**Cambridge Computed Imaging Ltd**

# CADRAN Image Storage Manager

# DICOM conformance Statement

Version 1.7.11

## Intended Audience

It is assumed that any readers of this document are familiar with the DICOM standard

## Credits and Trademarks



## Revision History

| Revision | Comments | Date |
|---|---|---|
| 1.0 | Initial version | January 2001 |
| 1.6 | Updates to core services. Added DICOM Print | April 2004 |
| 2.0 | Integrated with XenData Archive extender for Tape library support | Jan 2005 |
| 2.1 | Update Worklist SCP for integration with HL7 interface | August 2005 |
| 1.7.6.1 | Change of numbering scheme to match current CADRANISM server | November 2007 |
| 1.7.8.0 | Minor updates | November 2007 |
| 1.7.9 | Updated version | January 2008 |
| 1.7.10 | Updated version | April 2008 |
| 1.7.11 | Updated version | June 2008 |

# Table of Contents

# 1. Introduction

## *1.1 Purpose:*

Define the DICOM Conformance statement associated with the CADRAN Image Storage Manager (ISM)

## *1.2 Scope:*

This document describes the DICOM Conformance statement in accordance with the document DICOM PS 3.2 Conformance.

## *1.3 References:*

DICOM PS 3.2 Conformance
DICOM PS 3.3 Information Object Definitions
DICOM PS 3.4 Service Class Specifications
DICOM PS 3.5 Data Structures and Encoding
DICOM PS 3.6 Data Dictionary
DICOM PS 3.7 Message Exchange
DICOM PS 3.8 Network Communication Support for Message Exchange
DICOM PS 3.10 Media Storage and File Format for Data Interchange
DICOM PS 3.11 Media Storage Application Profiles
DICOM PS 3.12 Media Format and Physical Media for Media Interchange

## *1.4 Equipment/Materials:*

N/A

## *1.5 Responsibilities:*

N/A

## *1.6 Definitions:*

AE – Application Entity
FSC - File Set Creator
FSR - File Set Reader
FSU - File Set Updater
RWA – Real Worls Activity
SCU - Service Class User
SCP - Service Class Provider
SOP – Service Object Pair
UID – Unique Identifier
ISM – Image Storage Manager

## *1.7 Instructions:*

The rest of this document is written in the format specified for DICOM Conformance statements in the DICOM PS 3.2 Conformance standard document.

Text that is formatted as strikethough text – ~~like this~~ – has been removed from this version of CADRANISM. Text that is formatted as italics – *like this* – is not currently implemented, but may be implemented in future versions.

# 2. Implementation Model

The CADRAN ISM products act as electronic or media storage for digital format medical images. The CADRAN ISM product consists of a collection of components which together provide DICOM services. Through the use of the CADRAN ISM product and using the DICOM interface, a suitable remote AE can:

- Place images on the CADRAN ISM across a network.
- Inquire of the contents of the CADRAN ISM storage.
- Request that CADRAN ISM send images to another DICOM AE across a network.
- Inquire of the contents of a DICOM worklist.

Local functionality of the CADRAN ISM allows the CADRAN ISM products to:

- Inquire what images are held by a remote AE.
- Request a remote AE to place images on the CADRAN ISM.
- Send images to another DICOM AE across a network.
- Print an image on a remote DICOM networked printer
- Send a worklist Query to a remote Worklist AE.

In addition, local functionality of the CADRAN Viewer and CADRAN Exporter software components and suitable media allows the CADRAN ISM products to:

- Read or create CD-R media with the DICOM Basic Cardiac X-Ray Angiographic Application profile (STD-XABC-CD).
- Read or create CD (including CD-R) or DVD media (including DVD-R, DVD-RAM) media with the General Purpose Application profile

