SeleCT series of CT scanners

DICOM Conformance Statement

Version 2.85

Marconi Medical Systems

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0 Introduction

0.1 The *SeleCT series* of CT scanners

The *SeleCT series* of CT scanners provides CT acquisition and reconstruction, analysis, manipulation, display, storage and retrieval of images.

Communication is based on the DICOM v3.0 standard. This enables the system to communicate with any DICOM v3.0 compliant products (e.g., scanners, workstations, hardcopy units). The system can function both as a server and as a client. Thus it can send and retrieve images from other stations, and other stations can retrieve and send images to and from it. Images are transferred in the DICOM v3.0 protocol based on TCP/IP as a transport layer.

0.2 About this Document

This document provides the DICOM Conformance Statement for the *SeleCT series* implementation of the DICOM-3.0 standard. Conformance Statement define the subset of options selected from those offered by the DICOM v3.0 standard. Copies of the DICOM v3.0 standard may be obtained by written request or phone by contacting:

> NEMA Publication
> 2101 L Street, N.W., Suite 300
> Washington, DC 20037 USA
> Phone: (202) 457-8474

It is assumed that the reader of this document is familiar with the DICOM v3.0 standard and with the terminology and concepts which are used in the standard.

0.3 Important Remarks

The use of this Conformance Statement, in conjunction with the DICOM v3.0 standard, is intended to facilitate communication with the *SeleCT series* workstation. However, by itself, it is not sufficient to ensure that inter-operation will be successful. The user needs to proceed with caution and be aware of at least the following issues:

- It is the user's responsibility to analyze the applications requirements and to design a solution that integrates the system properly with the network. The integration of any DICOM compliant device into an existing network goes beyond the scope of the standard.

- Testing the complete range of possible interactions between the system and other devices should not be overlooked by the user. This includes the accuracy of the image data once it has crossed the interface between the system and the other device, and the suitability of the

image data for the intended applications. Such a validation is required before any clinical use is performed.

- Evolution of the DICOM v3.0 standard may require changes to devices which have implemented it, such as the *SeleCT series* workstation. The user should ensure that other DICOM products in the network are also updated as the standard evolves.

If the user encounters unspecified private data elements while parsing a data set coming from the workstation, the user is well advised to ignore those data elements (per the DICOM v3.0 standard). Unspecified private data element information is subject to change without notice.

1 Implementation Model

The *SeleCT series* of CT scanners uses the DICOM protocol to enable the following functions:

- Access to its data base

- Loading of image to its memory

- Printing on non-DICOM imagers

The *SeleCT series* also uses the DICOM protocol to implement the following services:

- Query remote data bases

- Retrieve images from remote data bases

- Store images to remote data bases

- Print images on a remote printer server

1.1 Application Data Flow Diagram

The *SeleCT series* implements and provides DICOM services using the following Application Entities:

