
| MONOCHROME2                            | n.a.                             | Y            | Y             |
| PALETTE COLOR                          | n.a.                             | Y            | N             |
| YBR_FULL*                              | 1                                | Y            | N             |
| YBR_FULL_422*                          | 0                                | Y            | N             |
| YBR_PARTIAL_422*                       | 0                                | Y            | N             |

All color images other than Default (1. Line) are converted to Default at storage time.

\*YBR images will be converted into RGB images and stored as RGB images.

Maximum Image Size: 10000 Rows and 10000 Columns. Bigger images cannot be loaded to Viewer.

Maximum No. of Frames for Multiframe: 1000.

These are the requirements for Display and Evaluations of the Viewing station. The Storage of images do not follow the current restrictions.

**Requirements for Storage of Shutters**

On Storing if there was a Shutter (Circular or Rectangle) painted by the User, the Shutter Module is stored into the DICOM Object also if it is not official Part of the IOD. The according Tags are 0018,1600 up to 0018,1612.

## Appendix B: Restrictions for Viewing of DICOM Images

The following DICOM images can be archived by the SKY application, but cannot displayed at the viewer:

- RT Dose
- RT Plan
- RT Structure Set
- RT Beams Treatment Record
- RT Brachy Treatment Record
- RT Treatment Summary Record
- Basic Text SR
- Enhanced SR
- Comprehensive SR
- Mammography CAD SR
- Grayscale Softcopy Presentation State
- Key Object Selection

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