**TOSHIBA**

# DICOM CONFORMANCE STATEMENT

# FOR

# TOSHIBA DIGITAL RADIOGRAPHY SYSTEM

*Infinix Celeve-i series / Infinix-i series*

*Model DFP-8000 series*

*V4.25*

**TOSHIBA MEDICAL SYSTEMS CORPORATION**

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# 1. CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by DFP-8000 series. This corresponds since software version V4.25.

**Table 1-1**
**NETWORK SERVICES**

| SOP Classes | User of Service (SCU) | Provider of Service (SCP) |
|---|---|---|
| **Transfer** | | |
| XA Image Storage | Yes*[1] | Yes |
| X-Ray Radiation Dose SR | Yes*[2] | No |
| **Storage Commitment** | | |
| Storage Commitment Push Model | Yes*[1] | No |
| **Query/Retrieve** | | |
| Patient Root Q/R Information Model – Find | Yes*[1] | No |
| Patient Root Q/R Information Model – Move | Yes*[1] | No |
| **Workflow Management** | | |
| Modality Worklist Information Model – Find | Yes*[1] | No |
| Modality Performed Procedure Step | Yes*[1] | No |
| **Print Management** | | |
| Basic Grayscale Print Management | Yes | No |

*[1]:Option

*[2]:Option since software version V4.25

Table 1-2 provides an overview of the Media Storage Application Profiles supported by Infinix Celeve.

**Table 1-2**
**MEDIA SERVICES**

| Media Storage Application Profile | Write Files (FSC or FSU) | Read Files (FSR) |
|---|---|---|
| **Compact Disk – Recordable** | | |
| XA Image CD-R | Yes | Yes |
| General Purpose CD-R | Yes | Yes |
| **DVD** | | |
| XA Image DVD-R | Yes | Yes |
| General Purpose DVD-R | Yes | Yes |

**Table 1-3**
**SUPPORTED IODS, SOP CLASSES AND TRANSFER SYNTAXES**

| Information Object Definition | SOP Class UID | Transfer Syntax | Transfer Syntax UID |
|---|---|---|---|
| Media Storage Directory Storage | 1.2.840.10008.1.3.10 | Explicit VR Little Endian Uncompressed | 1.2.840.10008.1.2.1 |
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Explicit VR Little Endian Uncompressed | 1.2.840.10008.1.2.1 |
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Jpeg Lossless | 1.2.840.10008.1.2.4.70 |
| X-Ray Radiation Dose SR | 1.2.840.10008.5.1.4.1.1.88.67 | Explicit VR Little Endian Uncompressed | 1.2.840.10008.1.2.1 |

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# 3. INTRODUCTION

## 3.1 REVISON HISTORY

| Document Version | Date of Issue | Author | Description |
|---|---|---|---|
| J | October 25, 2012 | TMSC | Add software version in front cover<br>Update "Presence of Value" of Distance Source to Patient (0018,1111) |

## 3.2 AUDIENCE

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

## 3.3 REMARKS

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Toshiba Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:
— The comparison of different conformance statements is the first step towards assessing interconnectivity between Toshiba Medical Systems and non- Toshiba Medical Systems equipment.
— Test procedures should be defined to validate the desired level of connectivity.
— The DICOM standard will evolve to meet the users' future requirements. Toshiba Medical Systems is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

## 3.4 DEFINITIONS, TERMS AND ABBREVIATIONS

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.

Abbreviations and terms are as follows:

| | |
|---|---|
| **AE** | Application Entity |
| **AET** | Application Entity Title |
| **ASCE** | Association Control Service Element |
| **CD-R** | Compact Disk Recordable |
| **DIMSE** | DICOM Message Service Element |
| **DVD** | A trademark of the DVD forum that is not an abbreviation |
| **DVD-R** | DVD Recordable |
| **FSC** | File-Set Creator |
| **FSU** | File-Set Updater |
| **FSR** | File-Set Reader |
| **IE** | Information Entity |
| **IOD** | Information Object Definition |
| **MPPS** | Modality Performed Procedure Step |
| **MSPS** | Modality Scheduled Procedure Step |
| **MWM** | Modality Worklist Management |
| **R** | Required Key Attribute |
| **O** | Optional Key Attribute |
| **PDU** | Protocol Data Unit |
| **SCU** | Service Class User (DICOM client) |
| **SCP** | Service Class Provider (DICOM server) |
| **SOP** | Service-Object Pair |
| **U** | Unique Key Attribute |
| **UID** | Unique Identifier |

## 3.5 REFERENCES

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.16, 2009

# 4. NETWORKING

## 4.1 IMPLEMENTATION MODEL

### 4.1.1 Application Data Flow
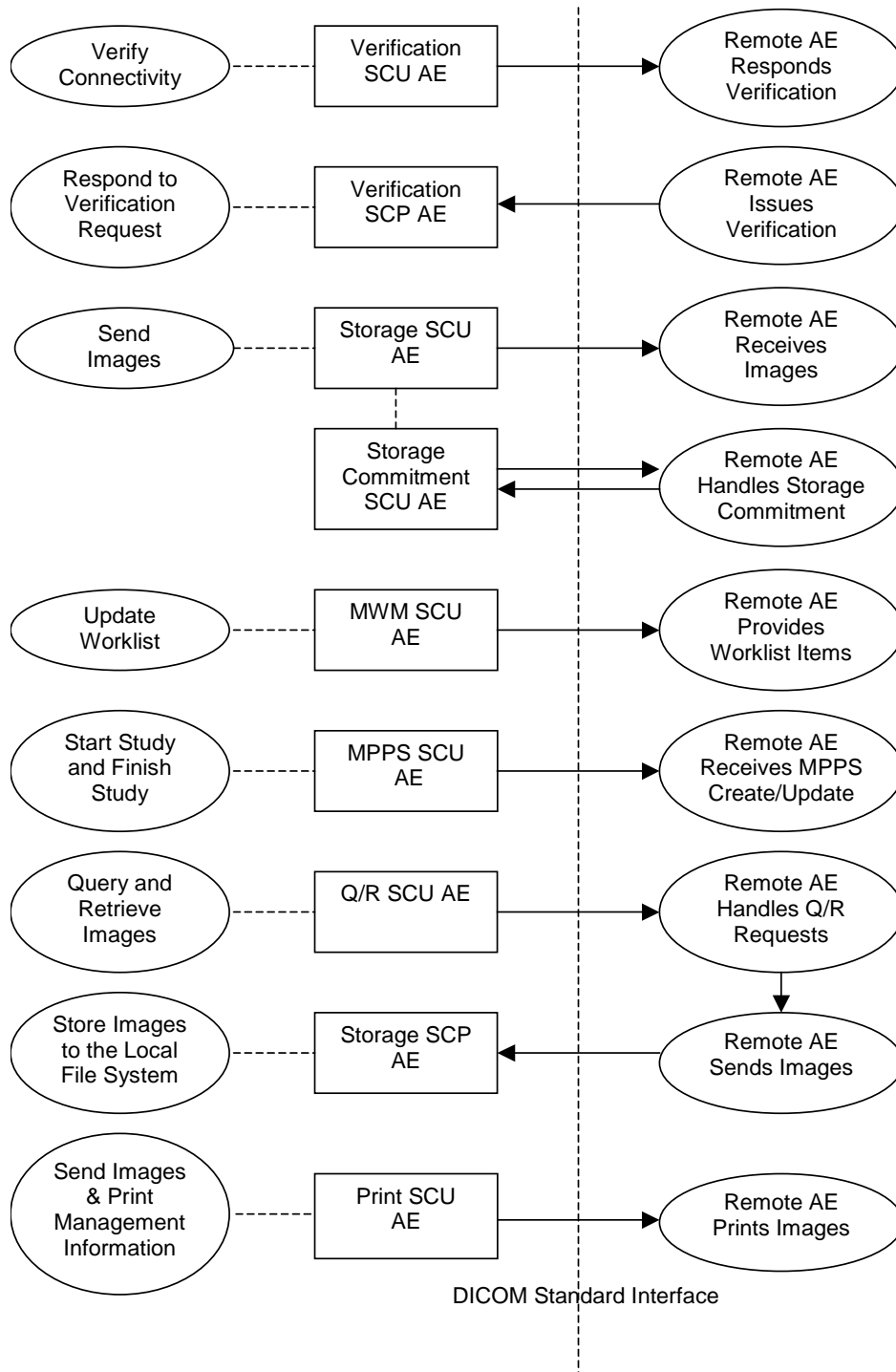


**Figure 4.1-1**
**APPLICATION DATA FLOW DIAGRAM**

— The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is associated with the local real-world activity "Verify Connectivity". "Verify Connectivity" is performed via the Service Tool.

— The Verification SCP AE responds successfully to C-ECHO requests from known AE Titles. It is associated with the local real-world activity "Respond to Verification Request"

— The Storage SCU AE sends images to a remote AE. It is associated with the local real-world activity "Send Images". "Send Images" is performed upon user request for specific images selected.
If the remote AE is configured as a Storage Commitment SCP AE, the Storage SCU AE will send a storage commitment request to the Storage Commitment SCP AE.

— Receiving the storage commitment request from the Storage SCU AE, the Storage Commitment SCU AE will request Storage Commitment and if a commitment is successfully obtained will record this information in the local database.

— The MWM SCU AE receives Worklist information from a remote AE. It is associated with the local real-world activity "Update Worklist". When the "Update Worklist" is performed the MWM SCU AE queries a remote AE for worklist items and provides the set of worklist items matching the query request. "Update Worklist" is performed as a result of an operator request and an automatic request.

— The MPPS SCU AE sends MPPS information to a remote AE. It is associated with the local real-world activity "Acquire Instances". When the "Acquire Instances" is performed the MPPS SCU AE creates and updates Modality Performed Procedure Step instances managed by a remote AE. Acquisition of images will result in automated creation of an MPPS Instance. Completion of the MPPS is performed as the result of an operator action.

— The Q/R SCU AE queries a remote AE for lists of patients, studies, series and images and retrieves selected patients, studies, series or images. It is associated with the local real-world activity "Query and Retrieve Images".

— The Storage SCP AE receives incoming images. It is associated with the local real-world activity "Store Images to the Local File System". "Store Images to the Local File System" stores the received images to the local file system.

— The Print SCU AE prints images on a remote AE (Printer). It is associated with the local real-world activity "Send Images & Print Management Information". "Send Images & Print Management Information" creates a print-job within the print queue containing one or more virtual film sheets composed from images selected by the user.

### 4.1.2  Functional Definition of AEs

#### 4.1.2.1    Functional Definition of Verification SCU AE

The Verification SCU AE issues a C-ECHO to verify a DICOM connection to a remote AE. It is performed via the Service Tool and the local real-world activity "Send Images". Before sending images, the Verification SCU AE can be issue a C-ECHO to verify a DICOM connection to a remote AE with "ping" function.

#### 4.1.2.2    Functional Definition of Verification SCP AE

The Verification SCP AE responds successfully to C-ECHO requests from known AE Titles, port numbers.

#### 4.1.2.3    Functional Definition of Storage SCU AE

The existence of a send-job queue entry with associated network destination will activate the Storage SCU AE. An Association request is sent to the destination AE and upon successful negotiation of a Presentation Context the image transfer is started. If the image transfer fails, the Storage SCU AE will not retry this send-job automatically. If the remote AE is configured as an archive device, the storage SCU AE will send a storage commitment request to the Storage Commitment SCU AE. The Storage SCU AE can also issue C-ECHO requests as a Verification SCU before the image transfer independently.

#### 4.1.2.4    Functional Definition of Storage Commitment SCU AE

Receiving the storage commitment request from the Storage SCU AE, the Storage Commitment SCU AE will request Storage Commitment and if a commitment is successfully obtained will record this information in the local database.

#### 4.1.2.5    Functional Definition of MWM SCU AE

The MWM SCU AE attempts to download a worklist from a remote node. If the MWM SCU AE establishes an Association to a remote AE, it will transfer patient's information and worklist items via the open Association. The results will be displayed in a separate list. The patient's information will be used for the patient registration.

#### 4.1.2.6    Functional Definition of MPPS SCU AE

The MPPS SCU AE performs the creation of an MPPS instance automatically when a study started. Further updates on the MPPS data can be performed automatically or interactively after finish study.

#### 4.1.2.7    Functional Definition of Q/R SCU AE

The Q/R SCU AE is activated when the user selects a remote node to query and enters some key information, Patient's Name, Patient ID, Study Date, Study Time and Modality. The user can select patient, studies, series and images to be retrieved. The images will be received at the Storage SCP AE.

#### 4.1.2.8    Functional Definition of Storage SCP AE

The Storage SCP AE waits for another application to connect at the presentation address configured for its AE Title. The Storage SCP AE will accept associations with Presentation Contexts for SOP Classes of the Storage Service Classes. Any images received on such Presentation Contexts will be stored to the local file system.

#### 4.1.2.9    Functional Definition of Print AE

The existence of a print-job in the print queue will activate the Print SCU AE. An association is established with the printer and the printer's status determined. If the printer is operating normally, the film sheets described within the print-job will be printed. If the printer is not operating normally, this print-job can be canceled or restarted by the user operations.

## 4.1.3  Sequencing of Real-World Activities
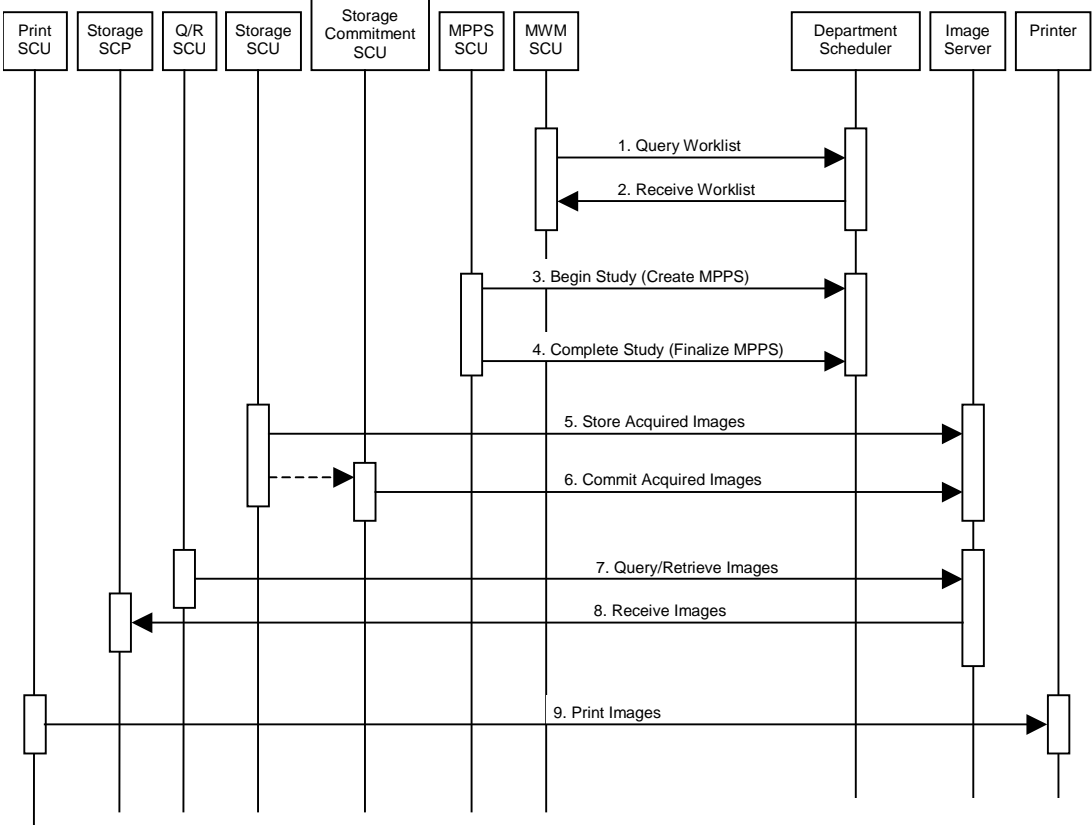


**Figure 4.1-2**
**SEQUENCING CONSTRAINTS**

Under typical scheduled workflow conditions the sequencing constraints illustrated in Figure 4.1-2 apply:

1. Query Worklist.

2. Select Workitem from Worklist.

3. Start Acquisition and Create MPPS.

4. Complete Acquisition and Finalize MPPS.

5. Store Acquired Images.

6. Commit Acquired Images.

7. Query/Retrieve Images.

8. Receive Images.

9. Print Images.

Other workflow situations (e.g. unscheduled procedure steps) will have other sequencing constraints. Some activities may be omitted according to situations.

## 4.2    AE SPECIFICATIONS

### 4.2.1  Verification SCU AE Specification

#### 4.2.1.1    SOP Classes

The Verification SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-1**
**SOP CLASSES FOR THE VERIFICATION SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Verification | 1.2.840.10008.1.1 | Yes | Yes |

#### 4.2.1.2    Association Policies

##### 4.2.1.2.1    General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-2**
**DICOM APPLICATION CONTEXT FOR THE VERIFICATION SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

##### 4.2.1.2.2  Number of Associations

The Verification SCU AE initiates one association at a time.

**Table 4.2-3**
**NUMBER OF ASSOCIATIONS INITIATED FOR THE VERIFICATION SCU AE**

| Maximum number of simultaneous associations | 1 |
|---|---|

##### 4.2.1.2.3    Asynchronous Nature

The Verification SCU AE does not support asynchronous communication (multiple outstanding transactions over a single association).

**Table 4.2-4**
**ASYNCHRONOUS NATURE FOR THE VERIFICATION SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

##### 4.2.1.2.4    Implementation Identifying Information

The implementation information for the Verification SCU AE is:

**Table 4.2-5**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE VERIFICATION SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.1.3    Association Initiation Policy

#### 4.2.1.3.1        Activity – Verify Connectivity

##### 4.2.1.3.1.1    Description and Sequencing of Activities

The Verification SCU AE attempts to initiate a new association in order to issue a verification request (C-ECHO) if needed.
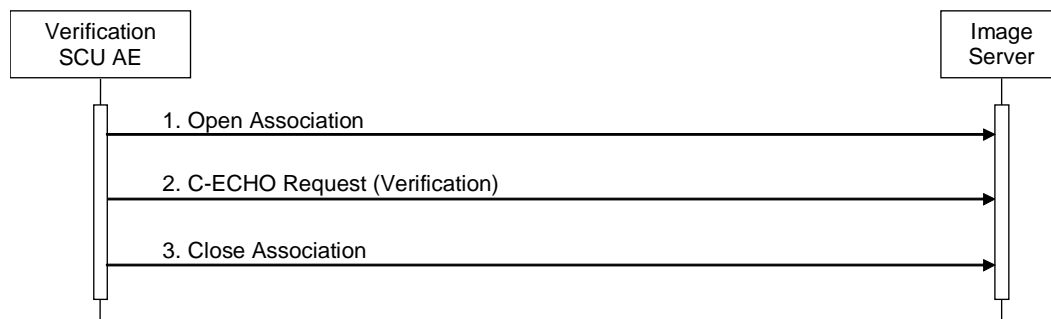


**Figure 4.2-1**
**SEQUENCING OF ACTIVITY – VERIFY CONNECTIVITY**

A possible sequence of interactions between the Verification SCU AE and an Image Server (e.g. a storage or archive device supporting the Verification SOP Classes as an SCP) is illustrated in the Figure above:

1.  The Verification SCU AE opens an association with the Image Server.

2.  The Verification SCU AE issues a verification request (C-ECHO) and the Image Server replies with a C-ECHO response (status success).

3.  The Verification SCU AE closes the association with the Image Server.

##### 4.2.1.3.1.2    Proposed Presentation Contexts

The Verification SCU AE will propose the Presentation Contexts shown in the following table:

**Table 4.2-6**
**PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY VERIFY CONNECTIVITY**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Ext. Neg.** |
| **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 Little Endian | 1.2.840.10008.1.2.1 | | |

### 4.2.1.3.1.3  SOP Specific Conformance for Verification SOP Class

The Verification SCU AE provides standard conformance to the Verification Service Class as an SCU.

The behavior of Verification SCU AE when encountering status codes in a C-ECHO response is summarized in the table below:

**Table 4.2-7**
**VERIFICATION RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The Verification SCU AE judges the remote AE is present and active on the network. |

The behavior of Verification SCU AE during communication failure is summarized in the table below:

**Table 4.2-8**
**VERIFICATION COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The association is aborted and the failure reason is logged and reported to the user. |
| Association aborted by the SCP or network layers | The failure reason is logged and reported to the user. |

## 4.2.2　Verification SCP AE Specification

### 4.2.2.1　SOP Classes

The Verification SCP AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-9**
**SOP CLASSES FOR THE VERIFICATION SCP AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Verification | 1.2.840.10008.1.1 | No | Yes |

### 4.2.2.2　Association Policies

#### 4.2.2.2.1　General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-10**
**DICOM APPLICATION CONTEXT FOR THE VERIFICATION SCP AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

#### 4.2.2.2.2　Number of Associations

**Table 4.2-11**
**NUMBER OF ASSOCIATIONS ACCEPTED FOR THE VERIFICATION SCP AE**

| Maximum number of simultaneous associations | Unlimited |
|---|---|

#### 4.2.2.2.3　Asynchronous Nature

The Verification SCP AE does not support asynchronous communication (multiple outstanding transactions over a single association).

**Table 4.2-12**
**ASYNCHRONOUS NATURE FOR THE VERIFICATION SCP AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

#### 4.2.2.2.4　Implementation Identifying Information

The implementation information for the Verification SCP AE is:

**Table 4.2-13**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE VERIFICATION SCP AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.2.3    Association Initiation Policy

The Verification SCP AE does not initiate associations.

### 4.2.2.4    Association Acceptance Policy

#### 4.2.2.4.1        Activity – Respond to Verification Request

##### 4.2.2.4.1.1      Description and Sequencing of Activities

When the Verification SCP AE accepts an association, it will respond to a verification request (C-ECHO).
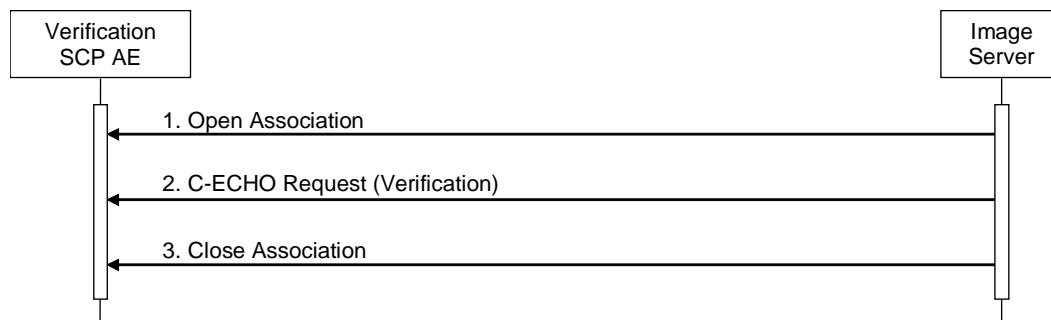


**Figure 4.2-2**
**SEQUENCING OF ACTIVITY – RESPOND TO VERIFICATION REQUEST**

A possible sequence of interactions between the Verification SCP AE and an Image Server (e.g. a storage or archive device supporting the Verification SOP Classes as an SCU) is illustrated in the Figure above:

1.  The Image Server opens an association with the Verification SCP AE.

2.  The Image Server issues a verification request (C-ECHO) and the Verification SCP AE replies with a C-ECHO response (status success).