1. Disk-Server

2. Marconi-CT-Server

3. Memory-Server

4. Print-Server

5. Archive-Manager

6. Memory-Manager

7. Queue-Manager

8. Print-Manager

1.1.1 Disk-Server

This Application Entity (AE) serves as the interface to the data base of the stored images on the local hard disk. This Service Class Provider (SCP) provides DICOM Storage and Query-Retrieve services. The same AE may be used (with a configurable different AE title) to access the local EOD (Erasable Optical Disk). Figure 1 provides an illustration of Disk Server activities.
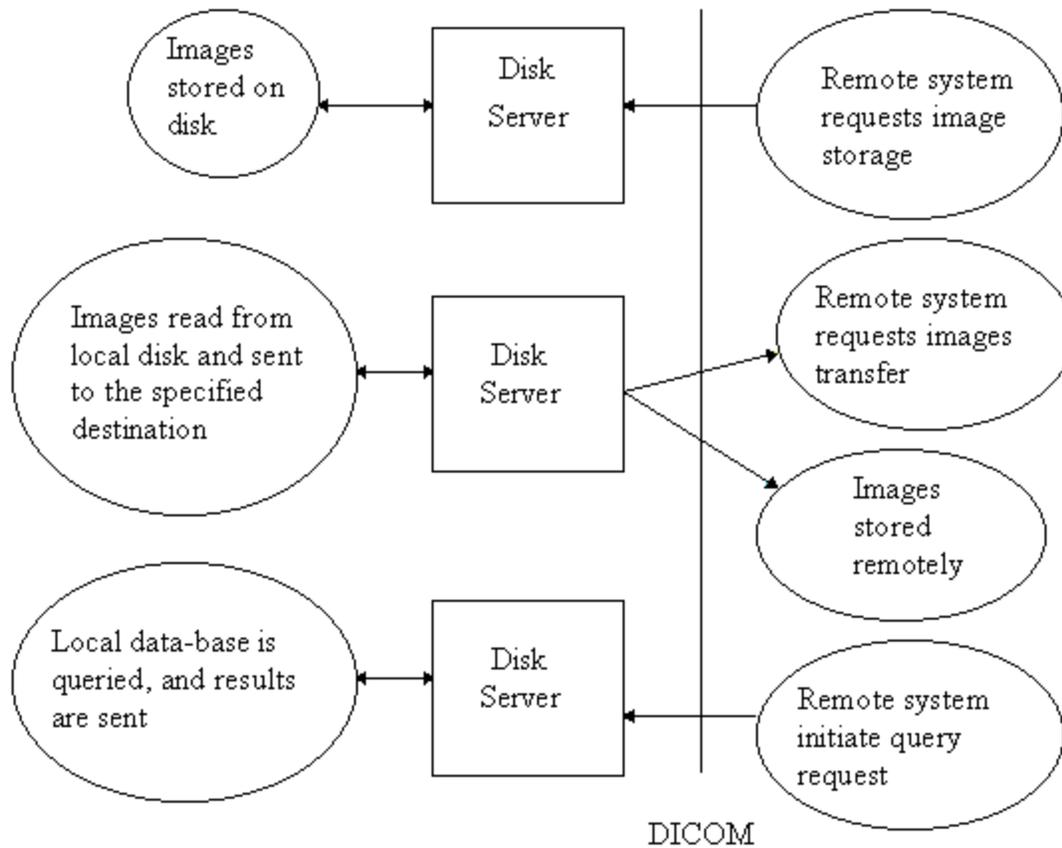
Figure 1: Illustration of Disk-Server Activities.

1.1.2 (Reserved)

1.1.3 Memory-Server

This AE serves as the interface to the system's memory by providing the DICOM Storage service. It is used by the system to load images to its own memory. The SeleCT series system assigns this AE as the target AE of C-MOVE requests it issues when loading images from remote systems. Figure 2 provides an illustration of Memory-Server activities.
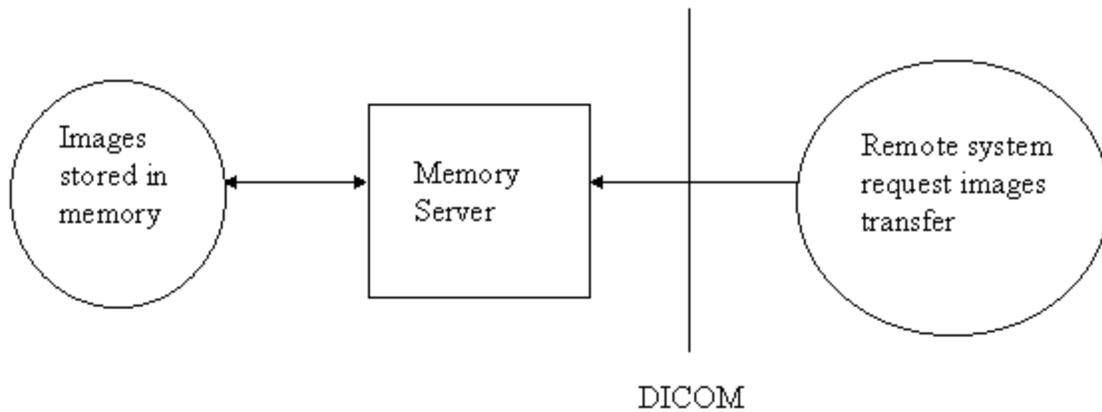
Figure 2: Illustration of Memory-Server Activities.