# 3. Application Data Flow Diagrams

**Figure 1 Store SCP Data flow**

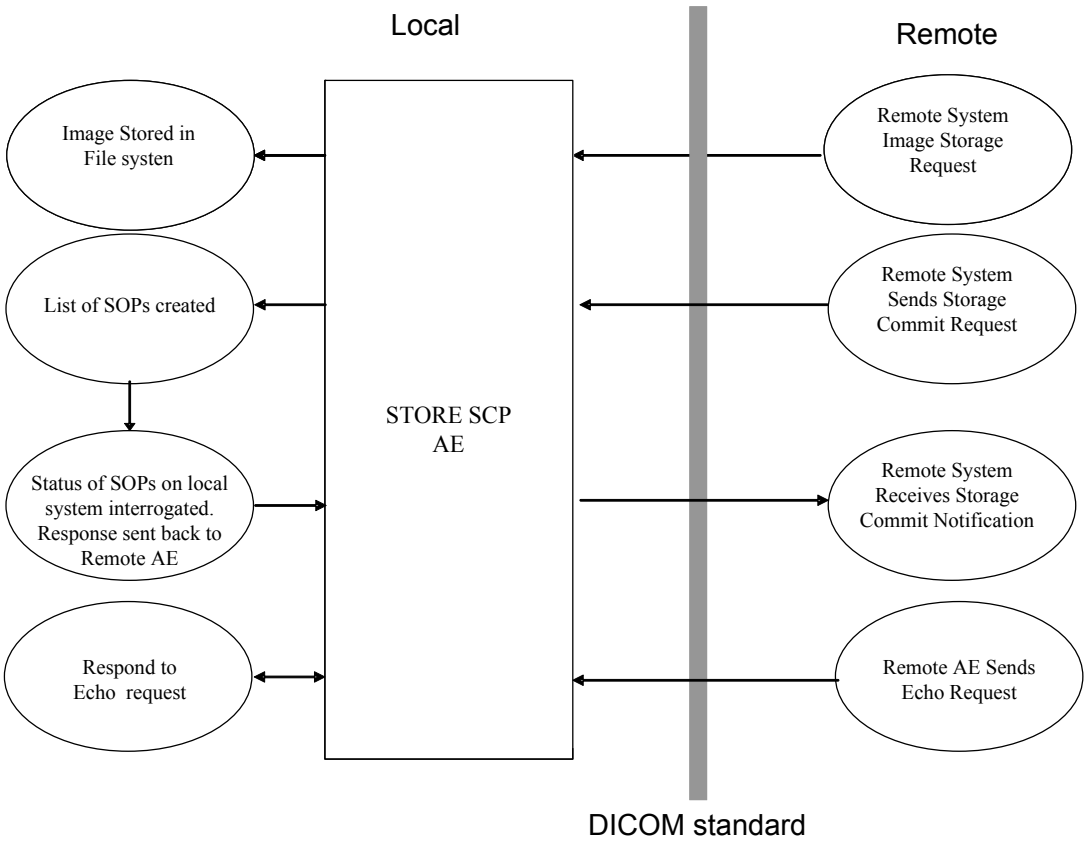



**Figure 2 Store SCU data flow**

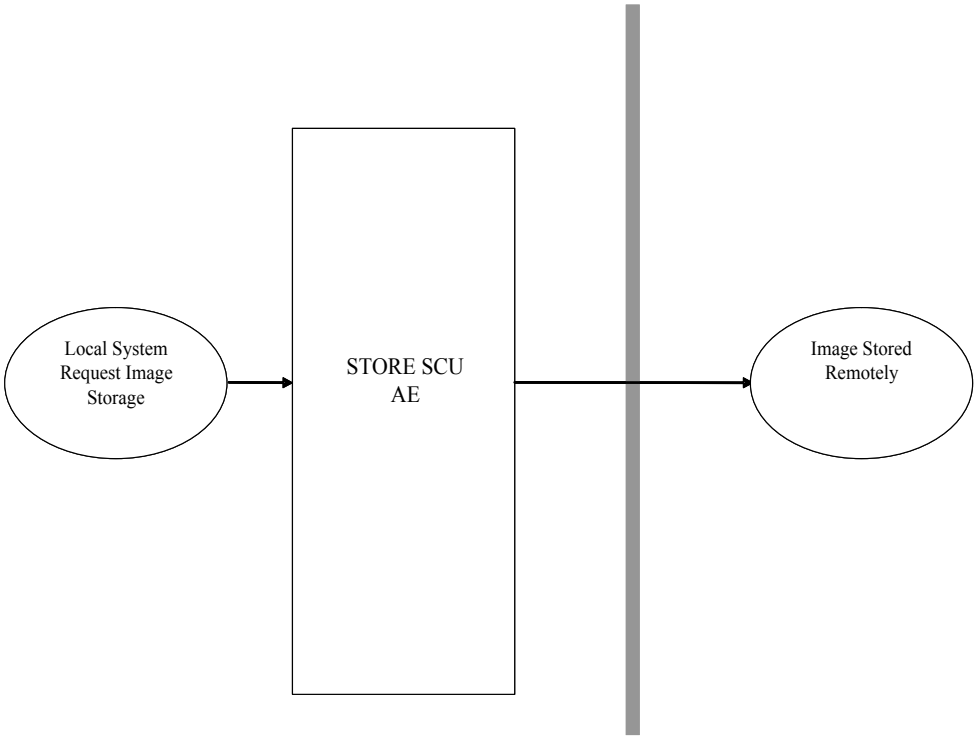


**Figure 3 QR SCP Data flow**

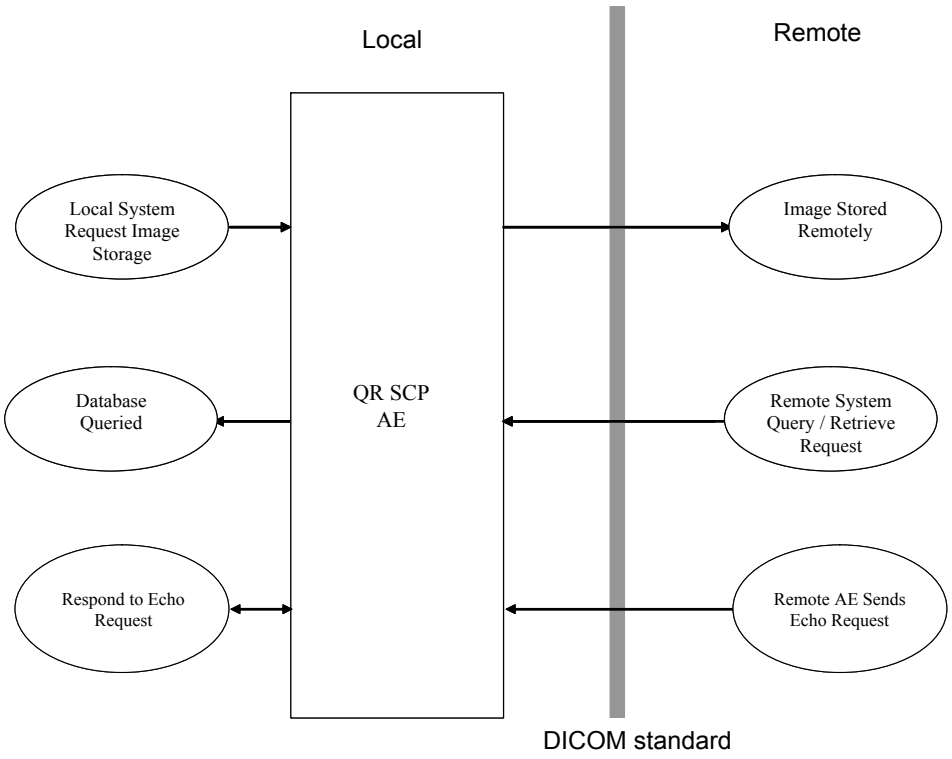



**Figure 4 QR SCU Client data flow**

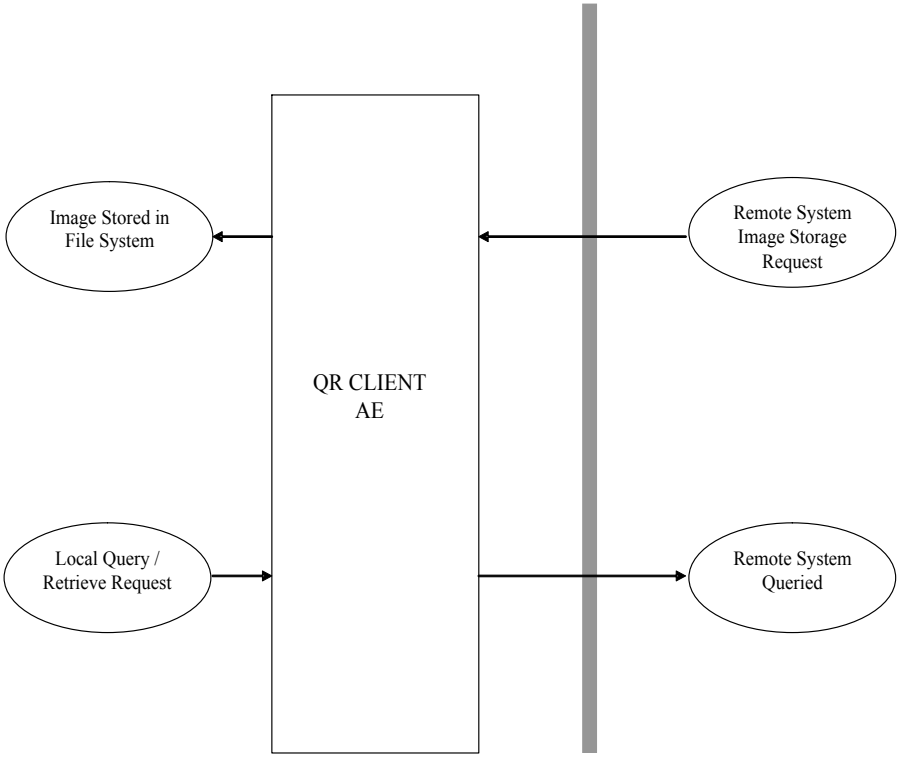


**Figure 5 Work SCU Data Flow**

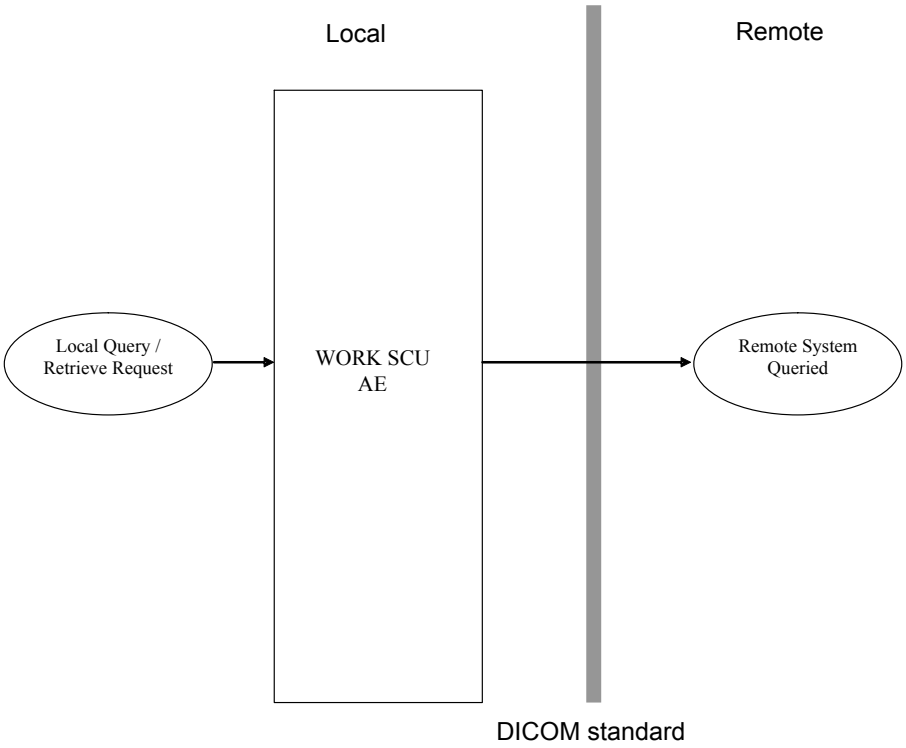



**Figure 6 Work SCP Data Flow**

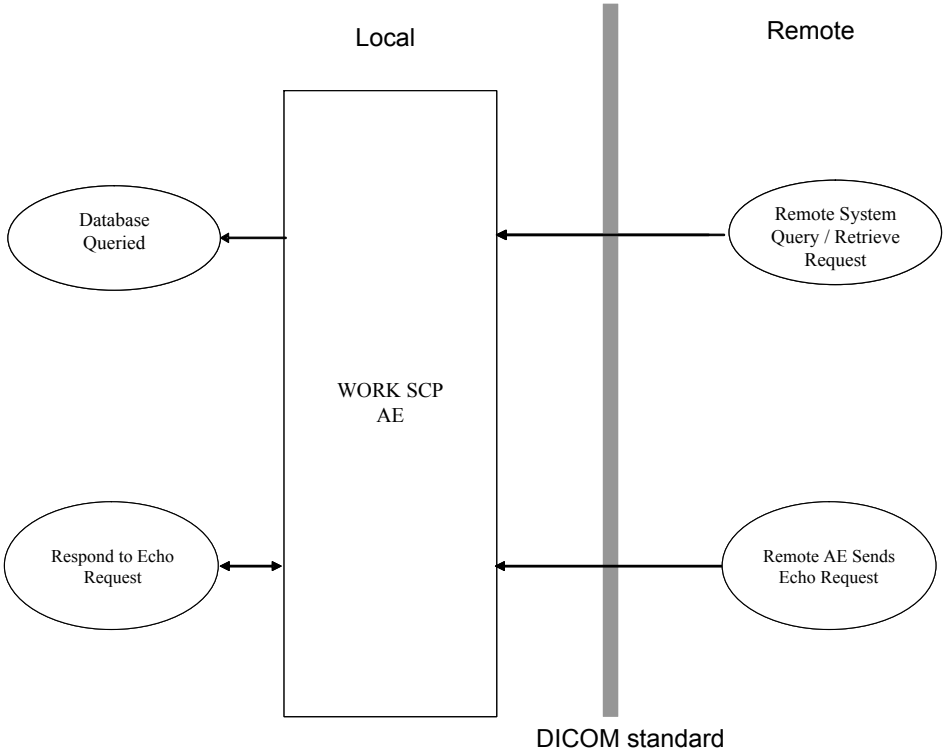


**Figure 7 Print SCU Data Flow**

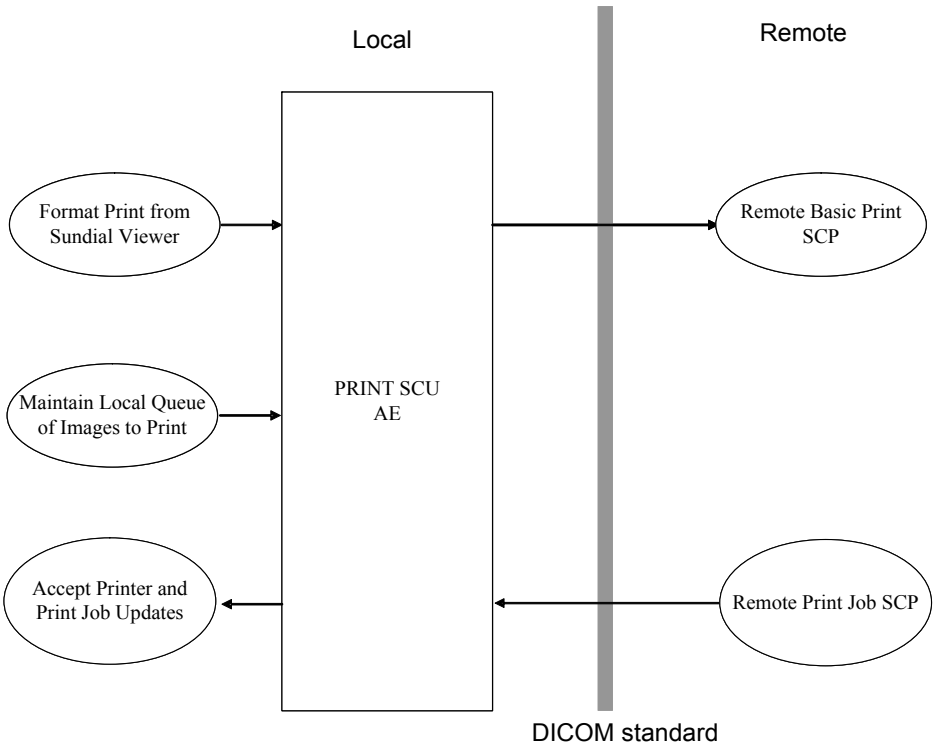
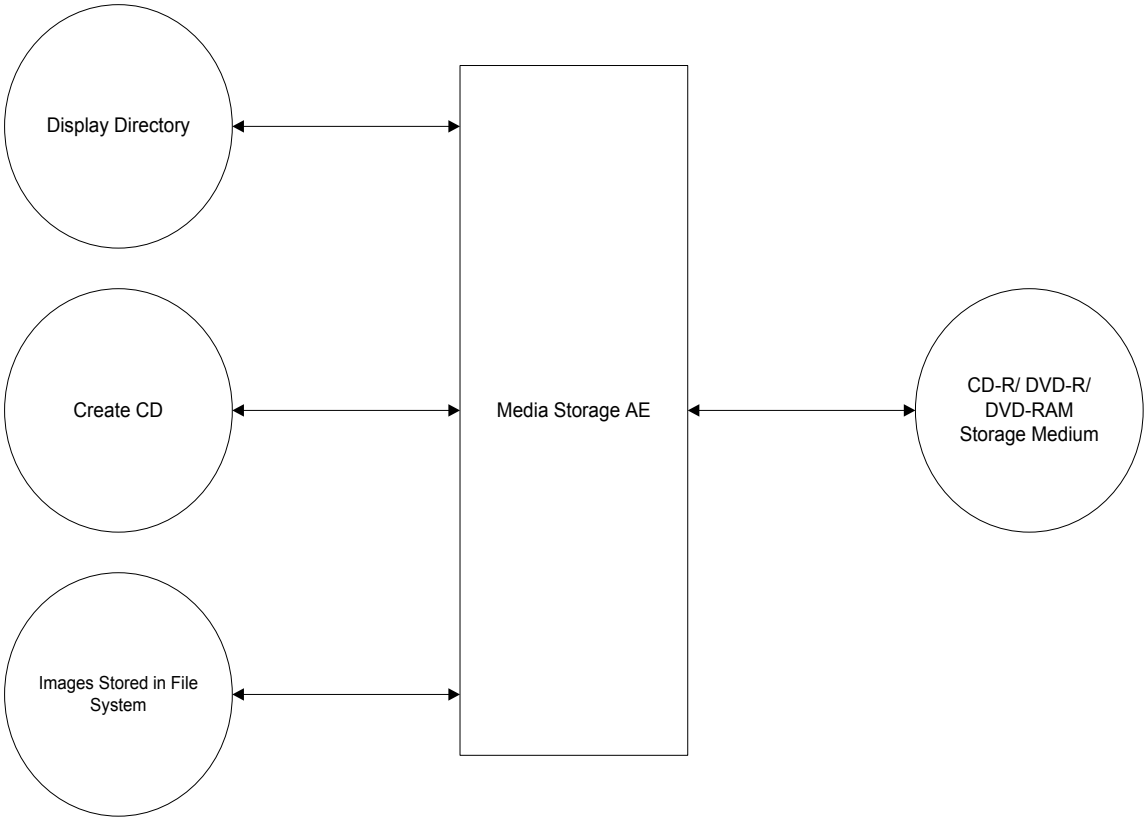