3.  The Image Server closes the association with the Verification SCP AE.

The Verification SCP AE may reject association attempts as shown in the table below. The Result, Source and Reason/Diag columns represent the values returned in the appropriate fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The contents of the Source column is abbreviated to save space and the meaning of the abbreviations are:

**Table 4.2-14**
**ASSOCIATION REJECTION REASONS**

| Result | Source | Reason/Diag | Explanation |
|---|---|---|---|
| 1 – rejected-permanent | DICOM UL service-user | 3 – calling-AE-title-not-recognized | The association request contained an unrecognized calling AE Title. An association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the association acceptor has not been configured to recognize the AE Title of the association initiator. |
| 1 – rejected-permanent | DICOM UL service-provider (ASCE related function) | 1 – no-reason-given | The association request could not be parsed. An association request with the same format will not succeed at a later time. |

#### 4.2.2.4.1.2    Accepted Presentation Contexts

The default behavior of the Verification SCP AE supports the Implicit VR Little Endian and Explicit VR Little Endian transfer syntaxes. If the both transfer syntaxes are proposed per presentation context then the Verification SCP AE will select Explicit VR Little Endian transfer syntax.

**Table 4.2-15**
**PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY RESPOND TO VERIFICATION REQUEST**

| Presentation Context Table | | | | | |
| --- | --- | --- | --- | --- | --- |
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name List | UID List | | |
| Verification | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

#### 4.2.2.4.1.3    SOP Specific Conformance for Verification SOP Class

The Verification SCP AE provides standard conformance to the Verification Service Class as an SCP.

### 4.2.3 Storage SCU AE Specification

### 4.2.3.1 SOP Classes

The Storage SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-16**
**SOP CLASSES FOR THE STORAGE SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Yes | Yes |
| X-Ray Radiation Dose SR | 1.2.840.10008.5.1.4.1.1.88.67 | Yes | No |

### 4.2.3.2 Association Policies

### 4.2.3.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-17**
**DICOM APPLICATION CONTEXT FOR THE STORAGE SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

### 4.2.3.2.2 Number of Associations

The Storage SCU AE can initiate only one association at a time for each destination to which a transfer request is being processed in the active job queue list. Up to two jobs, that images will be sent to the different remote hosts, will be active at a time, the other remains pending until the active job is completed or failed.

**Table 4.2-18**
**NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

### 4.2.3.2.3 Asynchronous Nature

The Storage SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-19**
**ASYNCHRONOUS NATURE FOR THE STORAGE SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

### 4.2.3.2.4 Implementation Identifying Information

The implementation information for the Storage SCU AE is:

**Table 4.2-20**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.3.3 Association Initiation Policy

### 4.2.3.3.1 Activity – Send Images

#### 4.2.3.3.1.1    Description and Sequencing of Activities

The Storage SCU AE attempts to initiate a new Association in order to issue a Storage request (C-STORE). If the job contains multiple images then single C-STORE requests will be issued over the separate Association. If the image transfer fails, the Storage SCU AE will not retry this send-job automatically.

The Storage SCU AE also attempts to initiate a new Association in order to issue a ping (ICMP) request and Verification request (C-ECHO) if needed.
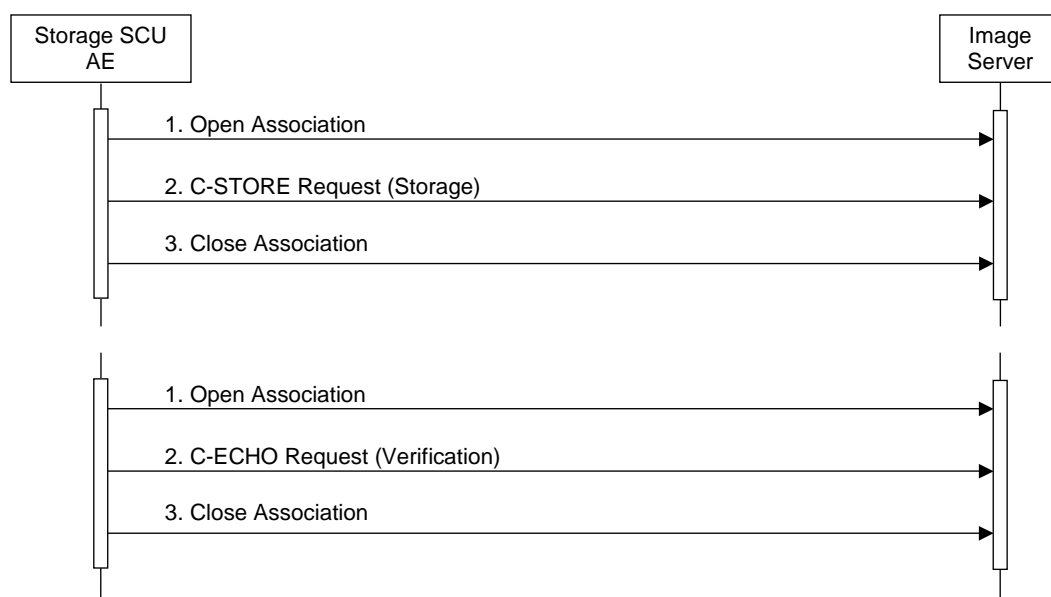


**Figure 4.2-3**
**SEQUENCING OF ACTIVITY – SEND IMAGES**

A possible sequence of interactions between the Storage SCU AE and an Image Server (e.g. a storage or archive device supporting the Storage SOP Classes as an SCP) is illustrated in the Figure above:

1.  The Storage SCU AE opens an Association with the Image Server.

2.  Acquired images are transmitted to the Image Server using a Storage request (C-STORE) and the Image Server replies with a C-STORE response (status success).

3.  The Storage SCU AE closes the Association with the Image Server.

#### 4.2.3.3.1.2 Proposed Presentation Contexts

The Storage SCU AE is capable of proposing the Presentation Contexts shown in the following table:

**Table 4.2-21**
**PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY SEND IMAGES**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name List | UID List | | |
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |
| | | JPEG Lossless (Process 14[Section Value1]) | 1.2. 840.10008.1.2.4.70 | | |
| X-Ray Radiation Dose SR | 1.2.840.10008.5.1.4.1.1.88.67 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCU | None |
| | | Explicit VR Little Endian | 1.2.840.10008.1.2.1 | | |

#### 4.2.3.3.1.3 SOP Specific Conformance for Verification SOP Class

The Storage SCU AE provides standard conformance to the Verification Service Class as an SCU. It is initiated by manual operation.

The behavior of Storage SCU AE when encountering status codes in a C-ECHO response is summarized in the Table below:

**Table 4.2-22**
**VERIFICATION C-ECHO RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The Storage SCU AE judges the remote AE is present and active on the network. |

The behavior of Storage SCU AE during communication failure is summarized in the Table below:

**Table 4.2-23**
**VERIFICATION COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |

#### 4.2.3.3.1.4 SOP Specific Conformance for Storage SOP Classes

The Storage SCU AE provides standard conformance to the Storage Service Class as an SCU.

The behavior of Storage SCU AE when encountering status codes in a C-STORE response is summarized in the Table below:

**Table 4.2-24**
**STORAGE C-STORE RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has successfully stored the SOP Instance. If all SOP Instances in a send job have status success then the job is marked as complete. |
| Refused | Out of Resources | A7xxH | The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. This is a transient failure. |
| Error | Data Set does not match SOP Class | A9xxH | The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| Error | Cannot Understand | CxxxH | The Association is aborted using A-ABORT and the send job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| Warning | Coercion of Data Elements | B000H | Image transmission is considered successful if it is configured that the status would be considered successful. |
| Warning | Data Set does not match SOP Class | B007H | Image transmission is considered successful if it is configured that the status would be considered successful. |
| Warning | Elements Discarded | B006H | Image transmission is considered successful if it is configured that the status would be considered successful. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the send job is marked as failed. The status code is logged and the job failure is reported to the user via the job control application. |

The behavior of Storage SCU AE during communication failure is summarized in the Table below:

**Table 4.2-25**
**STORAGE COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |

If the image transfer fails, the Storage SCU AE will not retry this send-job automatically.

The contents of Image Storage SOP Instances created by the Storage SCU AE conform to the DICOM Image IOD definitions and are described in section 8.1.

### 4.2.4  Storage Commitment SCU AE Specification

### 4.2.4.1  SOP Classes

The Storage Commitment SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-26**
**SOP CLASSES FOR THE STORAGE COMMITMENT SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | Yes | No |

### 4.2.4.2  Association Policies

### 4.2.4.2.1  General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-27**
**DICOM APPLICATION CONTEXT FOR THE STORAGE COMMITMENT SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

### 4.2.4.2.2  Number of Associations

The Storage Commitment SCU AE initiates one Association at a time.

**Table 4.2-28**
**NUMBER OF ASSOCIATIONS INITIATED FOR THE STORAGE COMMITMENT SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

The Storage Commitment SCU AE accepts Associations to receive N-EVENT-REPORT notifications for the Storage Commitment Push Model SOP Class.

**Table 4.2-29**
**NUMBER OF ASSOCIATIONS ACCEPTED FOR THE STORAGE COMMITMENT SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

### 4.2.4.2.3  Asynchronous Nature

The Storage Commitment SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-30**
**ASYNCHRONOUS NATURE FOR THE STORAGE COMMITMENT SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

### 4.2.4.2.4  Implementation Identifying Information

The implementation information for the Storage Commitment SCU AE is:

**Table 4.2-31**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE COMMITMENT SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.4.3    Association Initiation Policy

#### 4.2.4.3.1    Activity – Commit Sent Images

##### 4.2.4.3.1.1    Description and Sequencing of Activities

If the remote AE is configured as a Storage Commitment SCP AE, the Storage Commitment SCU AE will transmit a single Storage Commitment request (N-ACTION) over another Association after each image have been sent. Upon receiving the N-ACTION response the Storage Commitment SCU AE will release the Association. The notification of Storage commitment (N-EVENT-REPORT) will be received over a separate Association.
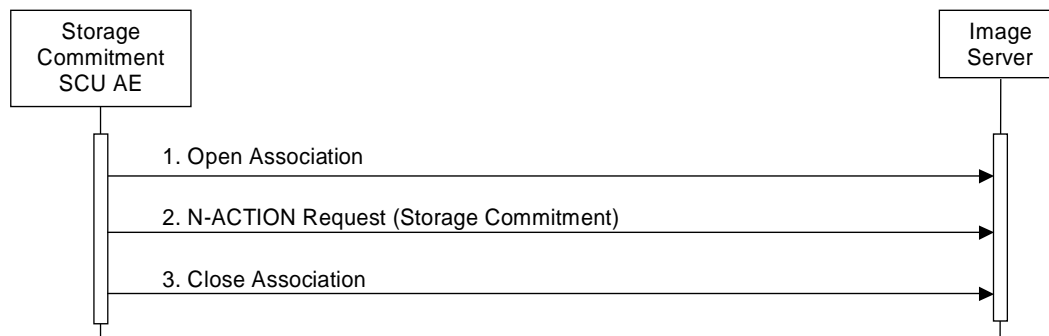


**Figure 4.2-4**
**SEQUENCING OF ACTIVITY – COMMIT SENT IMAGES**

A possible sequence of interactions between the Storage Commitment SCU AE and an Image Server (e.g. a storage or archive device supporting the Storage Commitment SOP Classes as an SCP) is illustrated in the Figure above:

1.  The Storage Commitment SCU AE opens an Association with the Image Server.

2.  A Storage Commitment request (N-ACTION) is transmitted to the Image Server to obtain Storage Commitment of previously transmitted image. The Image Server replies with an N-ACTION response indicating the request has been received and is being processed.

3.  The Storage Commitment AE closes the Association with the Image Server.

NOTE:    The N-EVENT-REPORT will be sent over a separate Association initiated by the Image Server (see Section 4.2.4.4.1).

#### 4.2.4.3.1.2    Proposed Presentation Contexts

The Storage Commitment SCU AE is capable of proposing the Presentation Contexts shown in the following table:

**Table 4.2-32**
**PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY COMMIT SENT IMAGES**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Ext. Neg.** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | Implicit VR Little Endian Explicit VR Little Endian | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 | SCU | None |

A Presentation Context for the Storage Commitment Push Model will only be proposed if the remote AE is configured as a Storage Commitment SCP AE.

### 4.2.4.3.1.3    SOP Specific Conformance for Storage Commitment SOP Class

### 4.2.4.3.1.3.1    Storage Commitment Operations (N-ACTION)

The Storage Commitment SCU AE provides standard conformance to the Storage Commitment Service Class as an SCU.

The Storage Commitment SCU AE will request storage commitment for instances of the Storage SOP Classes if the remote AE is configured as a Storage Commitment SCP AE and a presentation context for the Storage Commitment Push Model has been accepted.

The behavior of Storage SCU Commitment AE when encountering status codes in a N-ACTION response is summarized in the Table below:

**Table 4.2-33**
**STORAGE COMMITMENT N-ACTION RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The request for storage commitment is considered successfully sent. A timer is started which will expire if no N-EVENT-REPORT for the Transaction UID is received within a configurable timeout period. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the request for storage commitment is marked as failed. |

The behavior of Storage Commitment AE during communication failure is summarized in the Table below:

**Table 4.2-34**
**STORAGE COMMITMENT COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The send job is marked as failed. The reason is logged and the job failure is reported to the user via the job control application. |

## 4.2.4.4    Association Acceptance Policy

### 4.2.4.4.1        Activity – Receive Storage Commitment Response

#### 4.2.4.4.1.1        Description and Sequencing of Activities

The Storage Commitment SCU AE will accept Associations in order to receive responses to a Storage Commitment Request.
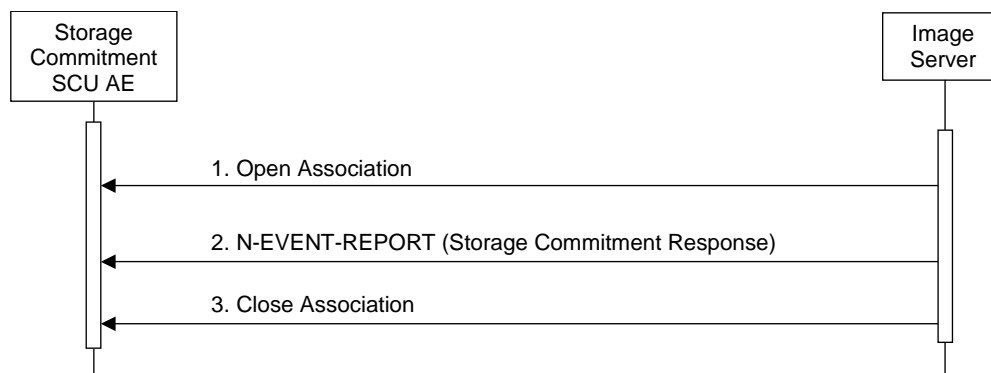


**Figure 4.2-5**
**SEQUENCING OF ACTIVITY - RECEIVE STORAGE COMMITMENT RESPONSE**

A possible sequence of interactions between the Storage Commitment SCU AE and an Image Server (e.g. a storage or archive device supporting Storage Commitment SOP Classes as an SCP) is illustrated in the Figure above:

1. The Image Server opens a new Association with the Storage Commitment SCU AE.

2. The Image Server sends an N-EVENT-REPORT request notifying the Storage SCU AE of the status of a previous Storage Commitment Request. The Storage SCU AE replies with a N-EVENT-REPORT response confirming receipt.

3. The Image Server closes the Association with the Storage Commitment SCU AE.

The Storage Commitment SCU AE may reject Association attempts as shown in the Table below.   The Result, Source and Reason/Diag columns represent the values returned in the appropriate fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4). The contents of the Source column is abbreviated to save space and the meaning of the abbreviations are:

a)   1 – DICOM UL service-user

b)   2 – DICOM UL service-provider (ASCE related function)

c)   3 – DICOM UL service-provider (Presentation related function)

**Table 4.2-35**
**ASSOCIATION REJECTION REASONS**

| Result | Source | Reason/Diag | Explanation |
|---|---|---|---|
| 2 – rejected-transient | c | 2 – local-limit-exceeded | The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time. |

| 2 – rejected-transient | c | 1 – temporary-congestion | No Associations can be accepted at this time due to the real-time requirements of higher priority activities (e.g. during image acquisition no Associations will be accepted) or because insufficient resources are available (e.g. memory, processes, threads). An Association request with the same parameters may succeed at a later time. |
|---|---|---|---|
| 1 – rejected-permanent | a | 2 – application-context-name-not-supported | The Association request contained an unsupported Application Context Name. An Association request with the same parameters will not succeed at a later time. |
| 1 – rejected-permanent | a | 7 – called-AE-title-not-recognized | The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title. |
| 1 – rejected-permanent | a | 3 – calling-AE-title-not-recognized | The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator. |
| 1 – rejected-permanent | b | 1 – no-reason-given | The Association request could not be parsed. An Association request with the same format will not succeed at a later time. |

#### 4.2.4.4.1.2 Accepted Presentation Contexts

The Storage Commitment SCU AE will accept Presentation Contexts as shown in the Table below.

**Table 4.2-36**
**ACCEPTABLE PRESENTATION CONTEXTS FOR**
**ACTIVITY RECEIVE STORAGE COMMITMENT RESPONSE**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | | Ext. |
| Name | UID | Name List | UID List | Role | Neg. |
| Storage Commitment Push Model | 1.2.840.10008.1.20.1 | Implicit VR Little Endian Explicit VR Little Endian | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 | SCU | None |

A Presentation Context for the Storage Commitment Push Model will only be proposed if the remote AE is configured as a Storage Commitment SCP AE.

#### 4.2.4.4.1.3 SOP Specific Conformance for Storage Commitment SOP Class

#### 4.2.4.4.1.3.1 Storage Commitment Notifications (N-EVENT-REPORT)

The Storage Commitment SCU AE provides standard conformance to the Storage Commitment Service Class as an SCU.

The behavior of Storage Commitment SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below.

**Table 4.2-37**
**STORAGE COMMITMENT N-EVENT-REPORT BEHAVIOUR**

| Event Type Name | Event Type ID | Behavior |
|---|---|---|
| Storage Commitment Request Successful | 1 | The Storage Commitment SCU AE permits the operator(s) to delete the Referenced SOP Instances under Referenced SOP Sequence (0018,1199), or deletes the Instances from the local database automatically. |
| Storage Commitment Request Complete – Failures Exist | 2 | The Storage Commitment SCU AE requests the Storage SCU AE to send the Referenced SOP Instances under Failed SOP Sequence (0018,1198). |

The reasons for returning specific status codes in a N-EVENT-REPORT response are summarized in the Table below.

**Table 4.2-38**
**STORAGE COMMITMENT N-EVENT-REPORT RESPONSE STATUS REASONS**

| Service Status | Further Meaning | Status Code | Reasons |
|---|---|---|---|
| Success | Success | 0000 | The storage commitment result has been successfully received. |
| Failure | Unrecognized Operation | 0211H | The Transaction UID in the N-EVENT-REPORT request is not recognized (was never issued within an N-ACTION request). |
| Failure | Resource Limitation | 0213H | The Transaction UID in the N-EVENT-REPORT request has expired (no N-EVENT-REPORT was received within a configurable time limit). |
| Failure | No Such Event Type | 0113H | An invalid Event Type ID was supplied in the N-EVENT-REPORT request. |
| Failure | Processing Failure | 0110H | An internal error occurred during processing of the N-EVENT-REPORT. A short description of the error will be returned in Error Comment (0000,0902). |
| Failure | Invalid Argument Value | 0115H | One or more SOP Instance UIDs with the Referenced SOP Sequence (0008,1199) or Failed SOP Sequence (0008,1198) was not included in the Storage Commitment Request associated with this Transaction UID. The unrecognized SOP Instance UIDs will be returned within the Event Information of the N-EVENT-REPORT response. |

### 4.2.5  MWM SCU AE Specification

### 4.2.5.1  SOP Classes

The MWM SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-39**
**SOP CLASSES FOR THE MWM SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Modality Worklist Information Model – FIND | 1.2.840.10008.5.1.4.31 | Yes | No |

### 4.2.5.2  Association Policies

### 4.2.5.2.1  General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-40**
**DICOM APPLICATION CONTEXT FOR THE MWM SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

### 4.2.5.2.2  Number of Associations

The MWM SCU AE initiates one Association at a time for a Worklist request.

**Table 4.2-41**
**NUMBER OF ASSOCIATIONS INITIATED FOR THE MWM SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

### 4.2.5.2.3  Asynchronous Nature

The MWM SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-42**
**ASYNCHRONOUS NATURE FOR THE MWM SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

### 4.2.5.2.4  Implementation Identifying Information

The implementation information for this Application Entity is:

**Table 4.2-43**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MWM SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.5.3    Association Initiation Policy

#### 4.2.5.3.1    Activity – Update Worklist

##### 4.2.5.3.1.1    Description and Sequencing of Activities

The request for a "Update Worklist" is initiated by user interaction, i.e. pressing the buttons "Refresh" or automatically at the time of previous "Update Worklist".

Upon initiation of the request, the MWM SCU AE will build an Identifier for the C-FIND request, will initiate an association to send the request and will wait for Worklist responses. After retrieval of all responses, the MWM SCU AE will access the local database to update patient demographic data. The results will be displayed in a separate list.