1.1.4 Print-Server

This AE enables an SCU to print on a non-DICOM printer by providing it the services of a DICOM Print Management service class. Figure 3 provides an illustration of Print-Server activities.
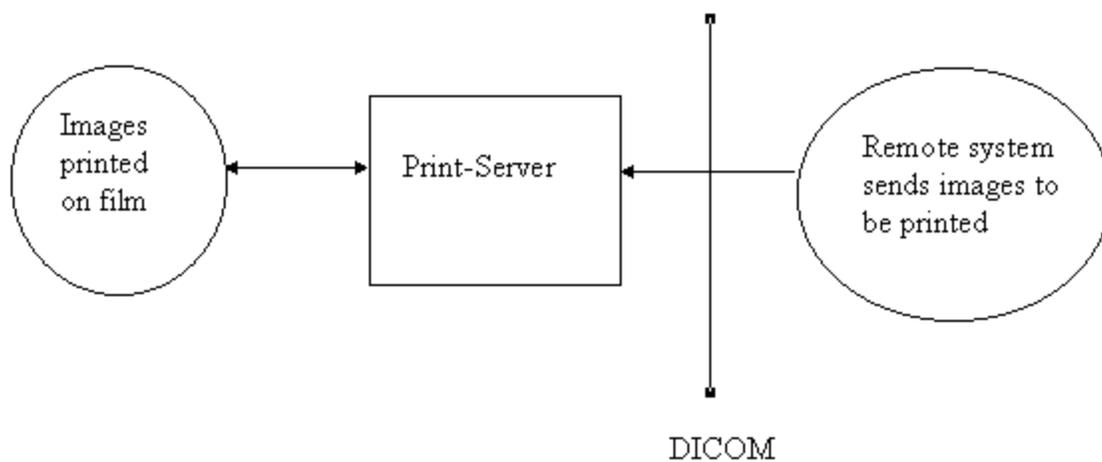
Figure 3: Illustration of Print-Server Activities.

1.1.5 Archive-Manager

This AE is an SCU used to query the contents of remote data bases. The results are presented to the user on the screen. Figure 4 provides an illustration of Archive-Manager activities.
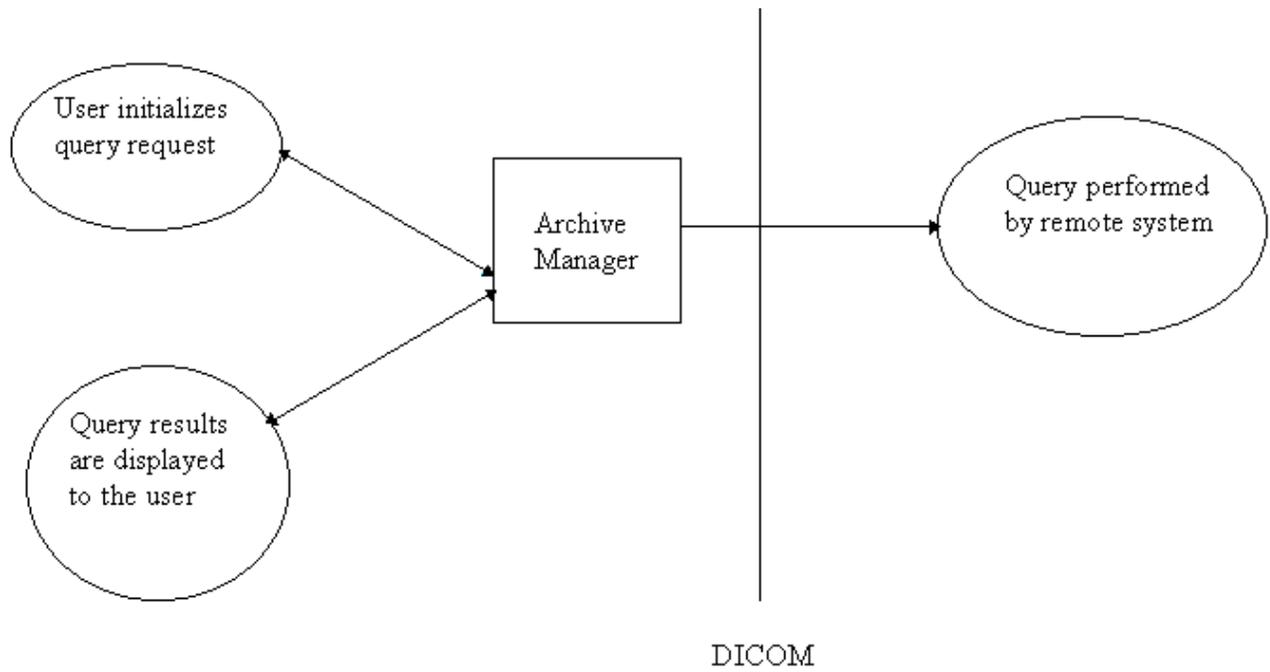
Figure 4: Illustration of Archive-Manager Activities.