**Figure 8 Media Storage AE Data flow**



# 4. Functional definition of AEs

CADRAN ISM DICOM functionality described above is spread over 8 different applications: CADRAN_STORE_SCP (a C-STORE SCP), CADRAN_STORE_SCU (aC-STORE SCU), CADRAN_QR_SCP (a Query Retreive C-MOVE and C-FIND SCP, and a C-STORE SCU in response to C-MOVE requests from a remote Query retrieve SCU), QR_CLIENT (a Query Retrieve C-MOVE and C-FIND SCU), CADRAN_WORK_SCP (a Modality Worklist C-FIND SCP), CADRAN_WORK_SCU (a Modality Worklist C-FIND SCU), CADRAN_PRINT_SCU (a DICOM Print SCU), and MEDIA STORAGE. Note that the first 7 applications are provided by CADRAN ISM, which must be configured so that requests to the C-STORE SCP, Query Retreive C-MOVE/C-FIND SCP and Worklist C-FIND SCP take place on different TCP/IP ports. The MEDIA STORAGE AE, and the user interface elements of DICOM Print SCU are provided through the CADRAN Viewer and CADRAN Exporter software components, which have their own DICOM conformance statement.

## *4.1 CADRAN_STORE_SCP AE:*

CADRAN_STORE_SCP can operate as a command line application or as a Windows NT Service, and provides C-STORE SCP functionality to CADRAN ISM. Generally CADRAN_STORE_SCP is configured to begin automatically on system startup and run continuously until shutdown. Note that CADRAN_STORE_SCP and CADRAN_QR_SCP and must be configured to listen on different TCP/IP ports.

As a SCP for C-STORE, CADRAN ISM listens for storage proposals from remote AEs. Following acceptance by CADRAN ISM of an association request from a remote AE, the remote AE transmits the DICOM Information Objects to CADRAN ISM. CADRAN ISM stores the received Information Object and updates its database. A response is sent to the remote AE indicating the result status of the storage operation. CADRAN_STORE_SCP also functions as a SCP for C-ECHO, and as such listens for communication verification requests from remote AEs, and replies with the C-ECHO response.

*In version 2.1 and later, CADRAN_STORE_SCP supports the Storage Commitment service class as an SCP.*

## *4.2 CADRAN_STORE_SCU AE:*

CADRAN_STORE_SCU operates a command line application, or as Windows NT Service, and provides DICOM Store SCU functionality to CADRAN ISM. DICOM send requests are submitted by CADRANISM client applications. CADRAN_STORE_SCU interrogates this send request list and transmits the requested images to the remote Store SCP. CADRAN_SEND_SCU updates the records of Send Job Status accordingly.

### *4.3 CADRAN_QR_SCP AE:*

CADRAN_QR_SCP can operate as a command line application or as a Windows NT Service, and provides C-FIND SCP, C-MOVE SCP and, in response to C-MOVE requests, C-STORE SCU functionality to CADRAN ISM. Generally CADRAN_QR_SCP is configured to begin automatically on system startup and run continuously until shutdown. Note that CADRAN_QR_SCP and CADRAN_STORE_SCP and must be configured to listen on different TCP/IP ports.

As a SCP for C-FIND, CADRAN ISM listens for association requests from a remote AE. Following acceptance by CADRAN ISM of an association request from a remote AE, the remote AE transmits the DICOM Query requests to CADRAN ISM. CADRAN ISM queries its database and returns the matches to the remote AE as DICOM Query responses. As a SCP for C-MOVE, CADRAN ISM listens for association requests from a remote AE. Following acceptance by CADRAN ISM of an association request from a remote AE, the remote AE transmits the DICOM Retrieve requests to CADRAN ISM. CADRAN ISM queries its database and initiates storage requests to the remote AE. CADRAN ISM transmits the result status of the retrieve request as a final retrieve response. CADRAN_QR_SCP also functions as a SCP for C-ECHO, and as such listens for communication verification requests from remote AEs, and replies with the C-ECHO response.

CADRAN_QR_SCP is aware of the On-Line, Near-Line and Off-Line status of Images, Series and Studies. This information is returned via the DICOM interface. When an object is offline, the media labels for the tape media are returned to the caller.

### *4.4 QR CLIENT AE:*

QR_CLIENT is a windows application that provides C-FIND SCU and C-MOVE SCU functionality to CADRAN ISM. As an SCU for C-FIND, a user interface command causes CADRAN ISM to request an association with a remote system. Following acceptance of the association by the remote system, CADRAN ISM transmits the DICOM Query requests. The remote system returns the matches as DICOM Query responses to CADRAN ISM, which displays them in the user interface. As a SCU for C-MOVE, a user interface command causes CADRAN ISM to request an association with a remote system. Following acceptance of the association by the remote system, CADRAN ISM transmits the DICOM Retrieve requests to the remote system. If a C-MOVE is requested, CADRAN ISM will wait for a final response from the remote system returns which it displays the in the user interface.

### *4.5 CADRAN_PRINT_SCU AE:*

CADRAN_PRINT_SCU can operate as a command line application or as a Windows NT Service, and provides DICOM Print SCU functionality to CADRAN ISM. Images are preformatted by the CADRAN Viewer application, and a request to print them submitted. CADRAN_PRINT_SCU interrogates this print request list and sends the requested pages to the remote Basic Print SCP. CADRAN_PRINT_SCU waits for Print Job status reports from the remote Print SCP, and updates local the records of Print Job Status accordingly.

### *4.6 CADRAN_WORK_SCP AE:*

CADRAN_WORK_SCP can operate as a command line application or as a Windows NT Service, and provides Modality Worklist C-FIND SCP functionality to CADRAN ISM. Generally CADRAN_WORK_SCP is configured to begin automatically on system startup and run continuously until shutdown. Note that CADRAN_QR_SCP and CADRAN_STORE_SCP and must be configured to listen on different TCP/IP ports.

As a SCP for C-FIND, CADRAN ISM listens for association requests from a remote AE. Following acceptance by CADRAN ISM of an association request from a remote AE, the remote AE transmits the DICOM Query requests to CADRAN ISM. CADRAN ISM queries its database and returns the matches to the remote AE as DICOM Query responses. CADRAN_WORK_SCP also functions as a SCP for C-ECHO, and as such listens for communication verification requests from remote AEs, and replies with the C-ECHO response.

### *4.7 CADRAN_WORK_SCU AE:*

CADRAN_WORK_SCU is a windows application that provides Modality Worklist C-FIND SCU to CADRAN applications. As an SCU for C-FIND, a user interface command causes a request for an association with a remote system. Following acceptance of the association by the remote system, CADRAN ISM transmits the DICOM Query requests. The remote system returns the matches as DICOM Query responses to CADRAN ISM, which displays them in the user interface.

### *4.8 MEDIA STORAGE AE:*

The Media Storage AE can perform the following functions:

- It can initialize a piece of media, writing a new DICOM File-set onto the media.
- It can display a directory listing of the File-set on a piece of media.
- It can copy SOP instances from the media onto local storage.

## 5. Sequencing of Real World Activities

NA

## 6. File Meta Information Options

Implementation Class UID = “1.2.826.0.1.3680043.2.91.1.0.2.1”

Implementation Version Name = “CCI178_M370IB5”

The Implementation Class UID is part of the File Meta Information written into every file and therefore necessary for any device that acts as an FSC.

# 7. AE Specifications

## *7.1 CADRAN_STORE_SCP AE – Specification*

The CADRAN_STORE_SCP AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 1 as an SCP. Note that the CADRAN_STORE_SCP AE is highly configurable, and as such not all classes in the list may be accepted when using the default configuration, i.e. configuration changes may be required (see section 10).

**Table 1**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.1.1 | Verification SOP Class |
| 1.2.840.10008.5.1.4.1.1.1 | Computed Radiography Image Storage |
| 1.2.840.10008.5.1.4.1.1.2 | CT Image Storage |
| 1.2.840.10008.5.1.4.1.1.3.1 | Ultrasound Multi-frame Image Storage |
| 1.2.840.10008.5.1.4.1.1.4 | MR Image Storage |
| 1.2.840.10008.5.1.4.1.1.20 | Nuclear Medicine Image Storage |
| 1.2.840.10008.5.1.4.1.1.6.1 | Ultrasound Image Storage |
| 1.2.840.10008.5.1.4.1.1.7 | Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.7.2 | Multi-Frame Greyscale Byte Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.7.3 | Multi-Frame Greyscale Word Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.7.4 | Multi-Frame True Colour Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.8 | Standalone Overlay Storage |
| 1.2.840.10008.5.1.4.1.1.9 | Standalone Curve Storage |
| 1.2.840.10008.5.1.4.1.1.10 | Standalone Modality LUT Storage |
| 1.2.840.10008.5.1.4.1.1.11 | Standalone VOI LUT Storage |
| 1.2.840.10008.5.1.4.1.1.12.1 | Standard Xray Angio |
| 1.2.840.10008.5.1.4.1.1.12.2 | Standard Xray RF |
| 1.2.840.10008.5.1.4.1.1.12.3 | Standard Xray Angio Biplane |
| 1.2.840.10008.5.1.4.1.1.128 | Standard Positron Emission Tomography Image Storage |
| 1.2.840.10008.5.1.4.1.1.129 | Standard Positron Emission Tomography Curve Storage |
| 1.2.840.10008.5.1.4.1.1.481.4 | Standard RT Beams Treatment Record Storage |
| 1.2.840.10008.5.1.4.1.1.481.6 | Standard RT Brachy Treatment Record Storage |
| 1.2.840.10008.5.1.4.1.1.481.1 | Standard RT Image Storage |
| 1.2.840.10008.5.1.4.1.1.481.2 | Standard RT Dose Storage |
| 1.2.840.10008.5.1.4.1.1.481.3 | Standard RT Structure Set Storage |
| 1.2.840.10008.5.1.4.1.1.481.5 | Standard RT Plan Storage |
| 1.2.840.10008.5.1.4.1.1.481.7 | Standard RT Treatment Summary Record Storage |
| 1.2.840.10008.5.1.1.30 | Hardcopy Color Image Storage |
| 1.2.840.10008.5.1.1.29 | Hardcopy Grayscale Image Storage |
| 1.2.840.10008.5.1.1.27 | Stored Print Storage |

| | |
|---|---|
| 1.2.840.10008.5.1.4.1.1.1.1 | Digital X-Ray Image Storage - For Presentation |
| 1.2.840.10008.5.1.4.1.1.1.1.1 | Digital X-Ray Image Storage - For Processing |
| 1.2.840.10008.5.1.4.1.1.1.3 | Digital Intra-oral X-Ray Image Storage – For Presentation |
| 1.2.840.10008.5.1.4.1.1.1.3.1 | Digital Intra-oral X-Ray Image Storage – For Processing |
| 1.2.840.10008.5.1.4.1.1.1.2 | Digital Mammography Image Storage – For Presentation |
| 1.2.840.10008.5.1.4.1.1.1.2.1 | Digital Mammography Image Storage – For Processing |
| 1.2.840.10008.5.1.4.1.1.77.1.1 | VL Endoscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.2 | VL Microscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.4 | VL Photographic Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.3 | VL Slide-Coordinates Microscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.88.11 | Basic Text Structured Reporting SOP |
| 1.2.840.10008.5.1.4.1.1.88.33 | Comprehensive Structured Reporting SOP |
| 1.2.840.10008.5.1.4.1.1.88.22 | Enhanced Structured Reporting SOP |
| 1.2.840.10008.5.1.4.1.1.88.50 | Mammography CAD Structure Reporting SOP |

### 7.1.1 Association establishment policies

#### 7.1.1.1 General

The AE Title of the CADRAN_STORE_SCP AE is a configurable parameter. The default title is “CADRAN_ST_SCP”.