The MWM SCU AE will initiate an Association in order to issue a C-FIND request according to the Modality Worklist Information Model.
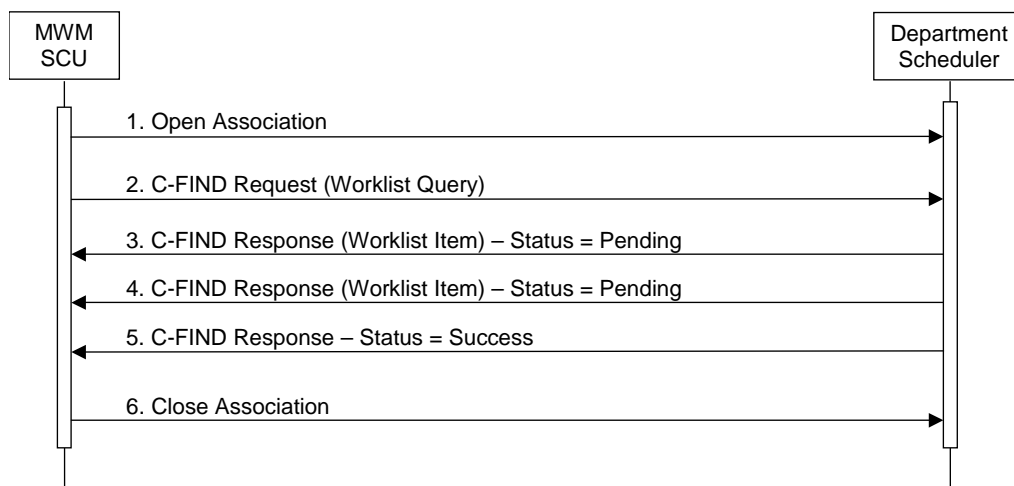


**Figure 4.2-6**
**SEQUENCING OF ACTIVITY – UPDATE WORKLIST**

A possible sequence of interactions between the MWM SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the Modality Worklist SOP Class as an SCP) is illustrated in the Figure above:

1. The MWM SCU AE opens an association with the Department Scheduler

2. The MWM SCU AE sends a C-FIND request to the Department Scheduler containing the Worklist Query attributes.

3. The Department Scheduler returns a C-FIND response containing the requested attributes of the first matching Worklist Item.

4. The Department Scheduler returns another C-FIND response containing the requested attributes of the second matching Worklist Item.

5. The Department Scheduler returns another C-FIND response with status Success indicating that no further matching Worklist Items exist. This example assumes that only 2 Worklist items match the Worklist Query.

6. The MWM SCU AE closes the association with the Department Scheduler.

### 4.2.5.3.1.2 Proposed Presentation Contexts

The MWM SCU AE will propose Presentation Contexts as shown in the following table:

**Table 4.2-44**
**Proposed Presentation Contexts for Activity Update Worklist**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name List | UID List | | |
| Modality Worklist Information Model – FIND | 1.2.840.10008.5.1.4.31 | Implicit VR Little Endian Explicit VR Little Endian | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 | SCU | None |

### 4.2.5.3.1.3    SOP Specific Conformance for Modality Worklist SOP Class

The MWM SCU AE provides standard conformance to the Modality Worklist SOP Class as an SCU.

The behavior of the MWM SCU when encountering status codes in a Modality Worklist C-FIND response is summarized in the Table below.

**Table 4.2-45**
**Modality Worklist C-FIND Response Status Handling Behavior**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Matching is complete | 0000 | The SCP has completed the matches. Worklist items are available for display or further processing. |
| Refused | Out of Resources | A700H | The Association is aborted using A-ABORT and the worklist query is marked as failed.   The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |
| Failed | Identifier does not match SOP Class | A900H | The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |
| Failed | Unable to Process | CxxxH | The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |
| Cancel | Matching terminated due to Cancel request | FE00H | If the query was cancelled due to too may worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. Otherwise, the Association is aborted using A-ABORT and the worklist query is marked as failed.   The status meaning is logged and reported to the user if an interactive query. |
| Pending | Matches are continuing | FF00H | The worklist item contained in the Identifier is collected for later display or further processing. |
| Pending | Matches are continuing – Warning that one or more Optional Keys were not supported | FF01H | The worklist item contained in the Identifier is collected for later display or further processing. The status meaning is logged only once for each C-FIND operation. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the worklist is marked as failed.   The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |

The behavior of the MWM SCU AE during communication failure is summarized in the Table below.

**Table 4.2-46**
**MODALITY WORKLIST COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the worklist query is marked as failed. The reason is logged and reported to the user if an interactive query. |
| Association aborted by the SCP or network layers | The worklist query is marked as failed. The reason is logged and reported to the user if an interactive query. |

The Table below provides a description of the MWM SCU AE Worklist Request Identifier and specifies the attributes that are copied into the images. Unexpected attributes returned in a C-FIND response are ignored.

**Table 4.2-47**
**WORKLIST REQUEST IDENTIFIER**

| Module Name<br>Attribute Name | Tag | VR | M | R | D | IOD |
|---|---|---|---|---|---|---|
| **SOP Common** | | | | | | |
| Specific Character Set | (0008,0005) | CS | | x | | x |
| **Scheduled Procedure Step** | | | | | | |
| Scheduled Procedure Step Sequence | (0040,0100) | SQ | | x | x | |
| > Scheduled Station AE Title | (0040,0001) | AE | S | x | | |
| > Scheduled Station Name | (0040,0010) | LO | | x | | |
| > Scheduled Procedure Step Location | (0040,0011) | SH | | x | x | |
| > Scheduled Procedure Step Start Date | (0040,0002) | DA | S, R | x | x | |
| > Scheduled Procedure Step Start Time | (0040,0003) | TM | | x | x | |
| > Scheduled Procedure Step End Date | (0040,0004) | DA | | x | | |
| > Scheduled Procedure Step End Time | (0040,0005) | TM | | x | | |
| > Scheduled Performing Physician's Name | (0040,0006) | PN | S, x | x | x | |
| > Scheduled Procedure Step Description | (0040,0007) | SH | | x | x | x |
| > Scheduled Protocol Code Sequence | (0040,0008) | SQ | | x | | x |
| > > Code Value | (0008,0100) | SH | | x | | |
| > > Coding Scheme Designator | (0008,0102) | SH | | x | | |
| > > Coding Scheme Version | (0008,0103) | SH | | x | | |
| > > Code Meaning | (0008,0104) | LO | | x | | |
| > Scheduled Procedure Step ID | (0040,0009) | SH | | x | x | x |
| > Scheduled Procedure Step Status | (0040,0020) | CS | | x | | |
| > Comments on Scheduled Procedure Step | (0040,0400) | LT | | x | | |
| > Modality | (0008,0060) | CS | S | x | x | x |
| > Requested Contrast Agent | (0032,1070) | LO | | x | | x |
| > Pre-Medication | (0040,0012) | LO | | x | | |
| **Requested Procedure** | | | | | | |

| Requested Procedure ID | (0040,1001) | SH | x | x | x | x |
|---|---|---|---|---|---|---|
| Reason for the Requested Procedure | (0040,1002) | LO | | x | | |
| Requested Procedure Comments | (0040,1400) | LT | | x | x | |
| Requested Procedure Code Sequence | (0032,1064) | SQ | | x | | |
| > Code Value | (0008,0100) | SH | | x | | |
| > Coding Scheme Designator | (0008,0102) | SH | | x | | |
| > Coding Scheme Version | (0008,0103) | SH | | x | | |
| > Code Meaning | (0008,0104) | LO | | x | | |
| Referenced Study Sequence | (0008,1110) | SQ | | x | | |
| > Referenced SOP Class UID | (0008,1150) | UI | | x | | |
| > Referenced SOP Instance UID | (0008,1155) | UI | | x | | |
| Requested Procedure Description | (0032,1060) | LO | | x | x | |
| Study Instance UID | (0020,000D) | UI | | x | | x |
| Requested Procedure Priority | (0040,1003) | SH | | x | x | |
| Patient Transport Arrangements | (0040,1004) | LO | | x | | |
| Requested Procedure Location | (0040,1005) | LO | | x | | |
| Confidentiality Code | (0040,1008) | LO | | x | | |
| Reporting Priority | (0040,1009) | SH | | x | | |
| Names of Intended Recipients of Results | (0040,1010) | PN | | x | x | |
| **Imaging Service Request** | | | | | | |
| Reason for the Imaging Service Request | (0040,2001) | LO | | x | | |
| Imaging Service Request Comments | (0040,2400) | LT | | x | | |
| Requesting Physician | (0032,1032) | PN | | x | x | |
| Referring Physician's Name | (0008,0090) | PN | | x | x | x |
| Requesting Service | (0032,1033) | LO | | x | x | x |
| Accession Number | (0008,0050) | SH | x | x | x | x |
| Issue Date of Imaging Service Request | (0040,2004) | DA | | x | | |
| Issue Time of Imaging Service Request | (0040,2005) | TM | | x | | |
| Order Entered By | (0040,2008) | PN | | x | | |
| Order Enters Location | (0040,2009) | SH | | x | | |
| Order Callback Phone Number | (0040,2010) | SH | | x | | |
| Placer Order Number / Imaging Service Request | (0040,2016) | LO | | x | | |
| Filter Order Number / Imaging Service Request | (0040,2017) | LO | | x | | |
| **Visit Relationship** | | | | | | |
| Referenced Patient Sequence | (0008,1120) | SQ | | x | | |
| > Referenced SOP Class UID | (0008,1150) | UI | | x | | |
| > Referenced SOP Instance UID | (0008,1155) | UI | | x | | |
| **Visit Identification** | | | | | | |
| Institution Name | (0008,0080) | LO | | x | | |
| Institution Address | (0008,0081) | ST | | x | | |
| Institution Code Sequence | (0008,0082) | SQ | | x | | |
| > Code Value | (0008,0100) | SH | | x | | |
| > Coding Scheme Designator | (0008,0102) | SH | | x | | |
| > Coding Scheme Version | (0008,0103) | SH | | x | | |
| > Code Meaning | (0008,0104) | LO | | x | | |
| Admission ID | (0038,0010) | LO | | x | | |
| Issuer of Admission ID | (0038,0011) | LO | | x | | |
| **Visit Status** | | | | | | |
| Visit Status ID | (0038,0008) | CS | | | | |
| Current Patient Location | (0038,0300) | LO | | x | x | |
| Patient's Institution Residence | (0038,0400) | LO | | | | |
| Visit Comments | (0038,4000) | LT | | | | |
| **Visit Admission** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Referring Physician's Address | (0008,0092) | ST | | x | | |
| Referring Physician's Telephone Number | (0008,0094) | SH | | x | | |
| Admitting Diagnosis Description | (0008,1080) | LO | | x | x | |
| Admitting Diagnosis Code Sequence | (0008,1084) | SQ | | x | | |
| > Code Value | (0008,0100) | SH | | x | | |
| > Coding Scheme Designator | (0008,0102) | SH | | x | | |
| > Coding Scheme Version | (0008,0103) | SH | | x | | |
| > Code Meaning | (0008,0104) | LO | | x | | |
| Route of Admissions | (0038,0016) | LO | | x | | |
| Admitting Date | (0038,0020) | DA | | x | | |
| Admitting Time | (0038,0021) | TM | | x | | |

**Patient Relationship**

| | | | | | | |
|---|---|---|---|---|---|---|
| Referenced Patient Alias Sequence | (0038,0004) | SQ | | x | | |
| > Referenced SOP Class UID | (0008,1150) | UI | | x | | |
| > Referenced SOP Instance UID | (0008,1155) | UI | | x | | |

**Patient Identification**

| | | | | | | |
|---|---|---|---|---|---|---|
| Patient's Name | (0010,0010) | PN | x | x | x | x |
| Patient ID | (0010,0020) | LO | x | x | x | x |
| Issuer of Patient ID | (0010,0021) | LO | | x | | |
| Other Patient IDs | (0010,1000) | LO | | x | x | x |
| Other Patient Names | (0010,1001) | PN | | x | x | x |
| Patient's Birth Name | (0010,1005) | PN | | x | | x |
| Patient's Mother's Birth Name | (0010,1060) | PN | | x | | x |
| Medical Record Locator | (0010,1090) | LO | | x | | |

**Patient Demographic**

| | | | | | | |
|---|---|---|---|---|---|---|
| Patient's Age | (0010,1010) | AS | | x | x | x |
| Occupation | (0010,2180) | SH | | x | x | |
| Patient Data Confidentiality Constraint Description | (0040,3001) | LO | | x | | |
| Patient's Birth Date | (0010,0030) | DA | | x | x | x |
| Patient's Birth Time | (0010,0032) | TM | | x | | |
| Patient's Sex | (0010,0040) | CS | | x | x | x |
| Patient's Insurance Plan Code Sequence | (0010,0050) | SQ | | x | | |
| > Code Value | (0008,0100) | SH | | x | | |
| > Coding Scheme Designator | (0008,0102) | SH | | x | | |
| > Coding Scheme Version | (0008,0103) | SH | | x | | |
| > Code Meaning | (0008,0104) | LO | | x | | |
| Patient's Size | (0010,1020) | DS | | x | x | x |
| Patient's Weight | (0010,1030) | DS | | x | x | x |
| Patient's Address | (0010,1040) | LO | | x | | x |
| Military Rank | (0010,1080) | LO | | x | | |
| Branch of Service | (0010,1081) | LO | | x | | |
| Country Residence | (0010,2150) | LO | | x | | |
| Region of Residence | (0010,2152) | LO | | x | | |
| Patient's Telephone Number | (0010,2154) | SH | | x | | |
| Ethnic Group | (0010,2160) | SH | | x | x | |
| Patient's Religious Reference | (0010,21F0) | LO | | x | | |
| Patient Comment | (0010,4000) | LT | | x | x | x |

**Patient Medical**

| | | | | | | |
|---|---|---|---|---|---|---|
| Medical Alerts | (0010,2000) | LO | | x | x | |
| Contrast Allergies | (0010,2110) | LO | | x | x | x |
| Smoking Status | (0010,21A0) | CS | | x | | x |
| Additional Patient History | (0010,21B0) | LT | | x | x | |
| Pregnancy Status | (0010,21C0) | US | | x | x | x |
| Last Menstrual Date | (0010,21D0) | DA | | x | | |
| Special Needs | (0038,0050) | LO | | x | | |
| Patient State | (0038,0500) | LO | | x | | |

The above table should be read as follows:

| | |
|---|---|
| Module Name: | The name of the associated module for supported worklist attributes. |
| Attribute Name: | Attributes supported to build the MWM SCU AE Worklist Request Identifier. |
| Tag: | DICOM tag for this attribute. |
| VR: | DICOM VR for this attribute. |
| M: | Matching keys for (automatic) Worklist Update. An "S" will indicate that the MWM SCU AE will supply an attribute value for Single Value Matching, a "R" will indicates Range Matching and an "x" will indicates Wildcard Matching. This setting can be selected the device user interface. The system's default setting is described in the above table. |
| R: | Return keys. An "x" will indicate that the MWM SCU AE will supply this attribute as Return Key with zero length for Universal Matching. This setting can be configured using the service tool. The system's default setting is described in the above table. |
| D: | Displayed keys. An "x" indicates that this worklist attribute is displayed to the user during a patient registration dialog. For example, Patient Name will be displayed when registering the patient prior to an examination. This setting can be configured using the service tool. The system's default setting is described in the above table. |
| IOD: | An "x" indicates that this Worklist attribute is included into all Object Instances created during performance of the related Procedure Step. This setting can be configured using the service tool. The system's default setting is described in the above table. |

## 4.2.5.4   Association Acceptance Policy

The MWM SCU AE does not accept Associations.

### 4.2.6  MPPS SCU AE Specification

### 4.2.6.1  SOP Classes

The MPPS SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-48**
**SOP CLASSES FOR THE MPPS SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 | Yes | No |
| Modality Performed Procedure Step Retrieve | 1.2.840.10008.3.1.2.3.4 | Yes | No |

### 4.2.6.2  Association Policies

### 4.2.6.2.1  General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-49**
**DICOM APPLICATION CONTEXT FOR THE MPPS SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

### 4.2.6.2.2  Number of Associations

The MPPS SCU AE initiates one Association at a time.

**Table 4.2-50**
**NUMBER OF ASSOCIATIONS INITIATED FOR THE MPPS SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

### 4.2.6.2.3  Asynchronous Nature

The MPPS SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-51**
**ASYNCHRONOUS NATURE FOR THE MPPS SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

### 4.2.6.2.4  Implementation Identifying Information

The implementation information for this Application Entity is:

**Table 4.2-52**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE MPPS SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.6.3    Association Initiation Policy

#### 4.2.6.3.1    Activity – Acquire Instances

##### 4.2.6.3.1.1    Description and Sequencing of Activities

The MPPS SCU AE performs the creation of a MPPS Instance automatically when the user starts the study. Further updates on the MPPS data can be performed when the user completes the study.

The MPPS SCU AE will initiate an Association to issue an:

— N-CREATE request according to the CREATE Modality Performed Procedure Step SOP Instance operation, or an:
— N-SET request to update the contents and state of the MPPS according to the SET Modality Performed Procedure Step Information operation.
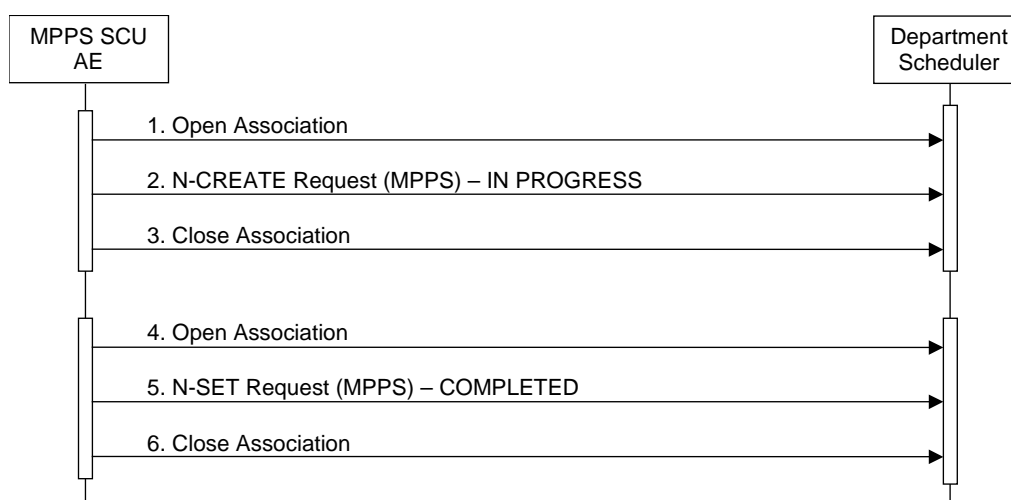


**Figure 4.2-7**
**SEQUENCING OF ACTIVITY – ACQUIRE INSTANCES**

A possible sequence of interactions between the MPPS SCU AE and a Department Scheduler (e.g. a device such as a RIS or HIS which supports the MPPS SOP Class as an SCP) is illustrated in the Figure above:

1. The MPPS SCU AE opens an association with the Department Scheduler

2. The MPPS SCU AE sends an N-CREATE request to the Department Scheduler to create an MPPS instance with status of "IN PROGRESS" and create all necessary attributes. The Department Scheduler acknowledges the MPPS creation with an N-CREATE response (status success).

3. The MPPS SCU AE closes the association with the Department Scheduler.

4. The MPPS SCU AE opens an association with the Department Scheduler.

5. The MPPS SCU AE sends an N-SET request to the Department Scheduler to update the MPPS instance with status of "COMPLETED" or "DISCONTINUED" and set all necessary attributes. The Department Scheduler acknowledges the MPPS update with an N-SET response (status success).

6. The MPPS SCU AE closes the association with the Department Scheduler.

### 4.2.6.3.1.2 Proposed Presentation Contexts

The MPPS SCU AE will propose Presentation Contexts as shown in the following Table:

**Table 4.2-53**
**PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY ACQUIRE IMAGES**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| **Abstract Syntax** | | **Transfer Syntax** | | **Role** | **Ext. Neg.** |
| **Name** | **UID** | **Name List** | **UID List** | | |
| Modality Performed Procedure Step | 1.2.840.10008.3.1.2.3.3 | Implicit VR Little Endian<br>Explicit VR Little Endian | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.1 | SCU | None |
| Modality Performed Procedure Step Retrieve | 1.2.840.10008.3.1.2.3.4 | Implicit VR Little Endian<br>Explicit VR Little Endian | 1.2.840.10008.1.2<br>1.2.840.10008.1.2.1 | SCU | None |

### 4.2.6.3.1.3 SOP Specific Conformance for MPPS SOP Class

The MPPS SCU AE provides standard conformance to the Modality Performed Procedure Step SOP Class as an SCU.

The behavior of the MPPS SCU AE when encountering status codes in an MPPS N-CREATE or N–SET response is summarized in the Table below.

**Table 4.2-54**
**MPPS N-CREATE / N-SET RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| Failure | Processing Failure – Performed Procedure Step Object may no longer be updated | 0110H | The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user. Additional information in the Response will be logged (i.e. Error Comment and Error ID). |
| Warning | Attribute Value Out of Range | 0116H | The MPPS operation is considered successful if it is configured that the status would be considered successful. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user. |

The behavior of the MPPS SCU AE during communication failure is summarized in the Table below:

**Table 4.2-55**
**MPPS COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and MPPS is marked as failed. The reason is logged and reported to the user. |
| Association aborted by the SCP or network layers | The MPPS is marked as failed. The reason is logged and reported to the user. |

Acquired images will always use the Study Instance UID specified for the Scheduled Procedure Step (if available). If an acquisition is unscheduled, a Study Instance UID will be generated locally.

The Table below provides a description of the MPPS N-CREATE and N-SET request identifiers sent by the MPPS SCU AE. Empty cells in the N-CREATE and N-SET columns indicate that the attribute is not sent.   An "x" indicates that an appropriate value will be sent. A "Zero length" attribute will be sent with zero length.