1.1.6   Memory-Manager

This AE is an SCU used to load images to the system's memory from remote data bases. Figure 5 provides an illustration of Memory-Manager activities.
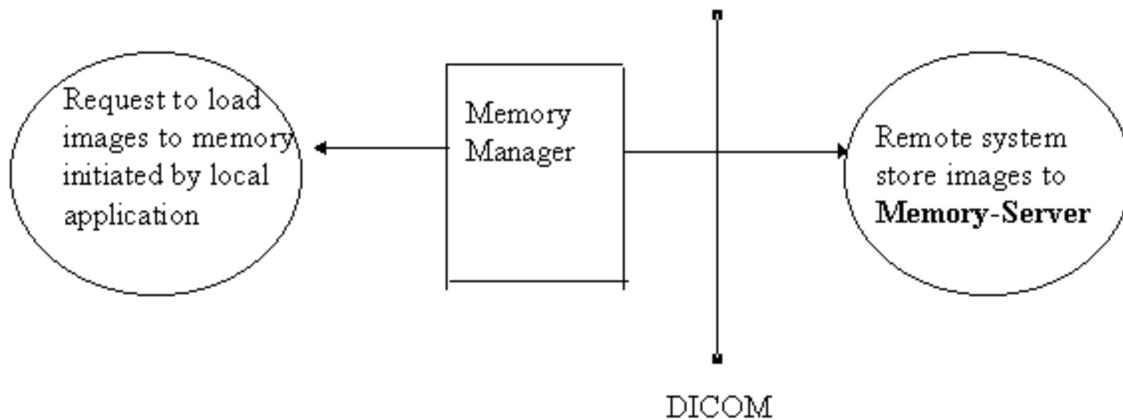
Figure 5: Illustration of Memory-Manager Activities.