The CADRAN_STORE_SCP AE waits for an association as an SCP of the Storage Services.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.1.1.2 Number of Associations

The CADRAN_STORE_SCP AE will handled up to 5 storage SCP associations simultaneously.

#### 7.1.1.3 Asynchronous nature

The CADRAN_STORE_SCP AE does not support asynchronous operations.

#### 7.1.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the CADRAN_STORE_SCP AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the CADRAN_STORE_SCP AE is:

**CCI178_M370IB5**

#### 7.1.1.5 Association initiation policy

The AE Title of the CADRAN_STORE_SCP AE is a configurable parameter. The default title is “CADRAN_ST_SCP”.

CADRAN_STORE_SCP AE will attempt to establish an association to a remote Storage Commit SCU to facilitate a N-EVENT-REPORT reply to a N-ACTION Storage Commit request.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.1.1.6 Association acceptance policy

The CADRAN_STORE_SCP AE accepts associations for the store and verification services.

### 7.1.2 Real World Activity – Receive Echo

#### 7.1.2.1 Associated Real-World Activity – Reply to Echo Request

The associated activity is a C-ECHO request.

#### 7.1.2.2 Proposed Presentation Contexts

The CADRAN_STORE_SCP AE will propose Presentation Contexts as shown in Table 2.

**Table 2**

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

#### 7.1.2.3 SOP Specific Conformance

The CADRAN_STORE_SCP AE provides standard conformance to the DICOM Verification Service Class as a SCP.

### 7.1.3 Real World Activity – Receive Images from a Remote AE

#### 7.1.3.1 Associated Real-World Activity

The associated activity is an incoming C-STORE request. Following acceptance of the association the CADRAN_STORE_SCP AE receives the images on the open

association. The internal database is updated on transfer of each image. An appropriate response is returned.

#### 7.1.3.2 Accepted Presentation Contexts

CADRAN_STORE_SCP AE will accept presentation contexts as shown in Table 3. Note that configuration changes (as outlined in section 10) may be required for CADRAN_STORE_SCP to accept a paticular Abstract Syntax/Transfer Syntax pair. Note that when CADRAN_STORE_SCP receives an uncompressed image of implicit little endian or explicit big endian, it is synchronously transformed to explicit little endian before storage. Uncompressed X-ray angio images (Abstract syntax UID 1.2.840.10008.5.1.4.1.1.12.1) are asynchronously transformed to transfer syntax JPEG lossless Hier14 (UID 1.2.840.10008.1.2.4.70) before storage. Images of all other transfer syntaxes are stored in the transfer syntax in which they are received.

**Table 3**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| CR | 1.2.840.10008.5.1.4.1.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| CT | 1.2.840.10008.5.1.4.1.1.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| US Multi-frame | 1.2.840.10008.5.1.4.1.1.3.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| MR | 1.2.840.10008.5.1.4.1.1.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| NM | 1.2.840.10008.5.1.4.1.1.20 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| US | 1.2.840.10008.5.1.4.1.1.6.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| SC | 1.2.840.10008.5.1.4.1.1.7 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Multi-Frame Greyscale Byte Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Multi-Frame Greyscale Word Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Multi-Frame True Colour Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Standalone Overlay | 1.2.840.10008.5.1.4.1.1.8 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| Standalone Curve | 1.2.840.10008.5.1.4.1.1.9 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Standalone Modality LUT | 1.2.840.10008.5.1.4.1.1.10 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Standalone VOI LUT | 1.2.840.10008.5.1.4.1.1.11 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Xray Angio | 1.2.840.10008.5.1.4.1.1.12.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Xray RF | 1.2.840.10008.5.1.4.1.1.12.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Xray Angio Biplane | 1.2.840.10008.5.1.4.1.1.12.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| PET | 1.2.840.10008.5.1.4.1.1.128 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCP | None |
| PET Curve | 1.2.840.10008.5.1.4.1.1.129 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| RT Beams | 1.2.840.10008.5.1.4.1.1.481.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| RT Brachy | 1.2.840.10008.5.1.4.1.1.481.6 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| RT | 1.2.840.10008.5.1.4.1.1.481.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| RT Dose | 1.2.840.10008.5.1.4.1.1.481.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| RT Structure Set | 1.2.840.10008.5.1.4.1.1.481.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| RT Plan | 1.2.840.10008.5.1.4.1.1.481.5 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| RT Treatment Summary Record | 1.2.840.10008.5.1.4.1.1.481.7 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Hardcopy Color | 1.2.840.10008.5.1.1.30 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Hardcopy Grayscale | 1.2.840.10008.5.1.1.29 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Stored Print | 1.2.840.10008.5.1.1.27 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| DR- Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCP | None |
| DR - Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Digital Intra-oral X-Ray – For Presentation | 1.2.840.10008.5.1.4.1.1.1.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Digital Intra-oral X-Ray – For Processing | 1.2.840.10008.5.1.4.1.1.1.3.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| Digital Mammography – For Presentation | 1.2.840.10008.5.1.4.1.1.1.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCP | None |
| Digital Mammography Processing | 1.2.840.10008.5.1.4.1.1.1.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCP | None |
| VL Endoscopic | 1.2.840.10008.5.1.4.1.1.77.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| VL Microscopic | 1.2.840.10008.5.1.4.1.1.77.1.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| VL Photographic | 1.2.840.10008.5.1.4.1.1.77.1.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| VL Slide-Coordinates Microscopic | 1.2.840.10008.5.1.4.1.1.77.1.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Basic Text Structured Reporting SO | 1.2.840.10008.5.1.4.1.1.88.11 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Comprehensive Structured Reporting SOP | 1.2.840.10008.5.1.4.1.1.88.33 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Enhanced Structured Reporting SOP | 1.2.840.10008.5.1.4.1.1.88.22 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

| | | | | | |
|---|---|---|---|---|---|
| Mammography CAD Structure Reporting SOP | 1.2.840.10008.5 .1.4.1.1.88.50 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

Table 4 shows those transfer syntaxes for which there is limited supported by CADRAN_STORE_SCP. CADRAN ISM is able to receive images in these transfer syntax, but will not be able to translate them to another encapsulated syntax. Any images received in these transfer syntaxes will be stored in the transfer syntax in which they are received, and can only be transmitted by the STORE SCU in this syntax.

**Table 4**

| Limited SupportTransfer syntax list | |
|---|---|
| Name | UID |
| JPEG Extended 2 4 | 1.2.840.10008.1.2.4.51 |
| JPEG Extended 3 5 | 1.2.840.10008.1.2.4.52 |
| JPEG Spec Non-Hier 6 8 | 1.2.840.10008.1.2.4.53 |
| JPEG Spec Non-Hier 7 9 | 1.2.840.10008.1.2.4.54 |
| JPEG Full Prog Non-Hier 10 12 | 1.2.840.10008.1.2.4.55 |
| JPEG Full Prog Non-Hier 11 13 | 1.2.840.10008.1.2.4.56 |
| JPEG Lossless Non-Hier 14 | 1.2.840.10008.1.2.4.57 |
| JPEG Lossless Non-Hier 15 | 1.2.840.10008.1.2.4.58 |
| JPEG Extended Hier 16 18 | 1.2.840.10008.1.2.4.59 |
| JPEG Extended Hier 17 19 | 1.2.840.10008.1.2.4.60 |
| JPEG Spec Hier 20 22 | 1.2.840.10008.1.2.4.61 |
| JPEG Spec Hier 21 23 | 1.2.840.10008.1.2.4.62 |
| JPEG Full Prog Hier 24 26 | 1.2.840.10008.1.2.4.63 |
| JPEG Full Prog Hier 25 27 | 1.2.840.10008.1.2.4.64 |
| JPEG Lossless Hier 28 | 1.2.840.10008.1.2.4.65 |
| JPEG Lossless Hier 29 | 1.2.840.10008.1.2.4.66 |

### 7.1.3.3 SOP Specific Conformance

The CADRAN_STORE_SCP AE conforms to the Storage SOP Class as an SCP at Level 2 (Full) as defined in PS3.4 (B.4.1). After storage, CADRAN_STORE_SCP AE responds as shown in Table 5.

**Table 5**

| Service Status | Further Meaning | Comments | Status Codes | Related Fields |
|---|---|---|---|---|
| Refused | Out of resources | A FIFO policy can be configured to | A7xx | (0000,0092) |

| | | | | |
|---|---|---|---|---|
| | | delete old data. | | |
| Error | Identifier does not match SOP Class | Incorrectly formed request | A9xx | (0000,0901)<br>(0000,0902) |
| Error | Cannot understand | Incomprehensible data | Cxxx | (0000,0901)<br>(0000,0902) |
| Success | | | 0000 | None |

*7.1.4 Real World Activity – Respond to Storage Commitment requests from a Remote AE.*

*Please note that this functionality is only present in versions 2.1 and later of CADRAN ISM.*

### *7.1.4.1 Associated Real-World Activity*

*The associated activity is an incoming N-ACTION storage commitment push request. Following acceptance of the association the CADRAN_STORE_SCP AE adds to an iternal list the SOP Instance UID's to be checked. Some time later, the system checks the status of the SOP UIDs, and sends an appropriate N-EVENT-REPORT as a reponse to the remote AE.*

### *7.1.4.2 Accepted Presentation Contexts*

*CADRAN_STORE_SCP AE will accept presentation contexts as shown in Table 6.*

***Table 6***

| *Presentation Context Table* | | | | | |
|---|---|---|---|---|---|
| *Abstract Syntax* | | *Transfer Syntax* | | *Role* | *Extended Negotiation* |
| *Name* | *UID* | *Name List* | *UID List* | | |
| *STORAGE_COMMITMENT_PUSH* | *1.2.840.10008.1.20.1* | *Explicit VR Little Endian*<br>*Implicit VR Little Endian*<br>*Explicit VR Big Endian* | *1.2.840.10008.1.2.1*<br>*1.2.840.10008.1.2*<br>*1.2.840.10008.1.2.2* | *SCP* | *None* |

### *7.1.4.3 SOP Specific Conformance*

*The CADRAN_STORE_SCP AE conforms to the Storage Commitment Push SOP Class as an SCP at Level 2 (Full) as defined in PS3.4 (B.4.1). Table 7 shows how CADRAN_STORE_SCP processes an incoming storage commit N-ACTION request.*