**Table 4.2-56**
**MPPS N-CREATE / N-SET REQUEST IDENTIFIER**

| Attribute Name | Tag | VR | N-CREATE | N-SET |
|---|---|---|---|---|
| Specific Character Set | (0008,0005) | CS | Created, if an extended or replacement character set is used. Refer to 6.SUPPORT OF CHARACTER SETS | |
| **Performed Procedure Step Relationship** | | | | |
| Scheduled Step Attributes Sequence | (0040,0270) | SQ | Always Set | |
| > Study Instance UID | (0020,000D) | UI | From Modality Worklist | |
| > Referenced Study Sequence | (0008,1110) | SQ | From Modality Worklist | |
| >> Referenced SOP Class UID | (0008,1150) | UI | From Modality Worklist | |
| >> Referenced SOP Instance UID | (0008,1155) | UI | From Modality Worklist | |
| > Accession Number | (0008,0050) | SH | From Modality Worklist | |
| > Placer Order Number/Imaging Service Request | (0040,2016) | LO | From Modality Worklist | |
| > Filler Order Number/Imaging Service Request | (0040,2017) | LO | From Modality Worklist | |
| > Requested Procedure ID | (0040,1001) | SH | From Modality Worklist | |
| > Requested Procedure Description | (0032,1060) | LO | From Modality Worklist | |
| > Scheduled Procedure Step ID | (0040,0009) | SH | From Modality Worklist | |
| > Scheduled Procedure Step Description | (0040,0007) | LO | From Modality Worklist | |
| > Scheduled Protocol Code Sequence | (0040,0008) | SQ | From Modality Worklist | |
| >>Code Value | (0008,0100) | SH | From Modality Worklist | |
| >>Coding Scheme Designator | (0008,0102) | SH | From Modality Worklist | |
| >>Coding Scheme Version | (0008,0103) | SH | From Modality Worklist | |
| >>Code Meaning | (0008,0104) | LO | From Modality Worklist | |
| Patient's Name | (0010,0010) | PN | From Modality Worklist or user input | |
| Patient ID | (0010,0020) | LO | From Modality Worklist or user input. | |
| Patient's Birth Date | (0010,0030) | DA | From Modality Worklist or user input. | |
| Patient's Sex | (0010,0040) | CS | From Modality Worklist or user input. | |
| Referenced Patient Sequence | (0008,1120) | SQ | From Modality Worklist. | |
| >Referenced SOP Class UID | (0008,1150) | UI | From Modality Worklist | |
| >Referenced SOP Instance UID | (0008,1155) | UI | From Modality Worklist | |
| **Performed Procedure Step Information** | | | | |
| Performed Procedure Step ID | (0040,0253) | SH | Automatically created. | |

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| Performed Station AE Title | (0040,0241) | AE | MPPS AE Title | |
|---|---|---|---|---|
| Performed Station Name | (0040,0242) | SH | From configuration | |
| Performed Location | (0040,0243) | SH | From configuration | |
| Performed Procedure Step Start Date | (0040,0244) | DA | Actual start date | |
| Performed Procedure Step Start Time | (0040,0245) | TM | Actual start time | |
| Performed Procedure Step Status | (0040,0252) | CS | IN PROGRESS | COMPLETED or DISCONTINUED |
| Performed Procedure Step Description | (0040,0254) | LO | From Modality Worklist. | |
| Performed Procedure Type Description | (0040,0255) | LO | From Modality Worklist. | |
| Procedure Code Sequence | (0008,1032) | SQ | Zero or more items | Zero or more items |
| >>Code Value | (0008,0100) | SH | | |
| >>Coding Scheme Designator | (0008,0102) | SH | | |
| >>Coding Scheme Version | (0008,0103) | SH | | |
| >>Code Meaning | (0008,0104) | LO | | |
| Performed Procedure Step End Date | (0040,0250) | DA | Zero length | Actual end date |
| Performed Procedure Step End Time | (0040,0251) | TM | Zero length | Actual end time |
| Comments on the Performed Procedure Steps | (0040,0280) | ST | Zero length | x |
| **Image Acquisition Results** | | | | |
| Modality | (0008,0060) | CS | XA | |
| Study ID | (0020,0010) | SH | From Modality Worklist or automatically created. | |
| Performed Protocol Code Sequence | (0040,0260) | SQ | Zero or more items | Zero or more items |
| >>Code Value | (0008,0100) | SH | | x |
| >>Coding Scheme Designator | (0008,0102) | SH | | x |
| >>Coding Scheme Version | (0008,0103) | SH | | x |
| >>Code Meaning | (0008,0104) | LO | | x |
| Performed Series Sequence | (0040,0340) | SQ | Zero length | One or more items |
| > Performing Physician's Name | (0008,1050) | PN | | x |
| > Protocol Name | (0018,1030) | LO | | x |
| > Operator's Name | (0008,1070) | PN | | x |
| > Series Instance UID | (0020,000E) | UI | | x |
| > Series Description | (0008,103E) | LO | | x |
| > Retrieve AE Title | (0008,0054) | AE | | x |
| > Referenced Image Sequence | (0008,1140) | SQ | | One or more items |
| >> Referenced SOP Class UID | (0008,1150) | UI | | x |
| >> Referenced SOP Instance UID | (0008,1155) | UI | | x |

| | | | | |
|---|---|---|---|---|
| > Referenced Non-Image Composite SOP Instance Sequence | (0040,0220) | SQ | | One or more items |
| >> Referenced SOP Class UID | (0008,1150) | UI | | x |
| >> Referenced SOP Instance UID | (0008,1155) | UI | | x |
| **Radiation Dose** | | | | |
| Total Time of Fluoroscopy | (0040,0300) | US | | x |
| Total Number of Exposures | (0040,0301) | US | | x |
| Entrance Dose | (0040,0302) | US | | x |
| Entrance Dose in mGy | (0040,8302) | DS | | x |
| Image Area Dose Product | (0018,115E) | DS | | x |
| Comments on Radiation Dose | (0040,0310) | ST | | x |
| Exposure Dose Sequence | (0040,030E) | SQ | | Zero or more items |
| >KVp | (0018,0060) | DS | | X |
| >Exposure Time | (0018,1150) | IS | | x |
| >X-ray Tube Current | (0018,1151) | IS | | x |
| **Billing and Material Code** | | | | |
| Billing Procedure Step Sequence | (0040,0320) | SQ | | Zero or more items |
| >Code Value | (0008,0100) | SH | | x |
| >Coding Scheme Designator | (0008,0102) | SH | | x |
| >Coding Scheme Version | (0008,0103) | SH | | x |
| >Code Meaning | (0008,0104) | LO | | x |
| Film Consumption Sequence | (0040,0321) | SQ | | Zero or more items |
| >Number of Films | (2100,0170) | IS | | x |
| >Medium Type | (2000,0030) | CS | | x |
| >Film Size ID | (2010,0050) | CS | | x |
| Billing Supplies and Devices Sequence | (0040,0324) | SQ | | Zero or more items |
| >Quantity Sequence | (0040,0293) | SQ | | x |
| >>Quantity | (0040,0294) | DS | | x |
| >>Measuring Units Sequence | (0040,0295) | SQ | | Zero or more items |
| >>>Code Value | (0008,0100) | SH | | x |
| >>>Coding Scheme Designator | (0008,0102) | SH | | x |
| >>>Coding Scheme Version | (0008,0103) | SH | | x |
| >>>Code Meaning | (0008,0104) | LO | | x |
| Billing Item Sequence | (0040,0296) | SQ | | Zero or more items |
| >>Code Value | (0008,0100) | SH | | x |
| >>Coding Scheme Designator | (0008,0102) | SH | | x |
| >>Coding Scheme Version | (0008,0103) | SH | | x |
| >>Code Meaning | (0008,0104) | LO | | x |

### 4.2.6.4 Association Acceptance Policy

The MPPS SCU AE does not accept Associations.

## 4.2.7  Q/R SCU AE Specification

### 4.2.7.1  SOP Classes

The Q/R SCU AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-57**
**SOP CLASSES FOR THE Q/R SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Patient Root Q/R Information Model – Find | 1.2.840.10008.5.1.4.1.2.1.1 | Yes | No |
| Patient Root Q/R Information Model – Move | 1.2.840.10008.5.1.4.1.2.1.2 | Yes | No |

### 4.2.7.2  Association Policies

#### 4.2.7.2.1  General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-58**
**DICOM APPLICATION CONTEXT FOR THE Q/R SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

#### 4.2.7.2.2  Number of Associations

The Q/R SCU AE can initiate up to three Associations at a time.

**Table 4.2-59**
**NUMBER OF ASSOCIATIONS INITIATED FOR THE Q/R SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

#### 4.2.7.2.3  Asynchronous Nature

The Q/R SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-60**
**ASYNCHRONOUS NATURE FOR THE Q/R SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

#### 4.2.7.2.4  Implementation Identifying Information

The implementation information for this Application Entity is:

**Table 4.2-61**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE Q/R SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.7.3    Association Initiation Policy

#### 4.2.7.3.1        Activity – Query and Retrieve Images

##### 4.2.7.3.1.1        Description and Sequencing of Activities

The Q/R SCU AE is activated when the user selects a remote node to query and enters some key information, Patient's Name, Patient ID and/or Study Date. The user can select studies, series and images to be retrieved. The images will be received at the Storage SCP AE. The system requests Image Level Move only.
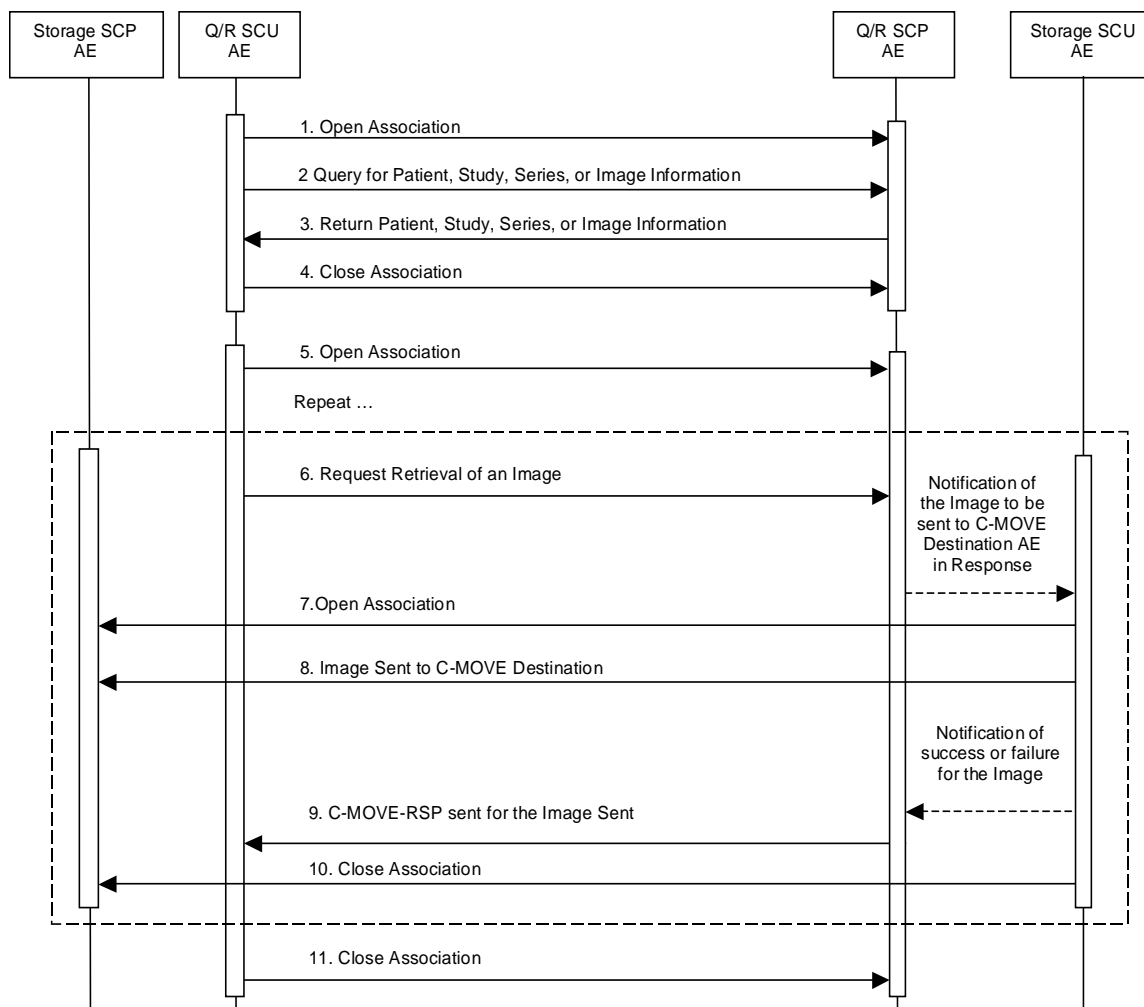


**Figure 4.2-8**
**SEQUENCING OF ACTIVITY – QUERY AND RETRIEVE IMAGES**

The following sequencing constraints illustrated in the Figure above:

1. The Q/R SCU AE opens an Association with the Q/R SCP AE.

2. The Q/R SCU AE sends a C-FIND-RQ Message

3. The Q/R SCP AE returns a C-FIND-RSP Message to the Q/R SCU AE with matching information. A C-FIND-RSP is sent for each entity matching the identifier specified in the C-FIND-RQ. A final C-FIND-RSP is sent indicating that the matching is complete.

4. The Q/R SCU AE closes the Association.

5. The Q/R SCU AE opens an Association with the Q/R SCP AE.

6. The Q/R SCU AE sends a C-MOVE-RQ Message. The Q/R SCP AE notifies the Storage SCU AE to send the Composite SOP Instances to the peer C-MOVE Destination AE as indicated in the C-MOVE-RQ.

7. The Storage SCU AE opens an Association with the C-MOVE Destination AE.

8. The Storage SCU AE sends images to the C-MOVE Destination AE. The Storage SCU AE indicates to the Q/R SCP AE whether the transfer succeeded or failed.

9. The Q/R SCP AE then returns a C-MOVE-RSP indicating this success or failure.

10. The Storage SCU AE closes the Association.

11. The Q/R SCU AE closes the Association.

### 4.2.7.3.1.2    Proposed Presentation Contexts

The Q/R SCU AE will propose Presentation Contexts as shown in the following Table:

**Table 4.2-62**
**PROPOSED PRESENTATION CONTEXTS FOR REAL-WORLD ACTIVITY**
**QUERY AND RETRIEVE IMAGES**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | | Ext. |
| Name | UID | Name List | UID List | Role | Neg. |
| Patient Root Q/R Information Model – Find | 1.2.840.10008.5.1.4.1.2.1.1 | Implicit VR Little Endian Explicit VR Little Endian | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 | SCU | None |
| Patient Root Q/R Information Model – Move | 1.2.840.10008.5.1.4.1.2.1.2 | Implicit VR Little Endian Explicit VR Little Endian | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 | SCU | None |

### 4.2.7.3.1.3 SOP Specific Conformance for Q/R Find SOP Classes

The Q/R SCU AE provides standard conformance to the Query/Retrieve Find SOP Classes as an SCU.

The behavior of the Q/R SCU AE when encountering status codes in a Q/R C-FIND response is summarized in the Table below:

**Table 4.2-63**
**THE Q/R SCU AE C-FIND RESPONSE STATUS BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Matching is complete | 0000 | The SCP has completed the matches. Worklist items are available for display or further processing. |
| Refused | Out of Resources | A700H | The Association is aborted using A-ABORT and the worklist query is marked as failed.   The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |
| Failed | Identifier does not match SOP Class | A900H | The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |
| Failed | Unable to Process | CxxxH | The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |
| Cancel | Matching terminated due to Cancel request | FE00H | If the query was cancelled due to too may worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. Otherwise, the Association is aborted using A-ABORT and the worklist query is marked as failed.   The status meaning is logged and reported to the user if an interactive query. |
| Pending | Matches are continuing | FF00H | The worklist item contained in the Identifier is collected for later display or further processing. |
| Pending | Matches are continuing – Warning that one or more Optional Keys were not supported | FF01H | The worklist item contained in the Identifier is collected for later display or further processing. The status meaning is logged only once for each C-FIND operation. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the worklist is marked as failed.   The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged. |

The behavior of the Q/R SCU AE during communication failure is summarized in the Table below.

**Table 4.2-64**
**Q/R FIND COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the patient, the study, series or image query is marked as failed. The reason is logged and reported to the user if an interactive query. |
| Association aborted by the SCP or network layers | The patient, the study, series or image query is marked as failed. The reason is logged and reported to the user if an interactive query. |

All queries are initiated at the highest level of the information model (the PATIENT level), and then for each response received, recursively repeated at the next lower levels (the STUDY, the SERIES and then IMAGE levels), in order to completely elucidate the "tree" of instances available on the remote AE.

The Table below provides a description of the Q/R SCU AE C-FIND Request Identifier.

**Table 4.2-65**
**PATIENT ROOT REQUEST IDENTIFIER FOR C-FIND-SCU**

| Name | Tag | Types of Matching |
|---|---|---|
| **Patient Level** | | |
| Patient ID | (0010,0020) | S,*,U |
| Patient's Name | (0010,0010) | S,*,U |
| Patient's Birth Date | (0010,0030) | S,U,R |
| Patient's Sex | (0010,0040) | S,*,U |
| Ethnic Group | (0010,2160) | S,*,U |
| Patient Comments | (0010,4000) | *,U |
| Number of Patient Related Studies | (0020,1200) | U |
| Number of Patient Related Series | (0020,1202) | U |
| Number of Patient Related Instances | (0020,1204) | U |
| **Study Level** | | |
| Study ID | (0020,0010) | S,*,U |
| Study Description | (0008,1030) | S,*,U |
| Modalities in Study | (0008,0061) | *,U |
| Study Date | (0008,0020) | S,U,R |
| Study Time | (0008,0030) | S,U,R |
| Referring Physician's Name | (0008,0090) | S,*,U |
| Accession Number | (0008,0050) | S,*,U |
| Name of Physician(s) Reading Study | (0008,1060) | S,*,U |
| Patient's Age | (0010,1010) | S,*,U |
| Patient's Size | (0010,1020) | S,U |
| Patient's Weight | (0010,1030) | S,U |
| Occupation | (0010,2180) | S,*,U |
| Additional Patient History | (0010,21B0) | *,U |
| Study Instance UID | (0020,000D) | UNIQUE |
| Number of Study Related Series | (0020,1206) | U |
| Number of Study Related Instances | (0020,1208) | U |
| **Series Level** | | |
| Series Number | (0020,0011) | S,U |
| Series Description | (0008,103E) | S,*,U |
| Modality | (0008,0060) | S,*,U |
| Series Date | (0008,0021) | S,U,R |
| Series Time | (0008,0031) | S,U,R |
| Performing Physician's Name | (0008,1050) | S,*,U |
| Protocol Name | (0018,1030) | S,*,U |
| Operator's Name | (0008,1070) | S,*,U |
| Number of Series Related Instances | (0020,1209) | U |
| **Image Level** | | |

| Instance Number | (0020,0013) | S,U |
|---|---|---|
| Image Comments | (0020,4000) | U |
| Content Date | (0008,0023) | S,U,R |
| Content Time | (0008,0033) | S,U,R |
| SOP Instance UID | (0008,0018) | UNIQUE |
| Modality | (0008,0060) | S,*,U |

Types of Matching:

The types of Matching supported by the Q/R SCU AE. An "S" indicates the identifier attribute uses Single Value Matching, an "R" indicates Range Matching, an "*" indicates wildcard matching, and a 'U' indicates Universal Matching. "UNIQUE" indicates that this is the Unique Key for that query level, in which case Universal Matching or Single Value Matching is used depending on the query level.

#### 4.2.7.3.1.4    SOP Specific Conformance for Q/R Move SOP Classes

The Q/R SCU AE provides standard conformance to the Query/Retrieve Move SOP Classes as an SCU.

The behavior of the Q/R SCU AE when encountering status codes in a Q/R C-MOVE response is summarized in the Table below:

**Table 4.2-66**
**THE Q/R SCU AE C-MOVE RESPONSE STATUS BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Sub-operations complete – No Failures | 0000 | The Storage SCP AE has successfully received the SOP Instance. If all SOP Instances in a move job have status success then the job is marked as complete. |
| Refused | Out of Resources – Unable to calculate number of matches | A701H | The Association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. This is a transient failure. |
| | Out of Resources – Unable to perform sub-operations | A702H | The Association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| | Move destination unknown | A801H | The Association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| Failed | Identifier does not match SOP Class | A900H | The Association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |
| Warning | Sub-operations complete but one or more failures. | B000H | The Association is aborted using A-ABORT and the move job is marked as failed. The status meaning is logged and the job failure is reported to the user via the job control application. |

The behavior of the Q/R SCU AE during communication failure is summarized in the Table below.

**Table 4.2-67**
**Q/R MOVE COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the retrieve is marked as failed. The reason is logged and reported to the user. |
| Association aborted by the SCP or network layers | The retrieve is marked as failed. The reason is logged and reported to the user. |

### 4.2.7.4    Association Acceptance Policy

The Q/R SCU AE does not accept Associations.

### 4.2.8 Storage SCP AE Specification

### 4.2.8.1 SOP Classes

The Storage SCP AE provides Standard Conformance to the following SOP Classes:

**Table 4.2-68**
**SOP CLASSES FOR THE STORAGE SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Verification | 1.2.840.10008.1.1 | No | Yes |
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | No | Yes |

### 4.2.8.2 Association Policies

### 4.2.8.2.1 General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-69**
**DICOM APPLICATION CONTEXT FOR THE STORAGE SCP AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

### 4.2.8.2.2 Number of Associations

The Storage SCP AE can support up to three Associations at a time.

**Table 4.2-70**
**NUMBER OF ASSOCIATIONS ACCEPTED FOR THE STORAGE SCP AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

### 4.2.8.2.3 Asynchronous Nature

The Storage SCP AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-71**
**ASYNCHRONOUS NATURE FOR THE STORAGE SCP AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

### 4.2.8.2.4 Implementation Identifying Information

The implementation information for the Storage SCP AE is:

**Table 4.2-72**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE STORAGE SCP AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.8.3 Association Initiation Policy

The Storage SCP AE does not initiate Associations.

## 4.2.8.4    Association Acceptance Policy

The Storage SCP AE accepts Associations only if they have valid Presentation Contexts. If none of the requested Presentation Contexts are accepted then the Association Request itself is rejected. It can be configured to only accept Associations with certain hosts (using TCP/IP address) and/or Application Entity Titles.
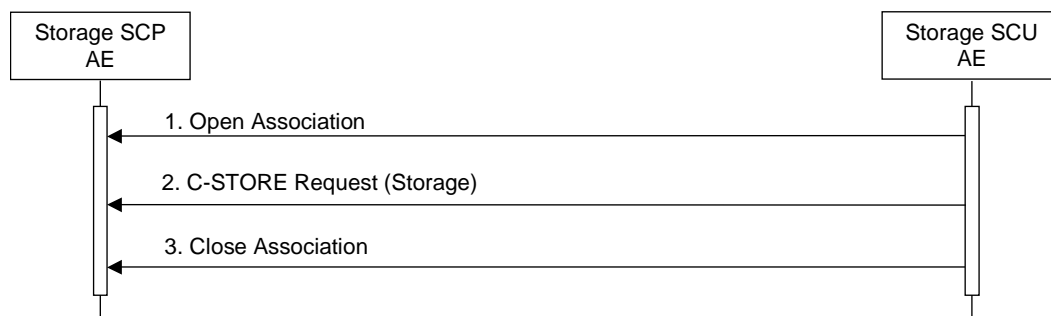


**Figure 4.2-9**
**SEQUENCING OF ACTIVITY – STORE IMAGES TO THE LOCAL FILE SYSTEM**

A possible sequence of interactions between the Storage SCP AE and a Storage SCU AE is illustrated in the Figure above:

1.  The Storage SCU AE opens an Association with the Storage SCP AE.

2.  The Storage SCU AE sends images to the Storage SCP AE using a Storage request (C-STORE) and the Storage SCP AE replies with a C-STORE response (status success).

3.  The Storage SCU AE closes the Association with the Storage SCP AE.

The Storage SCP AE may reject Association attempts as shown in the Table below. The Result, Source and Reason/Diag columns represent the values returned in the corresponding fields of an ASSOCIATE-RJ PDU (see PS 3.8, Section 9.3.4).   The following abbreviations are used in the Source column:

1 – DICOM UL service-user

2 – DICOM UL service-provider (ASCE related function)

3 – DICOM UL service-provider (Presentation related function)

**Table 4.2-73**
**ASSOCIATION REJECTION REASONS**

| Result | Source | Reason/Diag | Explanation |
|---|---|---|---|
| 2 – rejected-transient | c | 2 – local-limit-exceeded | The (configurable) maximum number of simultaneous Associations has been reached. An Association request with the same parameters may succeed at a later time. |
| 2 – rejected-transient | c | 1 – temporary-congestion | No Associations can be accepted at this time due to the real-time requirements of higher priority activities (e.g. during image acquisition no Associations will be accepted) or because insufficient resources are available (e.g. memory, processes, threads).   An Association request with the same parameters may succeed at a later time. |
| 1 – rejected-permanent | a | 2 – application-context-name-not-supported | The Association request contained an unsupported Application Context Name.   An association request with the same parameters will not succeed at a later time. |
| 1 – rejected-permanent | a | 7 – called-AE-title-not-recognized | The Association request contained an unrecognized Called AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association initiator is incorrectly configured and attempts to address the Association acceptor using the wrong AE Title. |
| 1 – rejected-permanent | a | 3 – calling-AE-title-not-recognized | The Association request contained an unrecognized Calling AE Title. An Association request with the same parameters will not succeed at a later time unless configuration changes are made. This rejection reason normally occurs when the Association acceptor has not been configured to recognize the AE Title of the Association initiator. |
| 1 – rejected-permanent | b | 1 – no-reason-given | The Association request could not be parsed.   An Association request with the same format will not succeed at a later time. |

#### 4.2.8.4.1.1 Accepted Presentation Contexts

The default Behavior of the Storage SCP AE supports the Implicit VR Little Endian, Explicit VR Little Endian Transfer Syntaxes.

If the both Transfer Syntaxes are proposed per Presentation Context then the Storage SCP AE will select Implicit VR Little Endian Transfer Syntax.

Any of the Presentation Contexts shown in the following table are acceptable to the Storage SCP AE.

**Table 4.2-74**
**ACCEPTED PRESENTATION CONTEXTS BY THE STORAGE SCP AE**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Ext. Neg. |
| Name | UID | Name | UID | | |
| Verification | 1.2.840.10008.1.1 | Implicit VR Little Endian | 1.2.840.10008.1.2 | SCP | None |
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Implicit VR Little Endian Explicit VR Little Endian JPEG Lossless (Process 14[Section Value1]) | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.4.70 | SCP | None |

#### 4.2.8.4.1.2 SOP Specific Conformance for Verification SOP Class

The Storage SCP AE provides standard conformance to the Verification SOP Class as an SCP.

#### 4.2.8.4.1.3 SOP Specific Conformance for Storage SOP Classes

The associated Activity with the Storage service is the storage of medical image data received over the network on a designated hard disk. The Storage SCP AE will return a failure status if it is unable to store the images on to the hard disk.

The Storage SCP AE is Level 0 conformant as a Storage SCP.

**Table 4.2-75**
**THE STORAGE SCP AE C-STORE RESPONSE STATUS RETURN REASONS**

| Service Status | Further Meaning | Status Code | Reason |
|---|---|---|---|
| Success | Success | 0000 | The Composite SOP Instance was successfully received, verified, and stored in the system database. |
| Refused | Out of Resources | A700H | Indicates that there was not enough local resources. |
| Error | Data Set does not match SOP Class | A900H | Indicates that the Data Set does not encode a valid instance of the SOP Class specified. |
| | Cannot understand | C000H | Indicates that the Storage SCP AE cannot parse the Data Set into Elements. |

### 4.2.9  Print SCU AE Specification

### 4.2.9.1  SOP Classes

The Print SCU AE provides Standard Conformance to the following Meta SOP Classes:

**Table 4.2-76**
**META SOP CLASSES FOR THE PRINT SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Basic Grayscale Print Management Meta | 1.2.840.10008.5.1.1.9 | Yes | No |

The above Meta SOP Classes are defined by the following set of supported SOP Classes:

**Table 4.2-77**
**SOP CLASSES FOR THE PRINT SCU AE**

| SOP Class Name | SOP Class UID | SCU | SCP |
|---|---|---|---|
| Basic Film Session SOP Class | 1.2.840.10008.5.1.1.1 | Yes | No |
| Basic Film Box SOP Class | 1.2.840.10008.5.1.1.2 | Yes | No |
| Basic Grayscale Image Box SOP Class | 1.2.840.10008.5.1.1.4 | Yes | No |
| Printer SOP Class | 1.2.840.10008.5.1.1.16 | Yes | No |
| Print Job SOP Class | 1.2.840.10008.5.1.1.14 | Yes | No |
| Presentation LUT SOP Class | 1.2.840.10008.5.1.1.23 | No | No |

### 4.2.9.2  Association Policies

### 4.2.9.2.1  General

The DICOM standard application context name for DICOM 3.0 is always proposed:

**Table 4.2-78**
**DICOM APPLICATION CONTEXT FOR THE PRINT SCU AE**

| Application Context Name | 1.2.840.10008.3.1.1.1 |
|---|---|

### 4.2.9.2.2  Number of Associations

The Print SCU AE can initiate up to two Associations at a time.

**Table 4.2-79**
**NUMBER OF ASSOCIATIONS ACCEPTED FOR THE PRINT SCU AE**

| Maximum number of simultaneous Associations | 1 |
|---|---|

### 4.2.9.2.3  Asynchronous Nature

The Print SCU AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

**Table 4.2-80**
**ASYNCHRONOUS NATURE FOR THE PRINT SCU AE**

| Maximum number of outstanding asynchronous transactions | 1 |
|---|---|

#### 4.2.9.2.4 Implementation Identifying Information

The implementation information for the Print SCU AE is:

**Table 4.2-81**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR THE PRINT SCU AE**

| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
|---|---|
| Implementation Version Name | TM_INFINIX_V2.0 |

### 4.2.9.3 Association Initiation Policy

#### 4.2.9.3.1 Activity – Send Images & Print Management Information

#### 4.2.9.3.1.1 Description and Sequencing of Activities

A user composes images onto film sheets and requests them to be sent to a specific hardcopy device. The user can select the desired film format and number of copies.
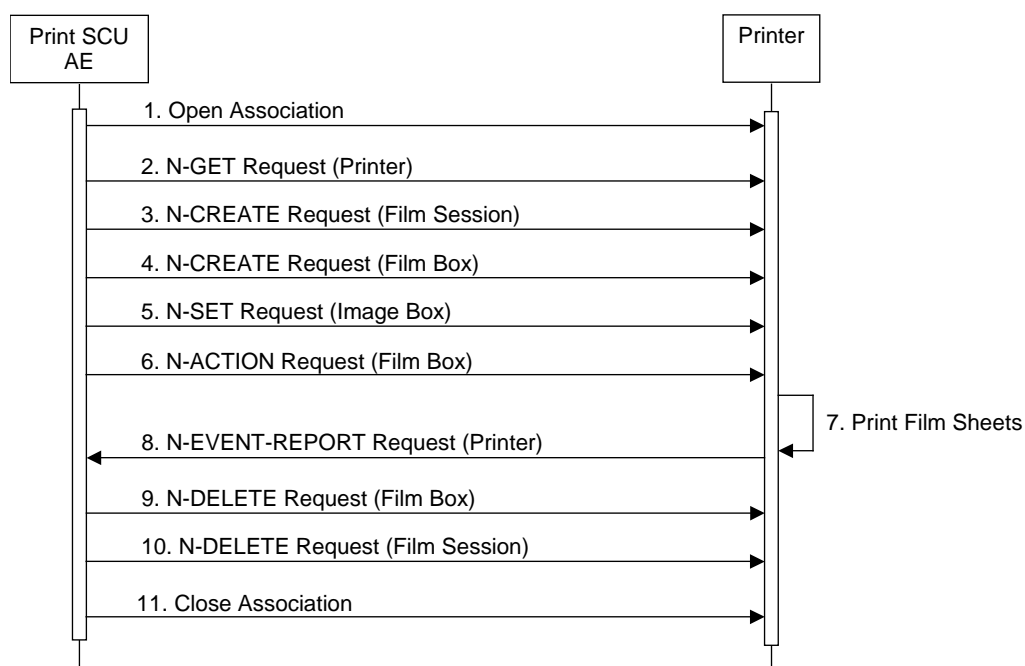


**Figure 4.2-10**
**SEQUENCING OF ACTIVITY – SEND IMAGES & PRINT MANAGEMENT INFORMATION**

A typical sequence of DIMSE messages sent over an association between the Print SCU AE and a Printer is illustrated in the Figure above:

1. The Print SCU AE opens an Association with the Printer.

2. N-GET on the Printer SOP Class is used to obtain current printer status information.

3. N-CREATE on the Film Session SOP Class creates a Film Session.

4. N-CREATE on the Film Box SOP Class creates a Film Box linked to the Film Session.

5. N-SET on the Image Box SOP Class transfers the contents of the film sheet to the printer.

6. N-ACTION on the Film Box SOP Class instructs the Printer to print the Film Box.

7. The Printer prints the requested number of film sheets.

8. The Printer asynchronously reports its status via N-EVENT-REPORT notification (Printer SOP Class). The printer can send this message at any time. The Print SCU AE does not require the N-EVENT-REPORT to be sent. The Print SCU AE is capable of receiving an N-EVENT-REPORT notification at any time during an association.

9. N-DELETE on the Film Box SOP Class deletes the complete Film Box SOP Instance hierarchy.

10. N-DELETE on the Film Session SOP Class deletes the complete Film Session SOP Instance hierarchy.

11. The Print SCU AE closes the Association with the Printer.

### 4.2.9.3.1.2 Proposed Presentation Contexts

The Print SCU AE is capable of proposing the Presentation Contexts shown in the Table below:

**Table 4.2-82**
**PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY**
**SEND IMAGES & PRINT MANAGEMENT INFORMATION**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | | Ext. |
| Name | UID | Name List | UID List | Role | Neg. |
| Basic Grayscale Print Management Meta | 1.2.840.10008.5.1.1.9 | Implicit VR Little Endian Explicit VR Little Endian | 1.2.840.10008.1.2 1.2.840.10008.1.2.1 | SCU | None |

### 4.2.9.3.1.3    Common SOP Specific Conformance for all Print SOP Classes

The general behavior of the Print SCU AE during communication failure is summarized in the Table below.
This behavior is common for all SOP Classes supported by the Print SCU AE.

**Table 4.2-83**
**PRINT COMMUNICATION FAILURE BEHAVIOR**

| Exception | Behavior |
|---|---|
| Timeout | The Association is aborted using A-ABORT and the print-job is marked as failed.   The reason is logged and the job failure is reported to the user via the job control application. |
| Association aborted by the SCP or network layers | The print-job is marked as failed.   The reason is logged and the job failure is reported to the user via the job control application. |

### 4.2.9.3.1.4    SOP Specific Conformance for Printer SOP Class

The Print SCU AE supports the following DIMSE operations and notifications for the Printer SOP Class:

— N-GET

— N-EVENT-REPORT

Details of the supported attributes and status handling behavior are described in the following subsections.

### 4.2.9.3.1.4.1  Printer SOP Class Operations (N-GET)

The Print SCU AE uses the Printer SOP Class N-GET operation to obtain information about the current printer status. The attributes obtained via N-GET are listed in the Table below:

**Table 4.2-84**
**PRINTER SOP CLASS N-GET REQUEST ATTRIBUTES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Printer Status | (2110,0010) | CS | Provided by Printer | ALWAYS | Printer |
| Printer Status Info | (2110,0020) | CS | Provided by Printer | ALWAYS | Printer |

The Printer Status information is evaluated as follows:

1.  If Printer status (2110,0010) is NORMAL, the print-job continues to be printed.

2.  If Printer status (2110,0010) is FAILURE, the print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job control application.

3.  If Printer status (2110,0010) is WARNING, the print-job continues to be printed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job control application.

4.  If Printer status (2110,0010) is empty, the print-job continues to be printed. The contents of Printer Status Info (2110,0020) is logged as NOT READY and reported to the user via the job control application.

The behavior of The Print SCU AE when encountering status codes in a N-GET response is summarized in the Table below:

**Table 4.2-85**
**PRINTER SOP CLASS N-GET RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The request to get printer status information was success. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |

#### 4.2.9.3.1.4.2 Printer SOP Class Notifications (N-EVENT-REPORT)

The Print SCU AE is capable of receiving an N-EVENT-REPORT request at any time during an association.

The behavior of The Print SCU AE when receiving Event Types within the N-EVENT-REPORT is summarized in the Table below:

**Table 4.2-86**
**PRINTER SOP CLASS N-EVENT-REPORT BEHAVIOUR**

| Event Type Name | Event Type ID | Behavior |
|---|---|---|
| Normal | 1 | The print-job continues to be printed. |
| Warning | 2 | The print-job continues to be printed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job-control application. |
| Failure | 3 | The print-job is marked as failed. The contents of Printer Status Info (2110,0020) is logged and reported to the user via the job-control application. |
| * | * | An invalid Event Type ID will cause a status code of 0113H to be returned in a N-EVENT-REPORT response. |

The reasons for returning specific status codes in a N-EVENT-REPORT response are summarized in the Table below:

**Table 4.2-87**
**PRINTER SOP CLASS N-EVENT-REPORT RESPONSE STATUS REASONS**

| Service Status | Further Meaning | Status Code | Reasons |
|---|---|---|---|
| Success | Success | 0000 | The notification event has been successfully received. |
| Failure | No Such Event Type | 0113H | An invalid Event Type ID was supplied in the N-EVENT-REPORT request. |
| Failure | Processing Failure | 0110H | An internal error occurred during processing of the N-EVENT-REPORT.   A short description of the error will be returned in Error Comment (0000,0902). |

#### 4.2.9.3.1.5    SOP Specific Conformance for the Film Session SOP Class

The Print SCU AE supports the following DIMSE operations for the Film Session SOP Class:

— N-CREATE
— N-DELETE

Details of the supported attributes and status handling behavior are described in the following subsections.

#### 4.2.9.3.1.5.1  Film Session SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

**Table 4.2-88**
**FILM SESSION SOP CLASS N-CREATE REQUEST ATTRIBUTES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Number of Copies | (2000,0010) | IS | 1 .. 99 | ALWAYS | User |
| Medium Type | (2000,0030) | CS | BLUE FILM, CLEAR FILM or PAPER | ALWAYS | User |
| Film Destination | (2000,0040) | CS | MAGAZINE or PROCESSOR | ALWAYS | User |

\*:The behavior of The Print SCU AE when encountering status codes in a N-CREATE response is summarized in the Table below:

**Table 4.2-89**
**FILM SESSION SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| Warning | Attribute Value Out of Range | 0116H | The N-CREATE operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Attribute List Error | 0107H | The N-CREATE operation is considered successful if it is configured that the status would be considered successful. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user. |

### 4.2.9.3.1.5.2  Film Session SOP Class Operations (N-DELETE)

The behavior of The Print SCU AE when encountering status codes in a N-DELETE response is summarized in the Table below:

**Table 4.2-90**
**PRINTER SOP CLASS N-DELETE RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |

### 4.2.9.3.1.6 SOP Specific Conformance for the Film Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Film Box SOP Class:

— N-CREATE
— N-ACTION

Details of the supported attributes and status handling behavior are described in the following subsections.

### 4.2.9.3.1.6.1 Film Box SOP Class Operations (N-CREATE)

The attributes supplied in an N-CREATE Request are listed in the Table below:

**Table 4.2-91**
**FILM BOX SOP CLASS N-CREATE REQUEST ATTRIBUTES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Image Display Format | (2010,0010) | CS | STANDARD\1,1 | ALWAYS | User |
| Referenced Film Session Sequence | (2010,0500) | SQ | | ALWAYS | Auto |
| >Referenced SOP Class UID | (0008,1150) | UI | 1.2.840.10008.5.1.1.2 | ALWAYS | Auto |
| >Referenced SOP Instance UID | (0008,1155) | UI | From created Film Session SOP Instance | ALWAYS | Auto |
| Film Orientation | (2010,0040) | CS | PORTRAIT or LANDSCAPE | ALWAYS | User |
| Film Size ID | (2010,0050) | CS | 14INX17IN, 14INX14IN, 11INX14IN, 11INX11IN, 8INX11IN, 8INX10IN, etc. | ALWAYS | User |
| Magnification Type | (2010,0060) | CS | REPLICATE, BILINEAR, CUBIC or NONE | ALWAYS | User |
| Border Density | (2010,0100) | CS | BLACK or WHITE | ALWAYS | User |
| Min Density | (2010,0120) | US | 0 .. 9999 | ALWAYS | User |
| Max Density | (2010,0130) | US | 0 .. 9999 | ALWAYS | User |

The behavior of the Print SCU AE when encountering status codes in a N-CREATE response is summarized in the Table below:

**Table 4.2-92**
**FILM BOX SOP CLASS N-CREATE RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. |
| Warning | Requested Min Density or Max Density outside of printer's operating range | B605H | The N-CREATE operation is considered successful if it is configured that the status would be considered successful. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |

#### 4.2.9.3.1.6.2 Film Box SOP Class Operations (N-ACTION)

An N-ACTION Request is issued to instruct the Print SCP to print the contents of the Film Box. The Action Reply argument in an N-ACTION response is not evaluated.

The behavior of The Print SCU AE when encountering status codes in a N-ACTION response is summarized in the Table below:

**Table 4.2-93**
**FILM BOX SOP CLASS N-ACTION RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has completed the operation successfully.   The film has been accepted for printing. |
| Warning | Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page) | B603H | The N-ACTION operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Image size is larger than Image Box size. The image has been demagnified. | B604H | The N-ACTION operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Image size is larger than Image Box size. The image has been cropped to fit. | B609H | The N-ACTION operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit. | B60AH | The N-ACTION operation is considered successful if it is configured that the status would be considered successful. |
| Failure | Unable to create Print Job SOP Instance; print queue is full. | C602H | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |
| Failure | Image size is larger than Image Box size. | C603H | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |
| Failure | Combined Print Image Size is larger than Image Box size. | C613H | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the print-job is marked as failed.   The status meaning is logged and reported to the user. |

#### 4.2.9.3.1.7    SOP Specific Conformance for the Grayscale Image Box SOP Class

The Print SCU AE supports the following DIMSE operations for the Grayscale Image Box SOP Class:

— N-SET

Details of the supported attributes and status handling behavior are described in the following subsections.

#### 4.2.9.3.1.7.1  Grayscale Image Box SOP Class Operations (N-SET)

The attributes supplied in an N-SET Request are listed in the Table below:

**Table 4.2-94**
**GRAYSCALE IMAGE BOX SOP CLASS N-SET REQUEST ATTRIBUTES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Image Position | (2020,0010) | US | 1 .. 36 | ALWAYS | Auto |
| Basic Grayscale Image Sequence | (2020,0110) | SQ | | ALWAYS | Auto |
| >Samples Per Pixel | (0028,0002) | US | 1 | ALWAYS | Auto |
| >Photometric Interpretation | (0028,0004) | CS | MONOCHROME2 | ALWAYS | Auto |
| >Rows | (0028,0010) | US | | ALWAYS | Auto |
| >Columns | (0028,0011) | US | | ALWAYS | Auto |
| >Pixel Aspect Ratio | (0028,0034) | IS | 1\1 | ALWAYS | Auto |
| >Bits Allocated | (0028,0100) | US | 8 | ALWAYS | Auto |
| >Bits Stored | (0028,0101) | US | 8 | ALWAYS | Auto |
| >High Bit | (0028,0102) | US | 7 | ALWAYS | Auto |
| >Pixel Representation | (0028,0103) | US | 0 | ALWAYS | Auto |
| >Pixel Data | (7FE0,0010) | OB | | ALWAYS | Auto |

The behavior of the Print SCU AE when encountering status codes in a N-SET response is summarized in the Table below:

**Table 4.2-95**
**GRAYSCALE IMAGE BOX SOP CLASS N-SET RESPONSE STATUS HANDLING BEHAVIOR**

| Service Status | Further Meaning | Status Code | Behavior |
|---|---|---|---|
| Success | Success | 0000 | The SCP has completed the operation successfully. Image successfully stored in Image Box. |
| Warning | Image size is larger than Image Box size. The image has been demagnified. | B604H | The N-SET operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Requested Min Density or Max Density outside of printer's operating range. | B605H | The N-SET operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Image size is larger than Image Box size. The image has been cropped to fit. | B609H | The N-SET operation is considered successful if it is configured that the status would be considered successful. |
| Warning | Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit. | B60AH | The N-SET operation is considered successful if it is configured that the status would be considered successful. |
| Failure | Image size is larger than Image Box size. | C603H | The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user. |
| Failure | Insufficient memory in printer to store the image. | C605H | The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user. |
| Failure | Combined Print Image Size is larger than Image Box size. | C613H | The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user. |
| * | * | Any other status code. | The Association is aborted using A-ABORT and the print-job is marked as failed. The status meaning is logged and reported to the user. |

## 4.2.9.4    Association Acceptance Policy

The Print SCU AE does not accept Associations.

## 4.3 NETWORK INTERFACES

### 4.3.1 Physical Network Interface

This Product supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options:

**Table 4.3-1**
**SUPPORTED PHYSICAL NETWORK INTERFACES**

| |
|---|
| Ethernet 1000baseT |
| Ethernet 100baseT |
| Ethernet 10baseT |

### 4.3.2 Additional Protocols

None.

## 4.4 CONFIGURATION

### 4.4.1 AE Title/Presentation Address Mapping

#### 4.4.1.1 Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured via the Service/Installation Tool. The Field Service Engineer can configure the TCP Port via the Service/Installation Tool.