***Table 7***

| *Event Type Name* | *Command* | *Attribute name* | *Tag* | *Comment* |
|---|---|---|---|---|
| *Request Storage commit* | *N_ACTION – Action Type ID = 1* | *Transaction UID* | *(0008,1195)* | *Stored locally, and returned to calling AE when appropriate* |
| | | *Referenced SOP Sequence* | *(0088,1199)* | *Supported* |
| | | *>Referenced SOP Class UID* | *(0008,1150)* | *Supported* |
| | | *>Referenced SOP Class UID* | *(0008,1155)* | *Supported* |

*Please note that any Storage Media File-Set IDs (0088,0130) or File-Set UIDs (0088,0140) are ignored – the SCP makes no commitment to store data on a particular piece of media.*

*By default, CADRAN ISM is configured to only return the status of SOP instance to the Remote AE once the relevant SOPs have been commited to more than item of media, such as both disk and tape. In this way the remote AE can confident that the SOPs are safely stored after the receipt of a successful response from the CADRAN ISM.*

*The CADRAN_STORE_SCP AE creates a N-EVENT-REPORT to send to the the AE as shown in Table 8 below.*

***Table 8***

| *Action Type Name* | *Command* | *Attribute name* | *Tag* | *Comment* |
|---|---|---|---|---|
| *Storage commit request successful* | *N_EVENT-REPORT – Event Type ID = 1* | *Transaction UID* | *(0008,1195)* | |
| | | *Retrieve AE Title* | *(0008,0054)* | |
| | | *Referenced SOP Sequence* | *(0088,1199)* | |
| | | *>Referenced SOP Class UID* | *(0008,1150)* | |
| | | *>Referenced SOP Class UID* | *(0008,1155)* | |
| *Storage commit* | *N_EVENT-REPORT –* | *Transaction UID* | *(0008,1195)* | *As initially provided by* |

| | | | | |
|---|---|---|---|---|
| *request failed* | *Event Type ID = 0* | | | *caller.* |
| | | *Retrieve AE Title* | *(0008,0054)* | *The AE of CADRAN_QR SCP is provided* |
| | | *Referenced SOP Sequence* | *(0088,1199)* | |
| | | *>Referenced SOP Class UID* | *(0008,1150)* | |
| | | *>Referenced SOP Class UID* | *(0008,1155)* | |
| | | *Failed SOP Sequence* | *(0088,1198)* | |
| | | *>Referenced SOP Class UID* | *(0008,1150)* | |
| | | *>Referenced SOP Class UID* | *(0008,1155)* | |
| | | *>Failure Reason* | *(0008,1197)* | |

*Table 9 below shows values for the Failure reason Tag, and their meaning*

***Table 9***

| *Value* | *Meaning* | *Comments* |
|---|---|---|
| *0110H* | *Processing failure* | *A general failure in processing the operation was encountered.* |
| *0112H* | *No such object instance* | *One or more of the elements in the Referenced SOP Instance Sequence was not available.* |
| *0213H* | *Resource limitation* | *The SCP does not currently have enough resources to store the requested SOP Instance(s)* |
| *0122H* | *Referenced SOP class not supported* | *Storage Commitment has been requested for a SOP Instance with a SOP Class that is not supported by the SCP.* |
| *0119H* | *Class/Instance conflict* | *The SOP Class of an element in the Referenced SOP Instance Sequence did not correspond to the SOP class registered for this SOP Instance at the SCP.* |
| *0131H* | *Duplicate transaction UID* | *The Transaction UID of the Storage Commitment Request is already in use.* |

### *7.2 CADRAN_STORE_SCU AE – Specification*

The CADRAN_STORE_SCU AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 10 as a SCU. Note that the CADRAN_STORE_SCU AE is highly configurable, and as such, not all classes in the list may be accepted when using the default configuration, i.e. configuration changes may be required (see section 10).

**Table 10**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.5.1.4.1.1.1 | Computed Radiography Image Storage |
| 1.2.840.10008.5.1.4.1.1.2 | CT Image Storage |
| 1.2.840.10008.5.1.4.1.1.3.1 | Ultrasound Multi-frame Image Storage |
| 1.2.840.10008.5.1.4.1.1.4 | MR Image Storage |
| 1.2.840.10008.5.1.4.1.1.20 | Nuclear Medicine Image Storage |
| 1.2.840.10008.5.1.4.1.1.6.1 | Ultrasound Image Storage |
| 1.2.840.10008.5.1.4.1.1.7 | Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.7.2 | Multi-Frame Greyscale Byte Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.7.3 | Multi-Frame Greyscale Word Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.7.4 | Multi-Frame True Colour Secondary Capture Image Storage |
| 1.2.840.10008.5.1.4.1.1.8 | Standalone Overlay Storage |
| 1.2.840.10008.5.1.4.1.1.9 | Standalone Curve Storage |
| 1.2.840.10008.5.1.4.1.1.10 | Standalone Modality LUT Storage |
| 1.2.840.10008.5.1.4.1.1.11 | Standalone VOI LUT Storage |
| 1.2.840.10008.5.1.4.1.1.12.1 | Standard Xray Angio |
| 1.2.840.10008.5.1.4.1.1.12.2 | Standard Xray RF |
| 1.2.840.10008.5.1.4.1.1.12.3 | Standard Xray Angio Biplane |
| 1.2.840.10008.5.1.4.1.1.128 | Standard Positron Emission Tomography Image Storage |
| 1.2.840.10008.5.1.4.1.1.129 | Standard Positron Emission Tomography Curve Storage |
| 1.2.840.10008.5.1.4.1.1.481.4 | Standard RT Beams Treatment Record Storage |
| 1.2.840.10008.5.1.4.1.1.481.6 | Standard RT Brachy Treatment Record Storage |
| 1.2.840.10008.5.1.4.1.1.481.1 | Standard RT Image Storage |
| 1.2.840.10008.5.1.4.1.1.481.2 | Standard RT Dose Storage |
| 1.2.840.10008.5.1.4.1.1.481.3 | Standard RT Structure Set Storage |
| 1.2.840.10008.5.1.4.1.1.481.5 | Standard RT Plan Storage |
| 1.2.840.10008.5.1.4.1.1.481.7 | Standard RT Treatment Summary Record Storage |
| 1.2.840.10008.5.1.1.30 | Hardcopy Color Image Storage |
| 1.2.840.10008.5.1.1.29 | Hardcopy Grayscale Image Storage |
| 1.2.840.10008.5.1.1.27 | Stored Print Storage |
| 1.2.840.10008.5.1.4.1.1.1.1 | Digital X-Ray Image Storage - For Presentation |
| 1.2.840.10008.5.1.4.1.1.1.1.1 | Digital X-Ray Image Storage - For Processing |
| 1.2.840.10008.5.1.4.1.1.1.3 | Digital Intra-oral X-Ray Image Storage – For Presentation |

| | |
|---|---|
| 1.2.840.10008.5.1.4.1.1.1.3.1 | Digital Intra-oral X-Ray Image Storage – For Processing |
| 1.2.840.10008.5.1.4.1.1.1.2 | Digital Mammography Image Storage – For Presentation |
| 1.2.840.10008.5.1.4.1.1.1.2.1 | Digital Mammography Image Storage – For Processing |
| 1.2.840.10008.5.1.4.1.1.77.1.1 | VL Endoscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.2 | VL Microscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.4 | VL Photographic Image Storage |
| 1.2.840.10008.5.1.4.1.1.77.1.3 | VL Slide-Coordinates Microscopic Image Storage |
| 1.2.840.10008.5.1.4.1.1.88.11 | Basic Text Structured Reporting SOP |
| 1.2.840.10008.5.1.4.1.1.88.33 | Comprehensive Structured Reporting SOP |
| 1.2.840.10008.5.1.4.1.1.88.22 | Enhanced Structured Reporting SOP |
| 1.2.840.10008.5.1.4.1.1.88.50 | Mammography CAD Structure Reporting SOP |

### 7.2.1 Association establishment policies

#### 7.2.1.1 General

The AE Title of the CADRAN_STORE_SCU AE is a configurable parameter, and may be obtained from the database. The default title is “CADRAN_ST_SCU”.

CADRAN_STORE_SCU AE will attempt to establish an association when it is invoked from the user interface or through a system message to facilitate a C-MOVE request.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.2.1.2 Number of Associations

The CADRAN_STORE_SCU AE will only initiate on assocaition at a time.

#### 7.2.1.3 Asynchronous nature

The CADRAN_STORE_SCU AE does not support asynchronous operations.

#### 7.2.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the CADRAN_STORE_SCU AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the CADRAN_STORE_SCU AE is:

**CCI178_M370IB5**

#### 7.2.1.5 Association initiation policy

The CADRAN_STORE_SCU AE attempts to initiate an association for the following real world activity:

- Send images from CADRAN_STORE_SCU AE to a Remote AE.

#### 7.2.1.6 Association acceptance policy

The CADRAN_STORE_SCU AE does not accept associations.

### 7.2.2 Real World Activity – Send Images to Remote AE

#### 7.2.2.1 Associated Real-World Activity

The associated real-world activity is a C-STORE Request initiated by the user when images are selected for transfer to a remote AE.

#### 7.2.2.2 Manual Operation

The user selects the remote system and image sets to transfer in the user interface. Committing the transfer causes CADRAN_STORE_SCU AE to initiate an association with the remote AE for a C-STORE request.

#### 7.2.2.3 System Operation

In certain situations, CADRAN_STORE_SCU AE will initiate an asociation within a user request for a remote system for a C-STORE request.

#### 7.2.2.4 Proposed Presentation Contexts

CADRAN_STORE_SCU AE will accept presentation contexts as shown in Table 11. Note that CADRAN ISM is not capable of translating to or from a particular encapsulated transfer syntax. If an image is received by the CADRAN_STORE_SCP in a given encapsulated transfer syntax, it can only be sent by the CADRAN_STORE_SCU in that same transfer syntax. *The one exception to this rule, is that uncompressed Xray Angio images (SOP Class UID 1.2.840.10008.5.1.4.1.1.12.1) are translated into the compressed JPEG Lossless Hier 14 syntax (UID 1.2.840.10008.1.2.4.70) before storage or transmission.* CADRAN_STORE_SCU can freely translate between explicit little endian, implicit little endian and explicit big endian transfer syntaxes.

**Table 11**

| Store SCU Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |

| | | | | | |
|---|---|---|---|---|---|
| CR | 1.2.840.10008.5.1.4.1.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| CT | 1.2.840.10008.5.1.4.1.1.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| US Multi-frame | 1.2.840.10008.5.1.4.1.1.3.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| MR | 1.2.840.10008.5.1.4.1.1.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |

| | | | | | |
|---|---|---|---|---|---|
| NM | 1.2.840.10008.5.1.4.1.1.20 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| US | 1.2.840.10008.5.1.4.1.1.6.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| SC | 1.2.840.10008.5.1.4.1.1.7 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Multi-Frame Greyscale Byte Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |

| | | | | | |
|---|---|---|---|---|---|
| Multi-Frame Greyscale Word Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Multi-Frame True Colour Secondary Capture Image Storage | 1.2.840.10008.5.1.4.1.1.7.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Standalone Overlay | 1.2.840.10008.5.1.4.1.1.8 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Standalone Curve | 1.2.840.10008.5.1.4.1.1.9 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Standalone Modality LUT | 1.2.840.10008.5.1.4.1.1.10 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Standalone VOI LUT | 1.2.840.10008.5.1.4.1.1.11 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

| | | | | | |
|---|---|---|---|---|---|
| Xray Angio | 1.2.840.10008.5.1.4.1.1.12.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Xray RF | 1.2.840.10008.5.1.4.1.1.12.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Xray Angio Biplane | 1.2.840.10008.5.1.4.1.1.12.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| PET | 1.2.840.10008.5.1.4.1.1.128 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>RLE<br>JPEG Baseline<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.5<br>1.2.840.10008.1.2.4.50<br>1.2.840.10008.1.2.4.70 | SCU | None |
| PET Curve | 1.2.840.10008.5.1.4.1.1.129 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

| | | | | | |
|---|---|---|---|---|---|
| RT Beams | 1.2.840.10008.5.1.4.1.1.481.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| RT Brachy | 1.2.840.10008.5.1.4.1.1.481.6 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| RT | 1.2.840.10008.5.1.4.1.1.481.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| RT Dose | 1.2.840.10008.5.1.4.1.1.481.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| RT Structure Set | 1.2.840.10008.5.1.4.1.1.481.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| RT Plan | 1.2.840.10008.5.1.4.1.1.481.5 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| RT Treatment Summary Record | 1.2.840.10008.5.1.4.1.1.481.7 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Hardcopy Color | 1.2.840.10008.5.1.1.30 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Hardcopy Grayscale | 1.2.840.10008.5.1.1.29 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

| | | | | | |
|---|---|---|---|---|---|
| Stored Print | 1.2.840.10008.5.1.1.27 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| DR- Presentation | 1.2.840.10008.5.1.4.1.1.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCU | None |
| DR - Processing | 1.2.840.10008.5.1.4.1.1.1.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Digital Intra-oral X-Ray – For Presentation | 1.2.840.10008.5.1.4.1.1.1.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Digital Intra-oral X-Ray – For Processing | 1.2.840.10008.5.1.4.1.1.1.3.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Digital Mammography – For Presentation | 1.2.840.10008.5.1.4.1.1.1.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCU | None |
| Digital Mammography Processing | 1.2.840.10008.5.1.4.1.1.1.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian<br>JPEG Lossless Hier 14 | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2<br>1.2.840.10008.1.2.4.70 | SCU | None |

| | | | | | |
|---|---|---|---|---|---|
| VL Endoscopic | 1.2.840.10008.5.1.4.1.1.77.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| VL Microscopic | 1.2.840.10008.5.1.4.1.1.77.1.2 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| VL Photographic | 1.2.840.10008.5.1.4.1.1.77.1.4 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| VL Slide-Coordinates Microscopic | 1.2.840.10008.5.1.4.1.1.77.1.3 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Basic Text Structured Reporting SO | 1.2.840.10008.5.1.4.1.1.88.11 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Comprehensive Structured Reporting SOP | 1.2.840.10008.5.1.4.1.1.88.33 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Enhanced Structured Reporting SOP | 1.2.840.10008.5.1.4.1.1.88.22 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |
| Mammography CAD Structure Reporting SOP | 1.2.840.10008.5.1.4.1.1.88.50 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

Table 12 shows those transfer syntaxes for which there is limited supported by CADRAN_STORE_SCU. CADRAN ISM is able to receive images in these transfer syntax, but will not be able to translate them to another encapsulated syntax. Any images received in these transfer syntaxes will be stored in the transfer syntax in which they are received, and can only be transmitted by the STORE SCU in this same syntax.

**Table 12**

| Possibly Supported Transfer syntax list | |
|---|---|
| Name | UID |
| JPEG Extended 2 4 | 1.2.840.10008.1.2.4.51 |
| JPEG Extended 3 5 | 1.2.840.10008.1.2.4.52 |
| JPEG Spec Non-Hier 6 8 | 1.2.840.10008.1.2.4.53 |
| JPEG Spec Non-Hier 7 9 | 1.2.840.10008.1.2.4.54 |
| JPEG Full Prog Non-Hier 10 12 | 1.2.840.10008.1.2.4.55 |
| JPEG Full Prog Non-Hier 11 13 | 1.2.840.10008.1.2.4.56 |
| JPEG Lossless Non-Hier 14 | 1.2.840.10008.1.2.4.57 |
| JPEG Lossless Non-Hier 15 | 1.2.840.10008.1.2.4.58 |
| JPEG Extended Hier 16 18 | 1.2.840.10008.1.2.4.59 |
| JPEG Extended Hier 17 19 | 1.2.840.10008.1.2.4.60 |
| JPEG Spec Hier 20 22 | 1.2.840.10008.1.2.4.61 |
| JPEG Spec Hier 21 23 | 1.2.840.10008.1.2.4.62 |
| JPEG Full Prog Hier 24 26 | 1.2.840.10008.1.2.4.63 |
| JPEG Full Prog Hier 25 27 | 1.2.840.10008.1.2.4.64 |
| JPEG Lossless Hier 28 | 1.2.840.10008.1.2.4.65 |
| JPEG Lossless Hier 29 | 1.2.840.10008.1.2.4.66 |

#### 7.2.2.5 SOP Specific Conformance

The DICOM images sent by CADRAN_STORE_SCU AE conform to the standard DICOM IOD definitions (see PS3.3).

### *7.3 CADRAN_QR_SCP AE – Specification*

The CADRAN_QR_SCP AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 13 as a SCP.

**Table 13**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.5.1.4.1.2.2.1 | Study Root Query/Retrieve Information Model – Find |
| 1.2.840.10008.5.1.4.1.2.2.2 | Study Root Query/Retrieve Information Model – Move |
| 1.2.840.10008.5.1.4.1.2.1.1 | Patient Root Query/Retrieve Information Model – Find |
| 1.2.840.10008.5.1.4.1.2.1.2 | Patient Root Query/Retrieve Information Model – Move |
| 1.2.840.10008.5.1.4.1.2.3.1 | Patient/Study Only Root Query/Retrieve Information Model –Find |
| 1.2.840.10008.5.1.4.1.2.3.2 | Patient/Study Only Root Query/Retrieve Information Model –Move |

7.3.1 Association establishment policies

#### 7.3.1.1 General

The AE Title of the CADRAN_QR_SCP AE is a configurable parameter. The default title is “CADRAN_QR_SCP”.

The CADRAN_QR_SCP AE waits for an association as an SCP of the Query/Retrieve Services.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.3.1.2 Number of Associations

The CADRAN_QR_SCP AE will handled up to 5 query/retrieve SCP associations simultaneously.

#### 7.3.1.3 Asynchronous nature

The CADRAN_QR_SCP AE does not support asynchronous operations.

#### 7.3.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the CADRAN_QR_SCP AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the CADRAN_QR_SCP AE is:

**CCI178_M370IB5**

#### 7.3.1.5 Association initiation policy

The CADRAN_QR_SCP AE does not initiate associations.

#### 7.3.1.6 Association acceptance policy

The CADRAN_QR_SCP AE accepts associations for the query/retrieve services.

7.3.2 Real World Activity – Receive Echo

#### 7.3.2.1 Associated Real-World Activity – Reply to Echo Request

The associated activity is a C-ECHO request.

#### 7.3.2.2 Proposed Presentation Contexts

The CADRAN_QR_SCP AE will propose Presentation Contexts as shown in Table 14.

**Table 14**

| SCP Presentation Context Table | | | |
|---|---|---|---|
| Abstract Syntax | Transfer Syntax | Role | Extended |

| Name | UID | Name List | UID List | | Negotiation |
|---|---|---|---|---|---|
| Verification Service Class | 1.2.840.10008.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

#### 7.3.2.3 SOP Specific Conformance

The CADRAN_QR_SCP AE provides standard conformance to the DICOM Verification Service Class as a SCP.

### 7.3.3 Real World Activity – Receive Query from a Remote AE

#### 7.3.3.1 Associated Real-World Activity

The associated activity is an incoming C-FIND request. Following acceptance of the association the CADRAN_QR_SCP AE sends responses on the open association. Data within the responses is generated from the contents of the internal database.

#### 7.3.3.2 Accepted Presentation Contexts

CADRAN_QR_SCP AE will accept Presentation Contexts as shown in Table 15.

**Table 15**

| Query SCP Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Patient Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Study Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Patient/Study Only Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.3.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

#### 7.3.3.3 SOP Specific Conformance

CADRAN_QR_SCP AE accepts hierarchical queries only. Relational queries are not implemented.

The DICOM tags available for retrieval and searching are shown in Table 16, along with their associated query level.

**Table 16**

| Description | DICOM Tag | Patient/Study/Series/Image | Comment |
|---|---|---|---|
| Patient's ID | (0010,0010) | Patient/Study | Key |
| Patient's Name | (0010,0020) | Patient/Study | |
| Patient's Birth Date | (0010,0030) | Patient/Study | |
| Patient's Sex | (0010,0040) | Patient/Study | |
| Number of patient related Studies | (0020,1200) | Patient | Return only (no search) |
| Number of patient related Series | (0020,1202) | Patient | Return only (no search) |
| Number of patient related Images | (0020,1204) | Patient | Return only (no search) |
| Study Instance UID | (0020,000D) | Study | Unique Key |
| Modalities in Study | (0008,0061) | Study | Return only (no search) |
| Study Date | (0008,0020) | Study | |
| Study Time | (0008,0030) | Study | |
| Accession Number | (0008,0050) | Study | |
| Referring Physician's name | (0008,0090) | Study | |
| Study Description | (0008,1030) | Study | |
| Patient's Age | (0010,1010) | Study | Return only (no search) |
| Patient's Weight | (0010,1030) | Study | Return only (no search) |
| Study ID | (0020,0010) | Study | |

| | | | |
|---|---|---|---|
| Number of study related Series | (0020,1206) | Study | Return only (no search) |
| Number of study related Images | (0020,1208) | Study | Return only (no search) |
| Series Instance UID | (0020,000E) | Series | Unique Key |
| Modality | (0008,0060) | Series | |
| Series Description | (0008,103E) | Series | |
| Contrast/Bolus agent | (0018,0010) | Series | Return only (no search) |
| Body Part Examined | (0018,0015) | Series | Return only (no search) |
| Series Number | (0020,0011) | Series | |
| Number of Series related Images | (0020,1209) | Series | Return only (no search) |
| SOP InstanceUID | (0008,0018) | Image | Unique Key |
| Image Number | (0020,0013) | Image | |
| Image Position (Patient) | (0020,0032) | Image | Return only (no search) |
| Image Orientation (Patient) | (0020,0037) | | Return only (no search) |
| Retreive AE Title | (0008,0054) | Patient/Study/Series/Image | Return only (no search) |
| Instance Availability | (0008,0056) | Patient/Study/Series/Image | Return only (no search) |
| Storage Media File-set ID | (0008,0130) | Patient/Study/Series/Image | Return only (no search) |
| Storage Media File set UID | (0088,0140) | Patient/Study/Series/Image | Return only (no search) |

Note:

For versions of CADRAN ISM prior to 2.0, the AE Title of the local QR_SCP was returned as the Retreive AE Title, (0008,0054), and the Instance Avalablity (0008,0056), Storage Media File set ID (0008,0130) and Storage Media File Set UID (0088,0140) are never returned.

*For version of CARDAN ISM including and subsequent to version 2.0, the Storage Media File Set ID and Storage Media File Set UID for the tape upon which the data is located is returned, whenever the Instance Availability is "OFFLINE". When the Instance Availability is "ONLINE", the Retreive AE Title is returned as before. Note that if Instance Availability is "NEARLINE", then there may be a delay before the data is sent from the system.*

CADRAN ISM returns responses as shown in Table 17.