**Table 4.4-1**
**AE TITLE CONFIGURATION TABLE**

| Application Entity | Default AE Title | Default TCP/IP Port |
|---|---|---|
| Verification SCP | DICOM_LOCAL_SCP | 104 |
| Storage Commitment SCU | | |
| Storage SCP | | |
| Verification SCU | VERIFY_AETITLE | Not Applicable |
| MWM SCU | MWMSCU_AE | |
| MPPS SCU | MPPSSCU_AE | |
| Print SCU | PrintSCU_AE | |
| Query/Retrieve SCU | DICOM_LOCAL_SCU | |
| Storage SCU | | |

#### 4.4.1.2 Remote AE Title/Presentation Address Mapping

The AE Titles, host names and port numbers of remote applications are configured using the Service/Installation Tool.

## 4.4.2  Parameters

A large number of parameters related to acquisition and general operation can be configured using the Service/Installation Tool. The Table below only shows those configuration parameters relevant to DICOM communication. See the Product's Service Manual for details on general configuration capabilities.

**Table 4.4-2**
**CONFIGURATION PARAMETERS TABLE**

| Parameter | Configurable (Yes/No) [Range] | Default Value |
|---|---|---|
| **General Parameters** | | |
| Max PDU Receive Size | Yes [4KB-512KB] | 28 KBytes |
| Max PDU Send Size | | |
| Time-out waiting for a acceptance or rejection response to an Association Request (Application Level Timeout) | Yes [1-999999] | 60 Sec |
| Time-out waiting for a response to an Association release request (Application Level Timeout) | Yes [1-999999] | 60 sec |
| Time-out waiting for completion of a TCP/IP connect request (Low-level timeout) | Yes [1-999999] | 60 sec |
| Time-out awaiting a Response to a DIMSE Request (Low-Level Timeout) | Yes [1-999999] | 15 sec |
| Time-out for waiting for data between TCP/IP-packets (Low Level Timeout) | Yes [1-999999] | 60 sec |
| **Storage SCU Parameters** | | |
| Storage SCU time-out waiting for a response to a C-STORE-RQ | Yes [1-999999] | 180sec |
| Number of times a failed send job may be retried | No | Forever, until the job succeeds or user deletes the job. |
| Delay between retrying failed send jobs | No | 60sec |
| Maximum number of simultaneously initiated Associations by the Storage SCU AE | Yes | 10 |
| Supported Transfer Syntaxes (separately configurable for each remote AE) | No | Implicit VR Little Endian |
| Behavior when receiving the Warning "Coercion of Data Elements" as service status. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Data Set does not match SOP Class" as service status. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Elements Discarded" as service status. | Yes [Considered as Success or Failure] | Considered as Failure |
| **Storage Commitment SCU Parameters** | | |

| Parameter | Configurable (Yes/No) [Range] | Default Value |
|---|---|---|
| Storage Commitment SCU time-out waiting for a response to a N-ACTIION-RQ | Yes [1-999999] | 30 Sec |
| Maximum number of simultaneously initiated Associations by the Storage Commitment SCU AE | No | 1 |
| Timeout waiting for a Storage Commitment Notification (maximum duration of applicability for a Storage Commitment Transaction UID). | No | Forever |
| Maximum number of simultaneously accepted Associations by the Storage Commitment SCU AE | No | 1 |
| Delay association release after sending a Storage Commitment Request (wait for a Storage Commitment Notification over the same association). | No | 0 |
| Behavior when receiving N-EVENT Report - the Storage Commitment Request Successful. | Yes | Permit the operator (s) to delete the Instances |
| **Modality Worklist SCU Parameters** | | |
| Modality Worklist SCU time-out waiting for the final response to a C-FIND-RQ | Yes [1-999999] | 180sec |
| Maximum number of simultaneously initiated Associations by the MWM SCU AE | No | 1 |
| **MPPS SCU Parameters** | | |
| MPPS SCU time-out waiting for a response to a N-CREATE-RQ | Yes [1-999999] | 180sec |
| MPPS SCU time-out waiting for a response to a N-SET-RQ | Yes [1-999999] | 180sec |
| MPPS SCU time-out waiting for a response to a N-GET-RQ | Yes [1-999999] | 180sec |
| Maximum number of simultaneously initiated Associations by the MPPS SCU AE | No | 1 |
| Supported Transfer Syntaxes for MPPS | Yes | Implicit VR Little Endian |
| Behavior when receiving the Warning "Attribute Value Out of Range" as service status. | Yes [Considered as Success or Failure] | Considered as Failure |
| **Storage SCP parameters** | | |
| Maximum number of simultaneously accepted Associations by the Storage SCP AE | No | 1 |
| **Print SCU Parameters** | | |
| Print SCU time-out waiting for a response to a N-GET-RQ | Yes [1-999999] | 180sec |
| Print SCU time-out waiting for a response to a N-CREATE-RQ | Yes [1-999999] | 180sec |
| Print SCU time-out waiting for a response to a N-SET-RQ | Yes [1-999999] | 180sec |

| Parameter | Configurable (Yes/No) [Range] | Default Value |
|---|---|---|
| Print SCU time-out waiting for a response to a N-ACTION-RQ | Yes [1-999999] | 180sec |
| Maximum number of simultaneously initiated Associations by the Print SCU AE | No | 1 |
| Supported Transfer Syntaxes (separately configurable for each remote printer) | Yes | Implicit VR Little Endian |
| Behavior when receiving the Warning "Attribute Value Out of Range" as service status of the Film Session N-CREATE. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Attribute List Error" as service status of the Film Session N-CREATE. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Requested Min Density or Max Density outside of printer's operating range" as service status of the Film Box N-CREATE. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Film Box SOP Instance hierarchy does not contain Image Box SOP Instances (empty page)" as service status of the Film Box N-ACTION. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Image size is larger than Image Box size. The image has been demagnified." as service status of the Film Box N-ACTION. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Image size is larger than Image Box size. The image has been cropped to fit." as service status of the Film Box N-ACTION. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit." as service status of the Film Box N-ACTION. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Image size is larger than Image Box size.   The image has been demagnified. " as service status of the Grayscale Image Box N-SET. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Requested Min Density or Max Density outside of printer's operating range." as service status of the Grayscale Image Box N-SET. | Yes [Considered as Success or Failure] | Considered as Failure |
| Behavior when receiving the Warning "Image size is larger than Image Box size.   The image has been cropped to fit." as service status of the Grayscale Image Box N-SET. | Yes [Considered as Success or Failure] | Considered as Failure |

| Parameter | Configurable (Yes/No) [Range] | Default Value |
|---|---|---|
| Behavior when receiving the Warning "Image size or Combined Print Image Size is larger than Image Box size. The image or combined Print Image has been decimated to fit." as service status of the Grayscale Image Box N-SET. | Yes [Considered as Success or Failure] | Considered as Failure |

# 5. MEDIA INTERCHANGE

## 5.1 IMPLEMENTATION MODEL
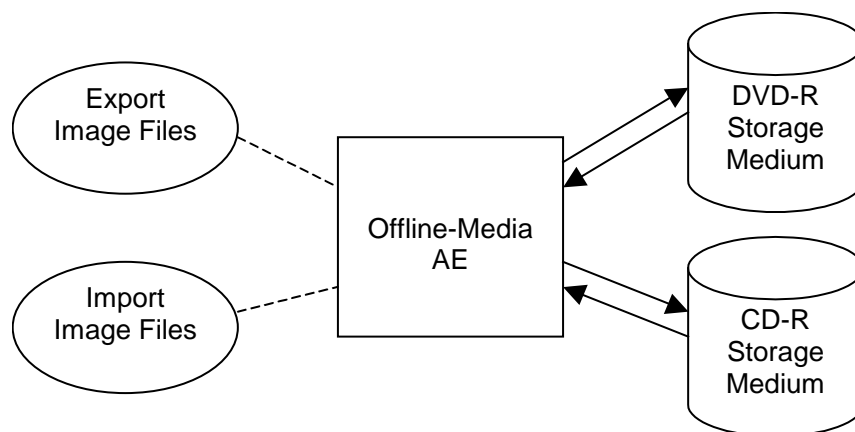
## 5.1.1 Application Data Flow



**Figure 5.1-1**
**APPLICATION DATA FLOW DIAGRAM FOR MEDIA STORAGE**

— The Offline-Media AE exports image files to a CD-R or a DVD-R Storage medium. It is associated with the local real-world activity "Export Image Files" performed upon user request.

— The Offline-Media AE imports image files from a CD-R or a DVD-R Storage medium. It is associated with the local real-world activity "Import Image Files" performed upon user request.

## 5.1.2 Functional Definition of AEs

## 5.1.2.1 Functional Definition of Offline-Media AE

The Offline-Media AE is performed upon user request for selected studies /series/images to/from an offline DICOM CD-R or DVD-R medium. It therefore performs the following tasks:

Export:
— Builds DICOM Information Objects.
— Creates a DICOMDIR file that represents the contents of the DICOM Information Objects to be recorded.
— Records DICOM Information Objects and the DICOMDIR file to the CD-R or the DVD-R medium.

Import:
— Reads the DICOMDIR file that represents the contents of the data as recorded.
— Displays the ordered list of studies/series/images, identifying information.
— Loads the selected studies/series/images from a CD-R or a DVD-R medium and displays them on the screen.

Note: The Offline-Media AE can update files created by the product itself.

### 5.1.3 Sequencing of Real-World Activities

#### 5.1.3.1 Activity - Export Image Files

##### 5.1.3.1.1 Activity-Export Image Files to CD-R

Operator requests to create new File-set(s) onto a new CD-R. The requests are placed in a queue and are executed in the background.

The operations for "Export Image Files" are described below:

Step-1: Select the instance(s), series or studies on the local storage device to be created to the CD-R medium.

Step-2: Select the image archiving.

Step-3: Select the Virtual CD device as a destination.

Step-4: Request to copy to the CD-R.

##### 5.1.3.1.2 Activity-Export Image Files to DVD-R

Operator requests to create File-set(s) onto a new DVD-R. The requests are placed in a queue and are executed in the background.

The operations for "Export Image Files" are described below:

Step-1: Select the instance(s), series or studies on the local storage device to be created to the DVD-R medium.

Step-2: Select the image archiving.

Step-3: Select the DVD device as a destination.

Step-4: Request to copy to the DVD-R.

#### 5.1.3.2 Activity - Import Image Files

Operator requests to retrieve File-set(s) on the CD-R or the DVD-R. The requests are placed in a queue and are executed in the background.

The operations for "Import Image Files" are described below:

Step-1: Select the XA image(s), series or studies on the medium to be retrieved to the local storage device.

Step-2: Select the data retrieval.

Step-3: Select the local storage device as a destination.

### 5.1.4 File Meta Information for Implementation Class and Version

The implementation information written to the File Meta Header in each file is:

**Table 5.1-1**
**DICOM IMPLEMENTATION CLASS AND VERSION FOR MEDIA STORAGE**

| File Meta Information Version | 1 |
|---|---|
| Implementation Class UID | 1.2.392.200036.9116.7.8.12.10.31.1.1 |
| Implementation Version Name | TM_INFINIX_V2.0 |

## 5.2 AE SPECIFICATIONS

### 5.2.1 Offline-Media AE Specification

The Offline-Media AE provides standard conformance to the DICOM Interchange Option of the Media Storage Service Class. The Application Profiles and roles are listed below:

**Table 5.2-1**
**APPLICATION PROFILES, ACTIVITIES AND ROLES FOR OFFLINE-MEDIA**

| Application Profiles Supported | Real World Activity | Role | SC Option |
|---|---|---|---|
| Basic Cardiac X-ray Angiographic Studies on CD-R media: STD-XABC-CD | Export Image Files | FSC | Interchange |
| Extended Cardiac X-ray Angiographic Studies on CD-R media: AUG-XABC-CD | | | |
| Basic Cardiac X-ray Angiographic Studies on CD-R media: STD-XABC-CD | Import Image Files | FSR | Interchange |
| Extended Cardiac X-ray Angiographic Studies on CD-R media: AUG-XABC-CD | | | |

In case of DVD-R medium, the Application Profiles described above are provisionally adopted.

### 5.2.1.1 File Meta Information for the Application Entity

The Offline-Media AE does not set the Source Application Entity Title.

### 5.2.1.2 Real-World Activities

#### 5.2.1.2.1 Activity – Export Image Files

The Offline-Media AE acts as an FSC using the interchange option when requested to export SOP Instances from the local database to a CD-R or a DVD-R medium.

#### 5.2.1.2.1.1 Media Storage Application Profiles

The Offline-Media AE supports the STD-XABC-CD and the AUG-XABC-CD Application Profile.

#### 5.2.1.2.1.1.1 Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in the Table below for the STD-XABC-CD, the AUG-XABC-CD Application Profile as an FSC.

**Table 5.2-2**
**IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR THE STD-XABC-CD AND THE AUG-XABC-CD PROFILE**

| Information Object Definition | SOP Class UID | Transfer Syntax | Transfer Syntax UID |
|---|---|---|---|
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Explicit VR Little Endian Uncompressed | 1.2.840.10008.1.2.1 |
| | | Jpeg Lossless | 1.2.840.10008.1.2.4.70 |

#### 5.2.1.2.2 Activity – Import Image Files

The Offline-Media AE acts as an FSR using the interchange option when requested to import SOP Instances from a CD-R or a DVD-R medium to the local database.

#### 5.2.1.2.2.1 Media Storage Application Profiles

The Offline-Media AE supports the STD-XABC-CD and the AUG-XABC-CD Application Profile.

#### 5.2.1.2.2.1.1 Options

The Offline-Media AE supports the SOP Classes and Transfer Syntaxes listed in the Table below for the STD-XABC-CD and the AUG-XABC-CD Application Profile as an FSR.

**Table 5.2-3**
**IODS, SOP CLASSES AND TRANSFER SYNTAXES FOR THE STD-XABC-CD AND THE AUG-XABC-CD PROFILE (FSR)**

| Information Object Definition | SOP Class UID | Transfer Syntax | Transfer Syntax UID |
|---|---|---|---|
| XA Image Storage | 1.2.840.10008.5.1.4.1.1.12.1 | Explicit VR Little Endian Uncompressed | 1.2.840.10008.1.2.1 |
| | | Jpeg Lossless | 1.2.840.10008.1.2.4.70 |

### 5.3 MEDIA CONFIGURATION

Not applicable to the Offline-Media AE.

# 6. SUPPORT OF CHARACTER SETS

This product supports the following character sets:

- ISO-IR 6 (default)　　　　　　ISO 646
- ISO-IR 100 (Latin alphabet No.1)　Supplementary set of ISO 8859
- ISO-IR 87 (Japanese)　　　　　JIS X 0208 (Kanji)
- ISO-IR 159 (Japanese)　　　　　JIS X 0212 (Supplementary Kanji)

Character sets ISO-IR 100, ISO-IR 87 and ISO-IR 159 can be set to the tags listed in the Table below;

**Table 6.1-1**
**Tag lists for ISO-IR 100/87/159**

| Attribute Name | Tag | VR |
|---|---|---|
| Referring Physician's Name | (0008,0090) | PN |
| Performing Physician's Name | (0008,1050) | PN |
| Name of Physician(s) Reading Study | (0008,1060) | PN |
| Operators' Name | (0008,1070) | PN |
| Patient's Name | (0010,0010) | PN |
| Patient Comments | (0010,4000) | LT |
| Contrast/Bolus Agent | (0018,0010) | LO |
| Contrast/Bolus Route | (0018,1040) | LO |
| Image Comments | (0020,4000) | LT |
| Requesting Service | (0032,1033) | LO |

Note:

If the Storage SCP AE receives images that contain characters from unsupported character sets, it will respond with "Cannot understand" to the C-STORE request.

If the Q/R SCP AE receives query requests that contain characters from unsupported character sets, it will respond with "Unable to process" to the C-FIND request.

If the Storage SCP AE receives images that contain characters from "ISO-IR 100", G1 characters can be replaced to any G0 characters. The mapping of the replacement is configured using the Service Tool. The Settings is performed by Toshiba Service Personnel at the time of installation of the product.

# 7. SECURTIY

This product does not support any specific security measures.

It is assumed that the product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

    a.  Firewall or router protections to ensure that only approved external hosts have network access to the product.

    b.  Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

    c.  Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

# 8. ANNEXES

## 8.1 IOD CONTENTS

### 8.1.1 Created SOP Instances

Table 8.1-1 specifies the attributes of a XA Image transmitted by the Storage SCU AE.

The following tables use a number of abbreviations. The abbreviations used in the "Presence of …" column are:

| | |
|---|---|
| VNAP | Value Not Always Present (attribute sent zero length if no value is present) |
| ANAP | Attribute Not Always Present |
| ALWAYS | Always Present |
| EMPTY | Attribute is sent without a value |

The abbreviations used in the "Source" column:

| | |
|---|---|
| MWL | the attribute value source Modality Worklist |
| USER | the attribute value source is from User input |
| AUTO | the attribute value is generated automatically |
| MPPS | the attribute value is the same as that use for Modality Performed Procedure Step |
| CONFIG | the attribute value source is a configurable parameter |

### 8.1.1.1 XA Image IOD

**Table 8.1-1**
**IOD OF CREATED XA IMAGE SOP INSTANCES**

| IE | Module | Reference | Presence of Module |
|---|---|---|---|
| Patient | Patient | Table 8.1-2 | ALWAYS |
| Study | General Study | Table 8.1-3 | ALWAYS |
| | Patient Study | Table 8.1-4 | ALWAYS |
| Series | General Series | Table 8.1-5 | ALWAYS |
| Equipment | General Equipment | Table 8.1-6 | ALWAYS |
| Image | General Image | Table 8.1-7 | ALWAYS |
| | Image Pixel | Table 8.1-8 | ALWAYS |
| | Contrast/Bolus | Table 8.1-9 | Only if contrast media was used in this image |
| | Cine | Table 8.1-10 | Only if DSA acquisition is performed |
| | Multi-frame | Table 8.1-11 | ALWAYS |
| | Frame Pointers | Table 8.1-12 | ALWAYS |
| | Display Shutter | Table 8.1-13 | Only if shutter was used in this image |
| | Device | Table 8.1-14 | Only if device data was used in this image |
| | X-ray Image | Table 8.1-15 | ALWAYS |
| | X-ray Acquisition | Table 8.1-16 | ALWAYS |
| | X-ray Table | Table 8.1-17 | ALWAYS |
| | X-ray Positioner | Table 8.1-18 | ALWAYS |
| | Curve | Table 8.1-19 | Only if curve data was used in this image |
| | VOI LUT | Table 8.1-20 | ALWAYS |

| | | |
|---|---|---|
| SOP Common | Table 8.1-21 | ALWAYS |

## 8.1.1.2   Common Modules

**Table 8.1-2**
**PATIENT MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Patient's Name | (0010,0010) | PN | From Modality Worklist or user input. Values supplied via Modality Worklist will be entered as received. Maximum 64 characters. | ALWAYS | MWL/ USER |
| Patient ID | (0010,0020) | LO | From Modality Worklist or user input. Maximum 64 characters. | ALWAYS | MWL/ USER |
| Patient's Birth Date | (0010,0030) | DA | From Modality Worklist or user input | VNAP | MWL/ USER |
| Patient's Sex | (0010,0040) | CS | From Modality Worklist or user input | ALWAYS | MWL/ USER |
| Patient Comments | (0010,4000) | LT | From User Input. Maximum 1024 characters. | ANAP | MWL/ USER |
| Other Patient IDs | (0010, 1000) | LO | From Modality Worklist or user input | ANAP | MWL/ USER |
| Other Patient Names | (0010, 1001) | PN | From Modality Worklist or user input | ANAP | MWL/ USER |
| Ethnic Group | (0010, 2160) | SH | From Modality Worklist or user input | ANAP | MWL/ USER |

**Table 8.1-3**
**GENERAL STUDY MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Study Instance UID | (0020,000D) | UI | From Modality Worklist or generated by device | ALWAYS | MWL/ AUTO |
| Study Date | (0008,0020) | DA | <yyyymmdd> | ALWAYS | AUTO |
| Study Time | (0008,0030) | TM | <hhmmss> | ALWAYS | AUTO |
| Referring Physician's Name | (0008,0090) | PN | From Modality Worklist | VNAP | MWL |
| Study ID | (0020,0010) | SH | Requested Procedure ID from Worklist or User Input | ALWAYS | MWL/ USER |
| Accession Number | (0008,0050) | SH | From Modality Worklist or user input | VNAP | MWL/ USER |
| Study Description | (0008,1030) | LO | User input | VNAP | USER |
| Physician(s) of Record | (0008,1048) | PN | User input | ANAP | USER |
| Name of Physician(s) Reading Study | (0008,1060) | PN | From Modality Worklist or user input | ANAP | MWL/ USER |

**Table 8.1-4**
**PATIENT STUDY MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Patient's Age | (0010,1010) | AS | Calculated from DoB input on base of actual Date | ALWAYS | AUTO |
| Patient's Size | (0010,1020) | DS | From Modality Worklist or user input | ANAP | MWL/ USER |
| Patient's Weight | (0010,1030) | DS | From Modality Worklist or user input | ANAP | MWL/ USER |
| Occupation | (0010,2180) | SH | From Modality Worklist or user input | VNAP | MWL/ USER |
| Additional Patient's History | (0010,21B0) | LT | From Modality Worklist or user input | ANAP | MWL/ USER |
| Referenced Study Component Sequence | (0008,1111) | SQ | | ALWAYS | AUTO |
| Referenced SOP Class UID | (0008,1150) | UI | | ALWAYS | AUTO |
| Referenced SOP Instance UID | (0008,1151) | UI | | ALWAYS | AUTO |

**Table 8.1-5**
**GENERAL SERIES MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Modality | (0008,0060) | CS | XA | ALWAYS | AUTO |
| Series Instance UID | (0020,000E) | UI | Generated by device | ALWAYS | AUTO |
| Series Number | (0020,0011) | IS | Generated by device | ALWAYS | AUTO |
| Series Date | (0008,0021) | DA | <yyyymmdd> | ALWAYS | AUTO |
| Series Time | (0008,0031) | TM | <hhmmss> | ALWAYS | AUTO |
| Performing Physician's Name | (0008,1050) | PN | user input | ANAP | USER |
| Protocol Name | (0018,1030) | LO | user input | VNAP | USER |
| Series Description | (0008,103E) | LO | user input | ANAP | USER |
| Operator's Name | (0008,1070) | PN | Operator field in Study list. Maximum 64 characters. | ANAP | USER |
| Body Part Examined | (0018,0015) | CS | user input | ANAP | USER |
| Performed Procedure Step ID | (0040,0253) | SH | | ANAP | AUTO |
| Performed Procedure Step Start Date | (0040,0244) | DA | <yyyymmdd> | ANAP | AUTO |
| Performed Procedure Step Start Time | (0040,0245) | TM | <hhmmss> | ANAP | AUTO |
| Performed Procedure Step Description | (0040,0254) | LO | | ANAP | AUTO |