**Table 17**

| Service Status | Further Meaning | Comments | Status Codes | Related Fields |
|---|---|---|---|---|
| Refused | Out of resources | Database unavailable | A7xx | (0000,0092) |
| Error | Identifier does not match SOP Class | Incorrectly formed request | A9xx | (0000,0901)<br>(0000,0902) |
| Error | Cannot understand | Incomprehensible request | Cxxx | (0000,0901)<br>(0000,0902) |
| Cancel | Matching termated | Due to cancel request | FE00 | None |
| Success | Matching complete | No final identifier is supplied | 0000 | None |

7.3.4 Real World Activity – Move Images to a Remote AE

#### 7.3.4.1 Associated Real-World Activity

The associated activity is an incoming C-MOVE request. Following acceptance of the association the CADRAN_QR_SCP AE queries the database and sends the matching images to the requested AE.

#### 7.3.4.2 Accepted Presentation Contexts

CADRAN_QR_SCP AE will accept Presentation Contexts as shown inTable 18.

**Table 18**

| Move SCP Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Patient Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.1.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Study Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |
| Patient/Study Only Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.3.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

#### 7.3.4.3 SOP Specific Conformance

CADRAN_QR_SCP AE initiates C-STORE sub-operations as detailed in 7.1.4.

### *7.4 QR_Client AE – Specification*

The QR_CLIENT AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 19 as a SCU.

**Table 19**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.5.1.4.1.2.2.1 | Study Root Query/Retrieve Information Model – Find |
| 1.2.840.10008.5.1.4.1.2.2.2 | Study Root Query/Retrieve Information Model – Move |

7.4.1 Association establishment policies

#### 7.4.1.1 General

The AE Title of the QR_CLIENT AE is a configurable parameter. The default title is “CADRAN_QR_SCU”.

QR_CLIENT AE will attempt to establish an association when it is invoked from the user interface.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.4.1.2 Number of Associations

The QR_CLIENT AE will only initiate one association at a time.

#### 7.4.1.3 Asynchronous nature

The QR_CLIENT AE does not support asynchronous operations.

#### 7.4.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the QR_CLIENT AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the QR_CLIENT AE is:

**CCI178_M370IB5**

#### 7.4.1.5 Association initiation policy

The QR_CLIENT AE attempts to initiate an association for the following real world activity:

- The Query of objects on a Remote AE.

#### 7.4.1.6 Association Acceptance Policy

The QR_CLIENT AE does not accept associations

### 7.4.2 Real World Activity – Query a Remote AE

#### 7.4.2.1 Associated Real-World Activity

Querying is associated with the C-FIND request.

#### 7.4.2.2 Manual Operation

Querying is a manual operation performed from the user interface. The user may select the remote AE, the tpe of query and the desired keys from the available options. On initiation of the query from the user interface, an association is attempted with the remote AE. Once the association is established, QR_CLIENT will perform as many C-FIND requests as are necessary to complete the query. Ther results from the query, successful or otherwise are displayed in the user interface.

#### 7.4.2.3 Proposed Presentation Contexts

QR_CLIENT AE will propose presentation contexts as shown in Table 20.

**Table 20**

| Query SCU Presentation Context Table | | | |
|---|---|---|---|
| Abstract Syntax | Transfer Syntax | Role | Extended |

| Name | UID | Name List | UID List | | Negotiation |
|---|---|---|---|---|---|
| Study Root Query/Retrieve Information Model – FIND | 1.2.840.10008.5.1.4.1.2.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

### 7.4.2.4 SOP Specific Conformance

QR_CLIENT AE can request hierarchical queries only. Relational queries are not implemented. The keys available for display and searching are shwon in Table 21, along with the level of query required to retrieve them. A search may be initiated on those DICOM tags shown.

**Table 21**

| Description | DICOM Tag | Study/Series/Image | Comments |
|---|---|---|---|
| Patient's ID | (0010,0010) | Study | Search |
| Patient's Name | (0010,0020) | Study | Search |
| Patient's Birth Date | (0010,0030) | Study | Not displayed |
| Patient's Sex | (0010,0040) | Study | Not displayed |
| Study Instance UID | (0020,000D) | Study | Unique key |
| Modalities in Study | (0008,0061) | Study | Search |
| Study Date | (0008,0020) | Study | Search |
| Study Time | (0008,0030) | Study | Not displayed |
| Accession Number | (0008,0050) | Study | Not displayed |
| Referring Physician's name | (0008,0090) | Study | Not displayed |
| Study Description | (0008,1030) | Study | |
| Study ID | (0020,0010) | Study | Not displayed |
| Number of study related Series | (0020,1206) | Study | |

| | | | |
|---|---|---|---|
| Number of study related Images | (0020,1208) | Study | |
| Series Instance UID | (0020,000E) | Series | Unique Key |
| Modality | (0008,0060) | Series | |
| Series Description | (0008,103E) | Series | |
| Contrast/Bolus agent | (0018,0010) | Series | |
| Body Part Examined | (0018,0015) | Series | |
| Series Number | (0020,0011) | Series | |
| Number of Series related Images | (0020,1209) | Series | |
| SOP InstanceUID | (0008,0018) | Image | Unique Key |
| Image Number | (0020,0013) | Image | |
| Image Position (Patient) | (0020,0032) | Image | Not displayed |
| Image Orientation (Patient) | (0020,0037) | | Not displayed |

7.4.3 Real World Activity – Move Images from a Remote AE

#### 7.4.3.1 Associated Real-World Activity

Moving images from the remote AE after a query operation is associated with the C-MOVE request.

#### 7.4.3.2 Manual Operation

Moving is a manual operation which follows a query operation. The user may select the items to move from the results generated by the previous query. The user can also select the destination AE of the move operation. On initiation of the move from the user interface, an association is attempted with the remote AE. Following acceptance of the association, QR_CLIENT will perform as many C-MOVE requests

as are necessary to complete the move. The results from the move, successful or otherwise are displayed in the user interface.

#### 7.4.3.3 Proposed Presentation Contexts

QR_CLIENT AE will propose presentation contexts as shown in Table 22.

**Table 22**

| Move SCU Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Study Root Query/Retrieve Information Model – MOVE | 1.2.840.10008.5.1.4.1.2.2.1 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

### *7.5 CADRAN_PRINT_SCU AE – Specification*

The CADRAN_PRINT_SCU AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 23 as a SCU.

**Table 23**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.5.1.1.9<br>1.2.840.10008.5.1.1.1<br>1.2.840.10008.5.1.1.2<br>1.2.840.10008.5.1.1.4<br>1.2.840.10008.5.1.1.16 | Basic Grayscale Print Management (META)<br>Basic Film Session<br>Basic Film Box<br>Basic Grayscale Image Box<br>Printer |
| 1.2.840.10008.5.1.1.14 | Print Job |

7.5.1 Association establishment policies

#### 7.5.1.1 General

The AE Title of the CADRAN_PRINT_SCU AE is a configurable parameter, and may be obtained from the database. The default title is “CADRAN_PRINT_SCU”.

CADRAN_PRINT_SCU AE will attempt to establish an association when it is invoked from the user interface.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.5.1.2 Number of Associations

The CADRAN_PRINT_SCU AE will only initiate one association at a time.

#### 7.5.1.3 Asynchronous nature

The QR_CLIENT AE does not support asynchronous operations.

#### 7.5.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the CADRAN_PRINT_SCU AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the QR_CLIENT AE is:

**CCI178_M370IB5**

#### 7.5.1.5 Association initiation policy

The CADRAN_PRINT_SCU AE attempts to initiate an association for the following real world activity:

- The Printing of DICOM images on a Remote AE.

The CADRAN_PRINT_SCU AE initiates an association for the appropriate Print Services Class that corresponds to the set of images requested to be printed. The association is closed when all images have been printed and all print jobs have completed. The association is aborted should a time-out occur.

#### 7.5.1.6 Association Acceptance Policy

CADRAN_PRINT_SCU does not accept associations.

### 7.5.2 Real World Activity – Printing of DICOM images on a Remote AE

#### 7.5.2.1 Associated Real-World Activity

Once the Print Image association has been established, CADRAN_PRINT_SCU, sends a Basic Film Session, N_CREATE message to the Basic Print SCP. This is followed by an Basic Film Box, N_CREATE message. The CADRAN_PRINT_SCU then sends a Basic Grayscale Image Box, N_SET message. Finally, an N_ACTION message is sent to instruct the Basic Print SCP to print either at the Basic Film Session (if collation is supported by the remote SCP) or at the Basic Film Box level (if collation is not supported).

While the association with the remote SCP is open, CADRAN_PRINT_SCU will listen for and process N_EVENT_REPORT messages from the remote SCP. If the remote SCP supports the Print Job SOP Class, then the SCU will periodically poll the remote SCP for Print Job Status reports until all submitted print jobs are finished.

#### 7.5.2.2 Proposed Presentation Contexts

CADRAN_PRINT_SCU AE will propose presentation contexts as shown in Table 24.

**Table 24**

| Presentation Context Table | | | |
|---|---|---|---|
| Abstract Syntax | Transfer Syntax | Role | Extended |

| Name | UID | Name List | UID List | | Negotiation |
|---|---|---|---|---|---|
| Basic Grayscale Print Management (META) | 1.2.840.100008 .5.1.1.9 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU. | None |
| Print Job | 1.2.840.100008 .5.1.1.14 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

### 7.5.2.3 SOP Specific Conformance

Attribute values for SOP classes proposed by CADRAN_PRINT_SCU are specified in Table 25.

**Table 25**

| SOP Class Name | Command | Attribute name | Valid Range | Default |
|---|---|---|---|---|
| Basic Film Session | N_CREATE | Number of Copies | 1 | 1 |
| | | Medium Type | PAPER, CLEAR FILM, BLUE FILM | None |
| | | Film Destination | N/A | None |
| | | Film Session Label | N/A | None |
| | | Memory Allocation | N/A | None |
| | N_ACTION | Referenced Print Job Sequence | | None |
| Basic Film Box | N_CREATE | Image Display format | Customisable in software | STANDARD\1,1 |
| | | Film Orientation | PORTRAIT, LANDSCAPE | PORTRAIT |
| | | Film Size ID | N/A | None |
| | | Magnification Type | N/A | None |
| | | Max Density | N/A | None |
| | | Configuration Information | N/A | None |
| | | Smoothing Type | N/A | None |

| | | | | |
|---|---|---|---|---|
| | | Border Density | N/A | None |
| | | Empty Image Density | N/A | None |
| | | Min Density | N/A | None |
| | | Trim | N/A | None |
| | N_ACTION | Referenced Print Job Sequence | | None |
| Basic Greyscale image box | N_SET | Image Position | 1 | 1 |
| | | Samples per pixel | 1 | 1 |
| | | Photometric Interpretation | MONOCHROME2 | MONOCHROME2 |
| | | Rows | Customisable in software | None |
| | | Columns | Customisable in software | None |
| | | Pixel Aspect Ratio | 1/1 | 1/1 |
| | | Bits Allocated | Customisable in software | None |
| | | Bits Stored | Customisable in software | None |
| | | High Bit | Customisable in software | None |
| | | Pixel Representation | 0 | 0 |
| | | Polarity | N/A | None |
| | | Magnification Type | N/A | None |
| | | Smoothing Type | N/A | None |
| | | Requested Image Size | N/A | None |
| Printer | N_GET/ N_EVENT_REPORT | Printer Status | * | None |
| | | Printer Status Info | * | None |
| | | Printer Name | * | None |

| | | | | |
|---|---|---|---|---|
| | | Manufacturer | * | None |
| | | Manufacturer Model Number | * | None |
| | | Software Version | * | None |
| Print Job | N_EVENT_ REPORT | Execution Status | * | None |
| | | Execution Status Info | * | None |
| | | Print Priority | * | None |
| | | Creation Date | * | None |
| | | Creation Time | * | None |
| | | Printer Name | * | None |
| | | Originator | * | None |

## *7.6 CADRAN_WORK_SCP AE – Specification*

The CADRAN_WORKE_SCP AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 26 as an SCP.