**Table 8.1-6**
**GENERAL EQUIPMENT MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Manufacturer | (0008,0070) | LO | TOSHIBA_MEC | ALWAYS | AUTO |
| Institution Name | (0008,0080) | LO | From Configuration | ALWAYS | CONFIG |
| Institution Address | (0008,0081) | ST | | | |
| Station Name | (0008,1010) | SH | From Configuration | ALWAYS | CONFIG |
| Institution Department Name | (0008,1040) | LO | From Configuration | VNAP | CONFIG |
| Manufacturer's Model Name | (0008,1090) | LO | DFP-8000D | ALWAYS | AUTO |
| Device Serial Number | (0018,1000) | LO | From Configuration | VNAP | CONFIG |
| Software Version | (0018,1020) | LO | From Configuration | VNAP | CONFIG |

**Table 8.1-7**
**GENERAL IMAGE MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Image Number | (0020,0013) | IS | Generated by device | ALWAYS | AUTO |
| Content Date | (0008,0023) | DA | <yyyymmdd> | ALWAYS | AUTO |
| Content Time | (0008,0033) | TM | <hhmmss> | ALWAYS | AUTO |
| Image Type | (0008,0008) | CS | | ALWAYS | AUTO |
| Acquisition Number | (0020,0012) | IS | Generated by device | ALWAYS | AUTO |
| Acquisition Date | (0008,0022) | DA | <yyyymmdd> | ALWAYS | AUTO |
| Acquisition Time | (0008,0032) | TM | <hhmmss> | ALWAYS | AUTO |
| Referenced Image Sequence | (0008,1140) | SQ | | ANAP | AUTO |
| >Referenced SOP Class UID | (0008,1150) | UI | | ANAP | AUTO |
| >Referenced SOP Instance UID | (0008,1155) | UI | | ANAP | AUTO |
| Source Image Sequence | (0008,2112) | SQ | | ANAP | AUTO |
| >Referenced SOP Class UID | (0008,1150) | UI | | ANAP | AUTO |
| >Referenced SOP Instance UID | (0008,1150) | UI | | ANAP | AUTO |
| Image Comments | (0020,4000) | LT | From user input. Maximum 1024 characters. | VNAP | USER |
| Instance Creation Date | (0008,0012) | DA | <yyyymmdd> | ALWAYS | AUTO |
| Instance Creation Time | (0008,0013) | TM | | ALWAYS | AUTO |
| Instance Creator UID | (0008,0014) | UI | | ALWAYS | AUTO |

**Table 8.1-8**
**IMAGE PIXEL MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Samples per Pixel | (0028,0002) | US | 1 | ALWAYS | AUTO |
| Photometric Interpretation | (0028,0004) | CS | MONOCHROME2 | ALWAYS | AUTO |
| Rows | (0028,0010) | US | Generated by device | ALWAYS | AUTO |
| Columns | (0028,0011) | US | Generated by device | ALWAYS | AUTO |
| Bits Allocated | (0028,0100) | US | Generated by device | ALWAYS | AUTO |
| Bits Stored | (0028,0101) | US | Generated by device | ALWAYS | AUTO |
| High Bit | (0028,0102) | US | Generated by device | ALWAYS | AUTO |
| Pixel Representation | (0028,0103) | US | 0 | ALWAYS | AUTO |
| Pixel Data | (7FE0,0010) | OB | Generated by device | ALWAYS | AUTO |

**Table 8.1-9**
**CONTRAST/BOLUS MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Contrast/Bolus Agent | (0018,0010) | LO | | VNAP | USER |
| Contrast/Bolus Route | (0018,1040) | LO | | ANAP | USER |
| Contrast/Bolus Volume | (0018,1041) | DS | | ANAP | AUTO |
| Contrast/Bolus Start Time | (0018,1042) | TM | | ANAP | AUTO |
| Contrast/Bolus Stop Time | (0018,1043) | TM | | ANAP | AUTO |
| Contrast Flow Rate(s) | (0018,1046) | DS | | ANAP | AUTO |
| Contrast Flow Duration(s) | (0018,1047) | DS | | ANAP | AUTO |
| Contrast/Bolus Ingredient | (0018,1048) | CS | | ANAP | AUTO |
| Contrast/Bolus Ingredient Concentration | (0018,1049) | DS | | ANAP | AUTO |

**Table 8.1-10**
**CINE MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Frame Time | (0018,1063) | DS | Set when DA acquisition or fluoroscopy recording is performed | ANAP | AUTO |
| Frame Time Vector | (0018,1065) | DS | | ALWAYS | AUTO |
| Recommended Display Frame Rate | (0008,2144) | IS | | ALWAYS | AUTO |

**Table 8.1-11**
**MULTI FRAME MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Number of Frames | (0028,0008) | IS | | ALWAYS | AUTO |
| Frame Incremental Pointer | (0028,0009) | AT | 0x00181063/0x00181065 | ALWAYS | AUTO |

**Table 8.1-12**
**FRAME POINTERS MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Representative Frame Number | (0028,6010) | US | | ALWAYS | AUTO |

**Table 8.1-13**
**DISPLAY SHUTTER MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Shutter Shape | (0018,1600) | CS | RECTANGULAR | ANAP | USER |
| Shutter Left Vertical Edge | (0018,1602) | IS | | ANAP | USER |
| Shutter Right Vertical Edge | (0018,1604) | IS | | ANAP | USER |
| Shutter Upper Horizontal Edge | (0018,1606) | IS | | ANAP | USER |
| Shutter Lower Horizontal Edge | (0018,1608) | IS | | ANAP | USER |

**Table 8.1-14**
**DEVICE MODULE OF CREATED SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Device Sequence | (0050,0010) | SQ | | ANAP | AUTO |
| >Device Length | (0050,0014) | DS | | ANAP | AUTO |
| >Device Diameter | (0050,0016) | DS | | ANAP | AUTO |
| >Device Volume | (0050,0018) | DS | | ANAP | AUTO |
| >Inter-marker Distance | (0050,0019) | DS | | ANAP | AUTO |
| >Device Description | (0050,0020) | LO | | ANAP | AUTO |

### 8.1.1.3 XA Image Modules

**Table 8.1-15**
**X-RAY IMAGE MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Frame Increment Pointer | (0028,0009) | DS | | ALWAYS | AUTO |
| Image Type | (0008,0008) | DS | | ALWAYS | AUTO |
| Pixel Intensity Relationship | (0028,1040) | DS | DISP/LIN | ALWAYS | AUTO |
| Samples per Pixel | (0028,0002) | DS | 1 | ALWAYS | AUTO |
| Photometric Interpretation | (0028,0004) | DS | MONOCHROME2 | ALWAYS | AUTO |
| Bits Allocated | (0028,0100) | US | | ALWAYS | AUTO |
| Bits Stored | (0028,0101) | US | | ALWAYS | AUTO |
| High Bit | (0028,0102) | US | | ALWAYS | AUTO |
| Pixel Representation | (0028,0103) | US | 0 | ALWAYS | AUTO |
| Reference Image Sequence | (0008,1140) | SQ | | ALWAYS | AUTO |
| >Reference SOP Class UID | (0008,1150) | UI | | ALWAYS | AUTO |
| >Reference SOP Instance UID | (0008,1155) | UI | | ALWAYS | AUTO |

**Table 8.1-16**
**X-RAY ACQUISITION MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| KVP | (0018, 0060) | DS | | ALWAYS | AUTO |
| Radiation Setting | (0018, 1155) | CS | | ALWAYS | AUTO |
| X-Ray Tube Current | (0018, 1151) | IS | | ALWAYS | AUTO |
| Exposure Time | (0018, 1150) | IS | | ALWAYS | AUTO |
| Intensifier Size | (0018, 1162) | DS | | ALWAYS | AUTO |
| Average Pulse Width | (0018, 1154) | DS | | ALWAYS | AUTO |
| Field of View Shape | (0018, 1147) | CS | ROUND/RECTANGLE | ALWAYS | AUTO |
| Field of View Dimension(s) | (0018, 1149) | IS | | ALWAYS | AUTO |
| Imager Pixel Spacing | (0018, 1164) | DS | | ALWAYS | AUTO |
| Image Area Dose Product | (0018, 115E) | DS | | ANAP | AUTO |
| Focal Spot(s) | (0018, 1190) | DS | | ALWAYS | AUTO |

**Table 8.1-17**
**TABLE MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Table Motion | (0018, 1134) | CS | STATIC/DYNAMIC | ALWAYS | AUTO |
| Table Vertical Increment | (0018, 1135) | DS | Set when Table Motion is DYNAMIC | VNAP | AUTO |
| Table Longitudinal Increment | (0018, 1137) | DS | Set when Table Motion is DYNAMIC | VNAP | AUTO |
| Table Lateral Increment | (0018, 1136) | DS | Set when Table Motion is DYNAMIC | VNAP | AUTO |
| Table Angle | (0018, 1138) | DS | | ANAP | AUTO |

**Table 8.1-18**
**POSITIONER MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Distance Source to Patient | (0018, 1111) | DS | | ALWAYS | AUTO |
| Distance Source to Detector | (0018, 1110) | DS | | ALWAYS | AUTO |
| Estimated Radiographic Magnification Factor | (0018, 1114) | DS | | ANAP | AUTO |
| Positioner Motion | (0018, 1500) | CS | STATIC/DYNAMIC | ALWAYS | AUTO |
| Positioner Primary Angle | (0018, 1510) | DS | | ALWAYS | AUTO |
| Positioner Secondary Angle | (0018, 1511) | DS | | ALWAYS | AUTO |
| Positioner Primary Angle Increment | (0018, 1520) | DS | Set when Positioner Motion is DYNAMIC | ANAP | AUTO |
| Positioner Secondary Angle Increment | (0018, 1521) | DS | Set when Positioner Motion is DYNAMIC | ANAP | AUTO |

**Table 8.1-19**
**CURVE MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Curve Dimensions | (50xx, 0005) | US | | ANAP | AUTO |
| Number of Points | (50xx, 0010) | US | | ANAP | AUTO |
| Type of Data | (50xx, 0020) | CS | | ANAP | AUTO |
| Data Value Representation | (50xx, 0103) | US | | ANAP | AUTO |
| Curve Data | (50xx, 3000) | OW | | ANAP | AUTO |
| Axis Units | (50xx, 0030) | SH | | ANAP | AUTO |
| Curve Data Descriptor | (50xx, 0110) | US | | ANAP | AUTO |
| Coordinate Start Value | (50xx, 0112) | US | | ANAP | AUTO |
| Coordinate Step Value | (50xx, 0114) | US | | ANAP | AUTO |

**Table 8.1-20**

**VOI/LUT MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| VOI LUT Sequence | (0028,3010) | SQ | | ANAP | AUTO |
| >LUT descriptor | (0028,3002) | SS | Set when VOI LUT Sequence is present | ANAP | AUTO |
| >LUT Explanation | (0028,3003) | LO | | ANAP | AUTO |
| >LUT Data | (0028,3006) | OB | Set when VOI LUT Sequence is present | ANAP | AUTO |

**Table 8.1-21**
**SOP COMMON MODULE OF CREATED XA IMAGE SOP INSTANCES**

| Attribute Name | Tag | VR | Value | Presence of Value | Source |
|---|---|---|---|---|---|
| Specific Character set | (0008,0008) | CS | Refer to 6 | ANAP | CONFIG |
| SOP Class UID | (0008,0016) | UI | 1.2.840.10008.5.1.4.1.1.12.1 | ALWAYS | AUTO |
| SOP Instance UID | (0008,0018) | UI | Generated by device | ALWAYS | AUTO |

## 8.1.2  X-Ray Radiation Dose SR SOP Class

The X-Ray Radiation Dose SRs implementing TID 10001 Projection X-Ray Radiation Dose is created.
For every single irradiation event an entry is made into the SR. The scope of accumulation is "Study".
All patient level, study level and equipment information is taken from the acquired images of the related
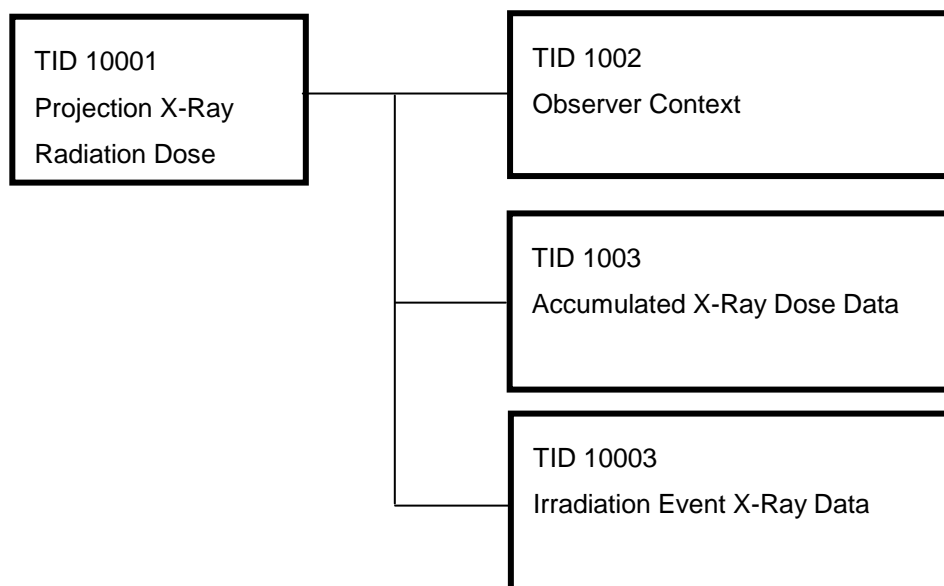procedure.



**Figure 8.1-1**
**X-RAY RADIATION DOSE SR IOD STRUCTURE**

**Table 8.1-22**

**TID10001**

**PROJECTION X-RAY RADIATION DOSE**

**Type: Extensible**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | CONTAINER | EV (113701, DCM, "X-Ray Radiation Dose Report") | 1 | M | | |
| 2 | > | HAS CONCEPT MOD | CODE | EV (121058, DCM, "Procedure reported") | 1 | M | | DT (113704, DCM, "Projection X-Ray") |
| 3 | >> | HAS CONCEPT MOD | CODE | EV (G-C0E8, SRT, "Has Intent") | 1 | M | | DCID (3629) Procedure Intent |
| 4 | > | | INCLUDE | DTID (1002) Observer Context | 1-n | M | | |
| 5 | > | HAS OBS CONTEXT | CODE | EV (113705, DCM, "Scope of Accumulation") | 1 | M | | DCID (10000) Scope of Accumulation |
| 6 | >> | HAS PROPERTIES | UIDREF | DCID (10001) UID Types | 1 | M | | |
| 7 | > | CONTAINS | INCLUDE | DTID (10002) Accumulated X-Ray Dose | 1 | MC | IFF Single Plane system | $Plane = EV (113622, DCM, "Single Plane" |
| 8 | > | CONTAINS | INCLUDE | DTID (10002) Accumulated X-Ray Dose | 1 | MC | IFF Biplane system | $Plane = EV (113620, DCM, "Plane A") |
| 9 | > | CONTAINS | INCLUDE | DTID (10002) Accumulated X-Ray Dose | 1 | MC | IFF Biplane system | $Plane = EV (113621, DCM, "Plane B") |
| 10 | > | CONTAINS | INCLUDE | DTID (10003) Irradiation Event X-Ray Data | 1-n | M | | |
| 14 | > | CONTAINS | CODE | EV (113854, DCM, "Source of Dose Information") | 1-n | M | | DCID (10020) Source of Projection X-Ray Dose Information |

**Table 8.1-23**

**TID1002**

**OBSERVER CONTEXT**

**Type: Non-Extensible**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | HAS OBS CONTEXT | CODE | EV (121005,DCM, "Observer Type") | 1 | MC | IF Observer type is device | DCID (270) Observer Type |
| 3 | | HAS OBS CONTEXT | INCLUDE | DTID (1004) Device observer identifying attributes | 1 | MC | IFF Row 1 value = (121007,DCM, "Device") | |

**Table 8.1-24**

**TID 1004**

**DEVICE OBSERVER IDENTIFYING ATTRIBUTES**

**Type: Extensible**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | UIDREF | EV (121012,DCM, "Device Observer UID") | 1 | M | | 1.2.392.200036.9116.3.1+Device Serial Number |
| 3 | | | TEXT | EV (121014,DCM, "Device Observer Manufacturer") | 1 | U | | TOSHIBA_MEC |
| 4 | | | TEXT | EV (121015,DCM, "Device Observer Model Name") | 1 | U | | Same as (0008,1090) Manufacturer's Model Name |
| 5 | | | TEXT | EV (121016,DCM, "Device Observer Serial Number") | 1 | U | | Same as (0018,1000) Device Serial Number |

**Table 8.1-25**

**TID 10002**

**ACCUMULATED X-RAY DOSE**

**Type: Extensible**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | CONTAINER | EV (113702, DCM, "Accumulated X-Ray Dose Data") | 1 | M | | |
| 2 | > | HAS CONCEPT MOD | CODE | EV (113764, DCM, "Acquisition Plane" | 1 | M | | DCID (10003) Equipment Plane Identification |
| 9 | > | CONTAINS | INCLUDE | DTID (10004) Accumulated Projection X-Ray Dose | 1 | MC | XOR row 11, IFF TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") | |

**Table 8.1-26**

**TID 10003**

**IRRADIATION EVENT X-RAY DATA**

**Type: Extensible**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | CONTAINER | EV (113706, DCM, "Irradiation Event X-Ray Data") | 1 | M | | |
| 2 | > | HAS CONCEPT MOD | CODE | EV (113764, DCM, "Acquisition Plane") | 1 | M | | DCID (10003) Equipment Plane Identification |
| 3 | > | CONTAINS | DATETIME | DT (111526, DCM, "DateTime Started") | 1 | M | | X-ray starting time is setted. <hhmmss> |
| 4 | > | CONTAINS | CODE | EV (113721, DCM, "Irradiation Event Type") | 1 | M | | DCID (10002) Irradiation Event Types |
| 8 | > | CONTAINS | TEXT | EV (113780, DCM, "Reference Point Definition") | 1 | MC | IF Row 13 or Row 14 is present and Row 9 is not present | If option is enabled, DCID (10025) Radiation Dose Reference Points<br><br>If option is disabled, Text is set. ("5cm from 10cm above Tabletop toward Source/5cm from Isocenter toward Source /5cm from 10cm above Tabletop toward Source (PA)") |
| 10 | > | CONTAINS | UIDREF | EV (113769, DCM, "Irradiation Event UID") | 1 | M | | Fluoroscopy: StudyInstanceUID<.>1<.>Create Time(hhmmss): Radiography: StudyInstanceUID<.>0<.>Create Time(hhmmss) |
| 11 | > | CONTAINS | NUM | EV (122130, DCM, "Dose Area Product") | 1 | MC | IFF TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") | Units = EV (Gym2, UCUM, "Gy.m2") |
| 13 | > | CONTAINS | NUM | EV (113738, DCM, "Dose (RP)") | 1 | MC | IFF TID (10001) Row 2 = (113704, DCM, "Projection X-Ray") AND any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content") | Units = EV (Gy, UCUM, "Gy") |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 15 | > | CONTAI NS | NUM | EV (112011, DCM, "Positioner Primary Angle") | 1 | UC | XOR Row 19 | Units = EV (deg, UCUM, "0") |
| 16 | > | CONTAI NS | NUM | EV ( 112012, DCM, "Positioner Secondary Angle") | 1 | UC | XOR Row 19 | Units = EV (deg, UCUM, "0") |
| 17 | > | CONTAI NS | NUM | EV (113739, DCM, "Positioner Primary End Angle" | 1 | UC | IFF Row 4 value = (113613, DCM, "Rotational Acquisition") | Units = EV (deg, UCUM, "0") |
| 18 | > | CONTAI NS | NUM | EV (113740, DCM, "Positioner Secondary End Angle" | 1 | UC | IFF Row 4 value = (113613, DCM, "Rotational Acquisition") | Units = EV (deg, UCUM, "0") |
| 20 | > | CONTAI NS | NUM | EV (113790, DCM, "Collimated Field Area" | 1 | U | | Units = EV (m2, UCUM, "m^2") |
| 21 | > | CONTAI NS | CONTAIN ER | EV (113771, DCM, "X-Ray Filters") | 1-n | U | | |
| 22 | >> | CONTAI NS | CODE | EV (113772, DCM, "X-Ray Filter Type") | 1 | U | | DCID (10007) X-Ray Filter Types |
| 23 | >> | CONTAI NS | CODE | EV (113757, DCM, "X-Ray Filter Material") | 1 | U | | DCID (10006) X-Ray Filter Materials |
| 24 | >> | CONTAI NS | NUM | EV (113758, DCM, "X-Ray Filter Thickness Minimum") | 1 | U | | Units = EV (mm, UCUM, "mm") |
| 25 | >> | CONTAI NS | NUM | EV (113773, DCM, "X-Ray Filter Thickness Maximum") | 1 | U | | Units = EV (mm, UCUM, "mm") same as Filter Thickness Minimum |
| 26 | > | CONTAI NS | CODE | EV (113732, DCM, "Fluoro Mode") | 1 | UC | IFF Row 3 value = (P5-06000, SRT, "Fluoroscopy") | DCID (10004) Fluoro Modes |
| 27 | > | CONTAI NS | NUM | EV (113791, DCM, "Pulse Rate") | 1 | MC | IFF Row 26 value = (113631, DCM, "Pulsed") | Units = EV ({pulse}/s, UCUM, "pulse/s") |
| 28 | > | CONTAI NS | NUM | EV (113768, DCM, "Number of Pulses") | 1 | MC | IFF Row 26 value = (113631, DCM, "Pulsed") | Units = EV (1, UCUM, "no units") |
| 29 | >> | HAS CONCE PT MOD | CODE | EV (121401, DCM, "Derivation") | 1 | MC | IFF count of pulses in Row 28 is estimated | EV (R-10260, SRT, "Estimated") |
| 30 | > | CONTAI NS | NUM | EV (113733, DCM, "KVP") | 1-n | U | | Units = EV (kV, UCUM, "kV") |

| 31 | > | CONTAINS | NUM | EV (113734, DCM, "X-Ray Tube Current") | 1-n | U | | Units = EV (mA, UCUM, "mA") |
|---|---|---|---|---|---|---|---|---|
| 32 | > | CONTAINS | NUM | EV (113735, DCM, "Exposure Time") | 1 | U | | Units = EV (ms, UCUM, "ms") |
| 33 | > | CONTAINS | NUM | EV (113793, DCM, "Pulse Width") | 1-n | U | | Units = EV (ms, UCUM, "ms") |
| 35 | > | CONTAINS | NUM | EV (113766, DCM, "Focal Spot Size") | 1 | U | | Units = EV (mm, UCUM, "mm") |
| 41 | > | CONTAINS | NUM | DCID (10008) Dose Related Distance Measurements | 1-n | U | | Units = EV (mm, UCUM, "mm") |
| 42 | > | CONTAINS | NUM | EV (113754, DCM, "Table Head Tilt Angle") | 1 | U | | Units = EV (deg, UCUM, "0") |
| 43 | > | CONTAINS | NUM | EV (113755, DCM, "Table Horizontal Rotation Angle") | 1 | U | | Units = EV (deg, UCUM, "0") |
| 44 | > | CONTAINS | NUM | EV (113756, DCM, "Table Cradle Tilt Angle") | 1 | U | | Units = EV (deg, UCUM, "0") |
| 45 | > | CONTAINS | CODE | EV (123014, DCM, ("Target Region") | 1 | M | | DCID (4031) Common Anatomic Regions |
| 54 | > | CONTAINS | IMAGE | EV (113795, DCM, "Acquired Image") | 1-n | MC | IFF Image Object is created for this irradiation event | Same as SOP Instance UID |