**Table 26**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.1.1 | Verification SOP Class |
| 1.2.840.10008.5.1.4.31 | Modality Worklist Find |

### 7.6.1 Association establishment policies

#### 7.6.1.1 General

The AE Title of the CADRAN_WORK_SCP AE is a configurable parameter. The default title is “CADRAN_WORK_SCP”.

The CADRAN_STORE_SCP AE waits for an association as an SCP of the Worklist Query C-FIND operation.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

#### 7.6.1.2 Number of Associations

The CADRAN_WORK_SCP AE will handled up to 5 worklist SCP associations simultaneously.

#### 7.6.1.3 Asynchronous nature

The CADRAN_WORK_SCP AE does not support asynchronous operations.

#### 7.6.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the CADRAN_WORK_SCP AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the CADRAN_WORK_SCP AE is:

**CCI178_M370IB5**

#### 7.6.1.5 Association initiation policy

The CADRAN_WORK_SCP AE does not initiate associations.

#### 7.6.1.6 Association acceptance policy

The CADRAN_STORE_SCP AE accepts associations for the modality worklist find and verification services.

### 7.6.2 Real World Activity – Receive Echo

#### 7.6.2.1 Associated Real-World Activity – Reply to Echo Request

The associated activity is a C-ECHO request.

#### 7.6.2.2 Proposed Presentation Contexts

The CADRAN_WORK_SCP AE will propose Presentation Contexts as shown in Table 27.

**Table 27**

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

#### 7.6.2.3 SOP Specific Conformance

The CADRAN_WORK_SCP AE provides standard conformance to the DICOM Verification Service Class as a SCP.

## 7.6.3 Real World Activity – Receive Images from a Remote AE

### 7.6.3.1 Associated Real-World Activity

The associated activity is an incoming C-FIND request. Following acceptance of the association the CADRAN_WORK_SCP AE waits for conformant Modality Worklist Service messages. If a valid C-FIND is received then the local database is seached, and the requested information returned to the requestor.

### 7.6.3.2 Accepted Presentation Contexts

CADRAN_WORK_SCP AE will accept presentation contexts as shown in Table 28.

**Table 28**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Modality Worklist Find | 1.2.840.10008.5.1.4.31 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCP | None |

### 7.6.3.3 SOP Specific Conformance

The CADRAN_WORK_SCP AE conforms to the Modality Worklist Find SOP Class as an SCP. The DICOM tags available for retrieval and searching are shown in Table 29.

Those where Returned = “Y” in the table below are always sent to the remote SCU. Those where Returned = “N” in the table below are only sent to the remote SCU if present in the original C-Find request.

**Table 29**

| Description | DICOM Tag | Returned? | Search? |
|---|---|---|---|
| Study Instance UID | (0020,000D) | Y | N |
| Requested Procedure ID | (0040,1001) | Y | N |
| Requested Procedure Description | (0032,1060) | Y | Y |
| Requested Procedure Code Sequence | (0032,1064) | N | - |
| >Code Value | (0008,0100) | Y | Y |
| >Code Meaning | (0008,0104) | Y | Y |

| | | | |
|---|---|---|---|
| >Coding Scheme Designator | (0008,0102) | Y | N |
| Referring Physician's name | (0008,0090) | N | N |
| Requesting Physician | (0032,1032) | N | N |
| Accession Number | (0008,0050) | Y | N |
| Patients Name | (0010,0010) | Y | Y |
| Patients ID | (0010,0020) | Y | Y |
| Patients Birth Date | (0010,0030) | N | Y |
| Patients Sex | (0010,0040) | N | Y |
| Scheduled Procedure Step Sequence | (0040,0100) | Y | - |
| >Modality | (0008,0060) | Y | Y |
| >Scheduled Station AE | (0040,0001) | Y | Y |
| >Scheduled Procedure Start Date | (0040,0002) | Y | Y |
| >Scheduled Procedure Start Time | (0040,0003) | Y | Y |
| >Scheduled Performing Physicians Name | (0040,0006) | Y | Y |
| >Scheduled Procedure Step ID | (0040,0009) | Y | N |
| >Scheduled Procedure Step Description | (0040,0007) | Y | Y |
| >Scheduled Protocol Code Sequence | (0040,0008) | N | - |
| >>Code Value | (0008,0100) | Y | Y |
| >>Code Meaning | (0008,0104) | Y | Y |
| >>Coding Scheme Designator | (0008,0102) | Y | N |
| Confidentiality Constraint on Patient Data | (0040,3001) | N | N |

CADRAN_WORK_SCP AE returns responses as shown inTable 30.

**Table 30**

| Service Status | Further Meaning | Comments | Status Codes | Related Fields |
|---|---|---|---|---|
| Refused | Out of resources | Database unavailable | A7xx | (0000,0092) |
| Error | Cannot understand | Incomprehensible request | Cxxx | (0000,0901)<br>(0000,0902) |
| Cancel | Matching termated | Due to cancel request | FE00 | None |
| Success | Matching is complete | No final identifier will be supplied | 0000 | None |

## *7.7 CADRAN_WORK_SCU AE – Specification*

The CADRAN_WORK_SCU AE provides Standard Conformance to the DICOM V3.0 SOP Classes listed in Table 31 as a SCU.

**Table 31**

| SOP Class UID | SOP Class Name |
|---|---|
| 1.2.840.10008.5.1.4.31 | Modality Worklist Find – Find |

7.7.1 Association establishment policies

### 7.7.1.1 General

The AE Title of the CADRAN_WORK_SCU AE is a configurable parameter. The default title is “CADRAN_WORK_SCU”.

CADRAN_WORK_SCU AE will attempt to establish an association when it is invoked from the user interface.

The maximum PDU size is configurable from a minimum of 4,096 bytes.

### 7.7.1.2 Number of Associations

CADRAN_WORK_SCU will only initiate one association at a time.

### 7.7.1.3 Asynchronous nature

The CADRAN_WORK_SCU AE does not support asynchronous operations.

### 7.7.1.4 Implementation Identifying Information

The Implementation Class Unique Identifier (UID) for the CADRAN_WORK_SCU AE is:

**1.2.826.0.1.3680043.2.91.1.0.2.1**

The Implementation version name for the CADRAN_WORK_SCU AE is:

**CCI178_M370IB5**

#### 7.7.1.5 Association initiation policy

The CADRAN_WORK_SCU AE attempts to initiate an association for the following real world activity:

- The Query of objects on a Remote AE.

#### 7.7.1.6 Association Acceptance Policy

CADRAN_WORK_SCU does not accept associations.

### 7.7.2 Real World Activity – Query a Remote AE

#### 7.7.2.1 Associated Real-World Activity

Querying is associated with the C-FIND request.

#### 7.7.2.2 Manual Operation

Querying is a manual operation performed from the user interface. The user may select the remote AE, the type of query and the desired keys from the available options. On initiation of the query from the user interface, an association is attempted with the remote AE. Once the association is established, CADRAN_WORK_SCU will perform as many C-FIND requests as are necessary to complete the query. Ther results from the query, successful or otherwise are displayed in the user interface.

#### 7.7.2.3 Proposed Presentation Contexts

CADRAN_WORK_SCU AE will propose presentation contexts as shown in Table 32.

**Table 32**

| Presentation Context Table | | | | | |
|---|---|---|---|---|---|
| Abstract Syntax | | Transfer Syntax | | Role | Extended Negotiation |
| Name | UID | Name List | UID List | | |
| Modality Worklist Find | 1.2.840.10008.5.1.4.31 | Explicit VR Little Endian<br>Implicit VR Little Endian<br>Explicit VR Big Endian | 1.2.840.10008.1.2.1<br>1.2.840.10008.1.2<br>1.2.840.10008.1.2.2 | SCU | None |

#### 7.7.2.4 SOP Specific Conformance

The keys available for display and searching by CADRAN_WORK_SCU AE are shown in Table 33.

**Table 33**

| Description | DICOM Tag | Required? | Search? |
|---|---|---|---|
| Study Instance UID | (0020,000D) | Y | N- |
| Requested Procedure ID | (0040,1001) | Y | N |
| Requested Procedure Description | (0032,1060) | C | N |
| Referring Physician's name | (0008,0090) | N | N |
| Accession Number | (0008,0050) | N | N |
| Patients Name | (0010,0010) | Y | Y |
| Patients ID | (0010,0020) | Y | Y |
| Patients Birth Date | (0010,0030) | N | N |
| Patients Sex | (0010,0040) | N | N |
| Modality | (0008,0060) | Y | Y |
| Scheduled Station AE | (0040,0001) | Y | Y |
| Scheduled Procedure Start Date | (0040,0002) | Y | Y |
| Scheduled Procedure Start Time | (0040,0003) | Y | Y |
| Scheduled Performing Physicians Name | (0040,0006) | N | Y |
| Scheduled Procedure Step ID | (0040,0009) | Y | N |
| Scheduled Procedure Step Description | (0040,0007) | C | N |

# 8. Network Communication Profiles

## *8.1 Supported Communication Stacks*

CADRAN ISM provides DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard (PS 3.8 Network Communication Support for Message Exchange).

## *8.2 OSI Stack*

No OSI Stack communications are provided.

### *8.3 TCP/IP Stack*

CADRAN ISM inherits its TCP/IP stack from the operating system on which it executes. These are currently one of the following:

- Microsoft Windows NT4.0 Server
- Microsoft Windows NT4.0 Workstation
- Microsoft Windows 2000 Server
- Microsoft Windows 2000 Professional
- Microsoft Windows XP
- Microsoft Windows 2003

### *8.4 Physical media support*

CADRAN ISM is indifferent to the physical medium over which TCP/IP executes; it inherits this from the operating system on which it executes.

## 9. Extensions/Specializations/Privatizations

Not applicable.

## 10. Configuration

The CADRAN ISM products obtains their configuration information from the following files:

merge.ini - Identifies the other three configuration files and also contains message logging parameters. The location of this file is specified by specific register settings, which may be set as described in the operator's manual.

mergecom.pro - Defines run-time parameters for CADRAN ISM product applications, such as the network timeouts and PDU size, etc. **Most parameters in this file should never be changed, as doing so could disrupt the DICOM interface conformance.**

mergecom.app – Defines applications on other network nodes (such as supported image types, transfer syntaxes, application entities, etc.) to which connections are possible.

mergecom.srv - Service and sequence definitions. This file does not need to be altered, as long as standard DICOM image types are transferred. **Most parameters in this file should never be changed, as doing so could disrupt the DICOM interface conformance.**

## 11. AE Title / Presentation Address Mapping

Presentation address mapping for remote SCP's is configured in the mergecom.app file. This is where the Host Name, Port Number, and Application Title map an Application Entity (AE) Title to a Presentation Address in TCP/IP for the provider to

which you wish to connect is stored. The Presentation Address of local SCP and SCU's is defined as shown in the CADRAN ISM products operation manuals. Note: The host name maps to an IP address as specified by your host table. Generally port 104 should be used for standard connectivity; since this is the well-defined port for a DICOM server.

## 12. Support of Extended Character Sets

Not supported.