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**Table 8.1-27**

**TID 10004**

**ACCUMULATED PROJECTION X-RAY DOSE**
**Type: Extensible**

| | NL | Rel with Parent | VT | Concept Name | VM | Req Type | Condition | Value Set Constraint |
|---|---|---|---|---|---|---|---|---|
| 1 | | | NUM | EV (113722, DCM, "Dose Area Product Total") | 1 | M | | Units = EV (Gym2, UCUM, "Gym2") |
| 2 | | | NUM | EV (113725, DCM, "Dose (RP) Total") | 1 | MC | IF any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content").   May be present otherwise. | Units = EV (Gym2, UCUM, "Gym2") |
| 3 | | | NUM | EV (113726, DCM, "Fluoro Dose Area Product Total") | 1 | MC | IFF TID(10003) Row 3 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event | Units = EV (Gym2, UCUM, "Gym2") |
| 4 | | | NUM | EV (113728, DCM, "Fluoro Dose (RP) Total") | 1 | MC | IFF TID(10003) Row 3 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event AND any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content"). | Units = EV (Gy, UCUM, "Gy") |
| 5 | | | NUM | EV (113730, DCM, "Total Fluoro Time") | 1 | MC | IFF TID(10003) Row 3 value = (P5-06000, SRT, "Fluoroscopy") for at least one irradiation event. | Units = EV (s, UCUM, "s") |
| 6 | | | NUM | EV (113727, DCM, "Acquisition Dose Area Product Total") | 1 | M | | Units = EV (Gym2, UCUM, "Gym2") |
| 7 | | | NUM | EV (113729, DCM, "Acquisition Dose (RP) Total") | 1 | MC | IF any of the values of TID (10001) Row 14 are not (113858, DCM, "MPPS Content").   May be present otherwise. | Units = EV (Gy, UCUM, "Gy") |
| 8 | | | NUM | EV (113855, DCM, "Total Acquisition Time") | 1 | M | | Units = EV (s, UCUM, "s") |

| 11 | | | TEXT | EV (113780, DCM, "Reference Point Definition") | 1 | MC | IF Row 2, Row 4 or Row 7 is present and Row 10 is not present. | If option is enabled,<br><br>DCID (10025) Radiation<br><br>Dose Reference Points<br><br><br>If option is disabled,<br><br>Text is set. ("5cm from 10cm above Tabletop toward Source/5cm from Isocenter toward Source /5cm from 10cm above Tabletop toward Source (PA)") |

**Table 8.1-28**

**Context ID 270**

**Observer Type**

**Type: Non-Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|:---:|:---:|:---|
| DCM | 121007 | Device |

**Table 8.1-29**

**Context ID 3629**

**Procedure Intent**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|:---:|:---:|:---|
| SRT | R-408C3 | Diagnostic Intent |
| SRT | R-41531 | Therapeutic Intent |
| SRT | R-002E9 | Combined Diagnostic and Therapeutic Procedure |

**Table 8.1-30**
**Context ID 4031**

**Common Anatomic Regions**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| SRT | T-D4000 | Abdomen |
| SRT | T-15750 | Ankle joint |
| SRT | T-D8200 | Arm |
| SRT | T-04000 | Breast |
| SRT | T-11501 | Cervical spine |
| SRT | T-D3000 | Chest |
| SRT | T-12310 | Clavicle |
| SRT | T-11BF0 | Coccyx |
| SRT | T-D8300 | Elbow |
| SRT | T-D0010 | Entire body |
| SRT | T-D0300 | Extremity |
| SRT | T-D9700 | Foot |
| SRT | T-D8700 | Hand |
| SRT | T-D1100 | Head |
| SRT | T-32000 | Heart |
| SRT | T-15710 | Hip joint |
| SRT | T-D9200 | Knee |
| SRT | T-D9400 | Leg |
| SRT | T-11503 | Lumbar spine |
| SRT | T-D1600 | Neck |
| SRT | T-D6000 | Pelvis |
| SRT | T-11AD0 | Sacrum |
| SRT | T-D2220 | Shoulder |
| SRT | T-11100 | Skull |
| SRT | T-11502 | Thoracic spine |

**Table 8.1-31**

**Context ID 10000**

**Scope of Accumulation**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113014 | Study |

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**Table 8.1-32**

**Context ID 10002**

**Irradiation Event Types**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| SRT | P5-06000 | Fluoroscopy |
| DCM | 113611 | Stationary Acquisition |
| DCM | 113612 | Stepping Acquisition |
| DCM | 113613 | Rotational Acquisition |

**Table 8.1-33**

**Context ID 10003**

**Equipment Plane Identification**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113620 | Plane A |
| DCM | 113621 | Plane B |
| DCM | 113622 | Single Plane |

**Table 8.1-34**

**Context ID 10004**

**Fluoro Modes**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113630 | Continuous |
| DCM | 113631 | Pulsed |

**Table 8.1-35**

**Context ID 10006**

**X-Ray Filter Materials**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| SRT | C-120F9 | Aluminum or Aluminum compound |
| SRT | C-127F9 | Copper or Copper compound |
| SRT | C-156F9 | Tantalum or Tantalum compound |

**Table 8.1-36**

**Context ID 10007**

**X-Ray Filter Types**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113650 | Strip filter |

**Table 8.1-37**

**Context ID 10008**

**Dose Related Distance Measurements**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113750 | Distance Source to Detector |
| DCM | 113753 | Table Height Position |

**Table 8.1-38**

**Context ID 10020**

**Source of Projection X-Ray Dose Information**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113856 | Automated Data Collection |

**Table 8.1-39**

**Context ID 10025**

**Radiation Dose Reference Points**

**Type: Extensible**

| Coding Scheme Designator (0008,0102) | Code Value (0008,0100) | Code Meaning (0008,0104) |
|---|---|---|
| DCM | 113860 | 15cm from Isocenter toward Source |

### 8.1.3  Usage of Attributes from received IOD's

No SOP Class specific fields are required.

### 8.1.4  Attribute Mapping

The tables below show the relationships between attributes received via Modality Worklist, stored in acquired images and communicated via MPPS.
The cell content conventions should be read as follows:

| | |
|---|---|
| Copy: | The value will be copied from a corresponding source attribute of another DICOM object, as defiend by the table column. |
| Copy from: <DICOM attribute>: | The source as specified in the referenced DICOM attribute will be used instead of using the DICOM attribute of the same row as the source. |
| Equal (internally generated): | The value will be internally generated which may be used in more than one DICOM object. |

**Table 8.1-40**
**SCHEDULED CASE - ATTRIBUTE MAPPING BETWEEN MODALITY WORKLIST, IMAGE AND MPPS**

| Attribute Name | Tag | Modality Worklist | Image IOD | | MPPS IOD | |
|---|---|---|---|---|---|---|
| Study Instance UID | (0020,000D) | Source | Copy | | Scheduled Step Attributes Sequence (0040,0270) | Copy |
| Referenced Study Sequence | (0008,1110) | Source | Copy | | | Copy |
| Accession Number | (0008,0050) | Source | Copy | | | Copy |
| Requested Procedure Description | (0032,1060) | Source | Copy | | | Copy |
| Requested Procedure ID | (0040,1001) | Source | Request Attributes Sequence (0040,0275) | Copy | | Copy |
| Scheduled Procedure Step ID | (0040,0009) | Source | | Copy | | Copy |
| Scheduled Procedure Step Description | (0040,0007) | Source | | Copy | | Copy |
| Scheduled Protocol Code Sequence | (0040,0008) | Source | | Copy | | Copy |
| Performed Protocol Code Sequence | (0040,0260) | - | Equal (internally generated). | | Equal (internally generated). | |
| Study ID | (0020,0010) | - | Copy from: Requested Procedure ID (0040,1001). | | Copy from: Requested Procedure ID (0040,1001). | |
| Performed Procedure Step ID | (0040,0253) | - | Equal (internally generated). | | Equal (internally generated). | |
| Performed Procedure Step Start Date | (0040,0244) | - | Equal (internally generated). | | Equal (internally generated). | |
| Performed Procedure Step Start Time | (0040,0245) | - | - | | Equal (internally generated). | |

| Attribute Name | Tag | | Image IOD | | MPPS IOD | |
|---|---|---|---|---|---|---|
| Performed Procedure Step Description | (0040,0254) | - | Copy from: Scheduled Procedure Step Description (0040,0007). | | Copy from: Scheduled Procedure Step Description (0040,0007). | |
| Requested Procedure Code Sequence | (0032,1064) | Value will be used for Procedure Code Sequence as specified below. | - | | - | |
| Procedure Code Sequence | (0008,1032) | - | Copy from: Requested Procedure Code Sequence (0032,1064). | | Copy from: Requested Procedure Code Sequence (0032,1064). | |
| Referenced SOP Class UID | (0008,1150) | Source | Referenced PPS Sequence (0008,1111) | 1.2.840.10008.3.1.2.3.3 | Copy | |
| Referenced SOP Instance UID | (0008,1155) | Source | Referenced PPS Sequence (0008,1111) | Equal to SOP Instance of the associated MPPS. | Copy | |
| Scheduled Performing Physician's Name | (0040,0006) | Value will be used for Performing Physician's Name as specified below. | - | | - | |
| Performing Physician's Name | (0008,1050) | - | Copy from: Scheduled Performing Physician's Name (0040,0006). | | Performed Series Sequence (0040,0340) | Copy from: Scheduled Performing Physician's Name (0040,0006). |
| Protocol Name | (0018,1030) | - | Equal (internally generated). | | | Equal (internally generated). |

**Table 8.1-41**
**UNSCHEDULED CASE - ATTRIBUTE MAPPING BETWEEN IMAGE AND MPPS**

| Attribute Name | Tag | Image IOD | | MPPS IOD | |
|---|---|---|---|---|---|
| Study Instance UID | (0020,000D) | Equal (internally generated). | | | Equal (internally generated). |
| Referenced Study Sequence | (0008,1110) | - | | Scheduled Step Attributes Sequence (0040,0270) | Zero Length |
| Accession Number | (0008,0050) | Equal (internally generated). | | | Zero Length |
| Requested Procedure Description | (0032,1060) | - | | | Zero Length |
| Requested Procedure ID | (0040,1001) | Request Attributes Sequence (0040,0275) | - | | Zero Length |
| Scheduled Procedure Step ID | (0040,0009) | | - | | Zero Length |
| Scheduled Procedure Step Description | (0040,0007) | | - | | Zero Length |
| Scheduled Protocol Code Sequence | (0040,0008) | | - | | Zero Length |
| Performed Protocol Code Sequence | (0040,0260) | - | | Zero Length | |

| Study ID | (0020,0010) | Equal (internally generated). | | Equal (internally generated). | |
|---|---|---|---|---|---|
| Performed Procedure Step ID | (0040,0253) | Zero Length | | - | |
| Performed Procedure Step Start Date | (0040,0244) | - | | Equal (internally generated). | |
| Performed Procedure Step Start Time | (0040,0245) | - | | Equal (internally generated). | |
| Performed Procedure Step Description | (0040,0254) | - | | Zero Length | |
| Requested Procedure Code Sequence | (0032,1064) | - | | - | |
| Procedure Code Sequence | (0008,1032) | - | | Zero Length | |
| Referenced SOP Class UID | (0008,1150) | Referenced PPS Sequence (0008,1111) | 1.2.840.10008.3.1.2.3.3 | - | |
| Referenced SOP Instance UID | (0008,1155) | | Equal to SOP Instance of the associated MPPS. | - | |
| Performing Physician's Name | (0008,1050) | - | | Performed Series Sequence (0040,0340) | Zero Length |
| Protocol Name | (0018,1030) | Equal (internally generated). | | | Equal (internally generated). |

## 8.1.5  Coerced/Modified Fields

Not applicable to this product

## 8.2    DATA DICTIONARY OF PRIVATE ATTRIBUTES

This product reserves blocks of private attributes in groups 0029 and 7079.
The Private Attributes added to created SOP Instances are listed in the Table below. Further details on usage of these private attributes are contained in Section 8.1.

**Table 8.2-1**
**DATA DICTIONARY OF PRIVATE ATTRIBUTES**

| Tag | Attribute Name | VR | VM |
|---|---|---|---|
| (0029,00xx) | Private Creator Code | LO | 1 |
| (0029,xx08) | Data | CS | 1-n |
| (0029,xx09) | Data | LO | 1-n |
| (0029,xx10) | Data | LO | 1-n |
| (0029,xx31) | Data | LO | 1-n |
| (0029,xx32) | Data | UL | 1-n |
| (0029,xx33) | Data | UL | 1-n |
| (0029,xx34) | Data | CS | 1-n |
| | | | |
| (7079,00xx) | Private Creator Code | LO | 1 |
| (7079,xx21) | Image Attribute Flag | SH | 5 |

| (7079,xx22) | Playback Speed | IS | 2 |
|---|---|---|---|
| (7079,xx23) | Frame Information | IS | 2 |
| (7079,xx24) | Injection Time | DS | 1 |
| (7079,xx25) | Calibration Status | SH | 1 |
| (7079,xx26) | Pixel Size | DS | 2 |
| (7079,xx27) | Mask Frame Range | US | 2 |
| (7079,xx28) | Contrast Stage Number | US | 1 |
| (7079,xx29) | Contrast Frame Range | US | 10 |
| (7079,xx2A) | Original Image Attribute | US | 5 |
| (7079,xx2C) | Section Status | SH | 3 |
| (7079,xx2D) | Section Frame Range | SS | 2 |
| (7079,xx2E) | External Trigger Playback | SH | 1 |
| (7079,xx2F) | Stage Specific Section | SH | 1 |
| (7079,xx30) | Contrast Stage Number | US | 1 |
| (7079,xx31) | Contrast Frame Table | US | 1-n |
| (7079,xx32) | Remask Status | SH | 2 |
| (7079,xx33) | Mask Frame Table | US | 1-n |
| (7079,xx34)* | Pixel Shift Status | SH | 2 |
| (7079,xx35)* | Pixel Shift Area | SH | 8 |
| (7079,xx36)* | Pixel Shift ROI Shape | SH | 8 |
| (7079,xx37)* | Pixel Shift ROI Area | US | 32 |
| (7079,xx38) | Pixel Shift X | SS | 1-n |
| (7079,xx39) | Pixel Shift Y | SS | 1-n |
| (7079,xx3A) | Mask/Contrast Average | US | 2 |
| (7079,xx3B) | Zoom Status | SH | 1 |
| (7079,xx3C) | Zoom Factor | DS | 3 |
| (7079,xx3D)* | Roaming | SS | 2 |
| (7079,xx3E) | Subtraction Status | SH | 1 |
| (7079,xx3F) | Mask Frame | US | 2 |
| (7079,xx40) | Subtraction Type | SH | 2 |
| (7079,xx41) | Landmark Coefficient | SS | 2 |
| (7079,xx42) | Cardiac Subtraction Status | SH | 1 |
| (7079,xx43) | TID Status | SH | 1 |
| (7079,xx44) | TID Interval | US | 1 |
| (7079,xx45) | Rotation Status | SH | 1 |
| (7079,xx46)* | Rotation Angle | SS | 2 |
| (7079,xx47) | Window Information | SS | 18 |
| (7079,xx48) | Spatial Filter Information | SS | 12 |
| (7079,xx49) | Auto Window Status | US | 3 |
| (7079,xx4A) | Test Exposure Coefficient | US | 1 |
| (7079,xx4B)* | Program Attribute | LO | 7 |
| (7079,xx4C) | Program Parameter | OB | 1 |
| (7079,xx4D) | Image Processing Control | SH | 3 |

| (7079,xx4E)* | Component Position | SL | 46 |
|---|---|---|---|
| (7079,xx4F) | ECG Status | SH | 3 |
| (7079,xx50) | ECG Data | US | 1-n |
| (7079,xx51) | Pressure Data | US | 1-n |
| (7079,xx52) | Heart Beat | US | 1 |
| (7079,xx53) | ABC ROI Type | SH | 1 |
| (7079,xx54) | ABC ROI Area | US | 5 |
| (7079,xx55) | SEC History | UL | 47-47n |
| (7079,xx56) | Mask Stage Number for SDSA | US | 1 |
| (7079,xx57) | Mask Frame for SDSA | US | 1-n |
| (7079,xx58) | Contrast Stage Number for SDSA | US | 1 |
| (7079,xx59) | Contrast Frame Range for SDSA | US | 2-2n |
| (7079,xx5A) | Contrast Stage Number for RDSA | US | 1 |
| (7079,xx5B) | Mask Frame Range for RDSA | US | 2 |
| (7079,xx5C) | Contrast Frame Range for RDSA | US | 2-2n |
| (7079,xx5D) | Sequence Mode for RDSA | SH | 1 |
| (7079,xx5E) | Stereo Display for RDSA | US | 2 |
| (7079,xx5F) | Window for SDSA | SS | 4-4n |
| (7079,xx60) | Original Mask Frame Table | US | 1-n |
| (7079,xx61) | Historical Data for SDSA | SS | 30-30n |
| (7079,xx62) | Historical Data for RDSA | US | 4 |
| (7079,xx63) | X-ray trigger (mask stage) for RDSA | US | 1-n |
| (7079,xx64) | Camera timing (mask stage) for RDSA | US | 1-n |
| (7079,xx65) | Pulse width (mask stage) for RDSA | US | 1-n |
| (7079,xx66) | X-ray trigger (1st contrast stage) for RDSA | US | 1-n |
| (7079,xx67) | Camera timing (1st contrast stage) for RDSA | US | 1-n |
| (7079,xx68) | Pulse width (1st contrast stage) for RDSA | US | 1-n |
| (7079,xx69) | X-ray trigger (2nd contrast stage) for RDSA | US | 1-n |
| (7079,xx6A) | Camera timing (2nd contrast stage) for RDSA | US | 1-n |
| (7079,xx6B) | Pulse width (2nd contrast stage) for RDSA | US | 1-n |
| (7079,xx6C) | Image Processing Control Step | US | 1 |
| (7079,xx6D) | Injector Offset Time | DS | 1 |
| (7079,xx6E) | Referenced LOID | DS | 1 |
| (7079,xx6F) | Primary Angle of another plane | DS | 1 |
| (7079,xx70) | Secondary Angle of another plane | DS | 1 |
| (7079,xx71) | Primary Angle Increment of another plane | DS | 1-n |
| (7079,xx72) | Secondary Angle Increment of another plane | DS | 1-n |
| (7079,xx73) | CT Position | SL | 4 |
| (7079,xx74)* | Component Position of another plane | SL | 32 |
| (7079,xx75) | Image Flip Flag | SH | 1 |
| (7079,xx76) | Image Rotation Mode | US | 1 |
| (7079,xx77) | Start Frame of Fluoro Cyclic Recording | SL | 1 |
| (7079,xx78) | Detector Size info | US | 1 |

| (7079,xx79) | Detector FOV info | US | 1 |
|---|---|---|---|
| (7079,xx7A)* | DSA Rotation Data for LCI Mode | US | 1 |
| (7079,xx7B)* | Image Quality | SH | 1 |
| (7079,xx7C)* | Image Shutter Flag | SH | 1 |
| (7079,xx7D)* | Image Shutter info | US | 8 |
| (7079,xx7E) | Overlay info | OB | 1 |
| (7079,xx80) | Detector Type info | LO | 1 |
| (7079,xx81) | Pixel Shift table X | SS | 1-n |
| (7079,xx82) | Pixel Shift table Y | SS | 1-n |

\*: Please see Table8.2-2

**Table 8.2-2**
**CHANGED DATA DICTIONARY OF PRIVATE ATTRIBUTES**

| Tag | Changed software version | Comment |
|---|---|---|
| (7079,xx34) | V4.00 | VM is changed from "1" to "2". |
| (7079,xx35) | V3.20 | VM is changed from "1" to "8". |
| (7079,xx36) | V3.20 | VM is changed from "1" to "8". |
| (7079,xx37) | V3.20 | VM is changed from "4" to "32". |
| (7079,xx3C) | V3.62 | VM is changed from "2" to "3". |
| (7079,xx46) | V3.62 | VM is changed from "1" to "2". |
| (7079,xx4B) | V3.63 | VM is changed from "3" to "7". |
| (7079,xx4E) | V4.22 | VM is changed from "35" to "46". |
| (7079,xx74) | V3.21 | VM is changed from "28" to "32". |
| (7079,xx7A) | V3.42 | This is new attribute added from V3.42. |
| (7079,xx7B) | V3.42 | This is new attribute added from V3.42. |
| (7079,xx7C) | V3.63 | This is new attribute added from V3.63. |
| (7079,xx7D) | V3.63 | This is new attribute added from V3.63. |

## 8.3   CONTROLLED TERMINOLOGY AND TEMPLATES

Not applicable to this product

## 8.4   GRAYSCALE IMAGE CONSISTENCY

Not applicable to this product

## 8.5   STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

Not applicable to this product

## 8.6   PRIVATE TRANSFER SYNTAXES

Not applicable to this product

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