1.1.7   Queue-Manager

This AE is an SCU used to move images between data bases. Figure 6 provides an illustration of Queue-Manager activities.
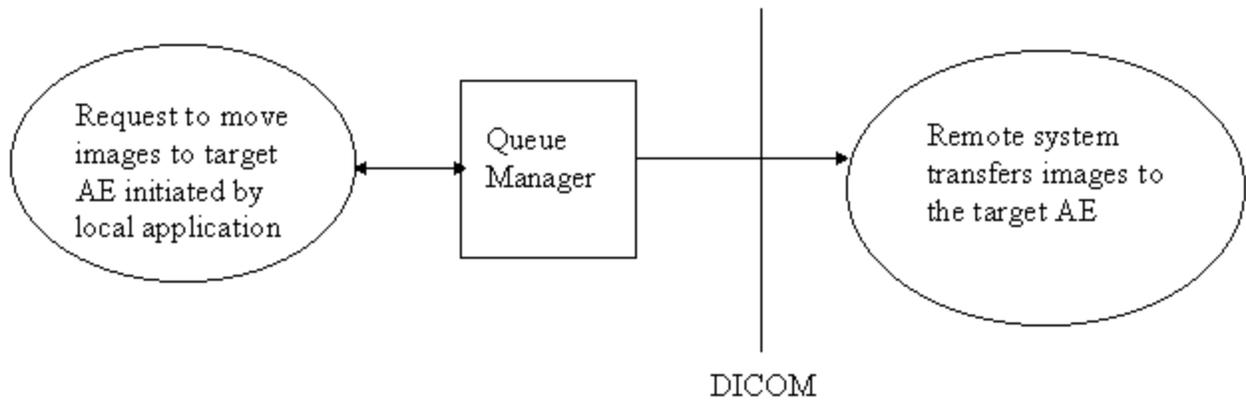
Figure 6: Illustration of Queue-Manager Activities.

1.1.8 Print-Manager

This AE is an SCU used to print images on imagers. Figure 7 provides an illustration of Print-Manager activities.
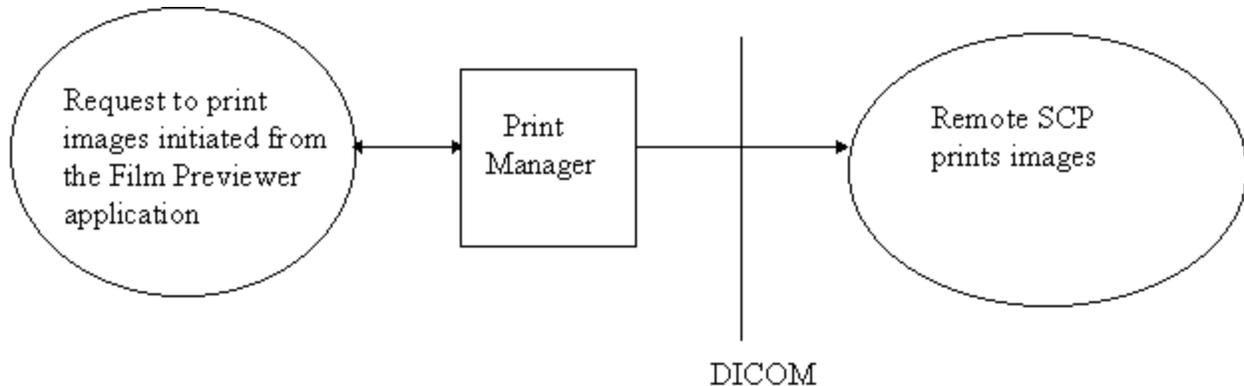
Figure 7: Illustration of Print-Manager Activities.

1.2   Functional Definitions of AE's

1.2.1 Disk-Server

Disk-Server waits for another application to connect at the presentation address configured for its AE title. **Disk-Server** will accept associations with Presentation Contexts for Service Object Pair (SOP) classes of the Storage, Query-Retrieve (C-MOVE and C-FIND only) and Verification Service Classes.

When performing a Storage Service Class, **Disk-Server** will receive images and store them into the system's disk.

When performing Query-Retrieve Service Class (C-FIND), **Disk-Server** will query its data base according to the request's parameters, and will send the results to the issuer.

When performing Query-Retrieve Service Class (C-MOVE), **Disk-Server** will issue a C-STORE (to the target AE) for every image in the request.

1.2.2 (Reserved)

1.2.3 Memory-Server

Memory-Server waits for another application to connect at the presentation address configured for its AE title. **Memory-Server** will accept associations with Presentation Contexts for SOP classes of the

Storage and Verification Service Classes. It will receive images on these Presentation Contexts and load them into the system's memory.

1.2.4 Print-Server

Print-Server waits for another application to connect at the presentation address configured for its AE title. **Print-Server** will accept associations with Presentation Context for the Print Management and Verification Service Classes. It may receive images from one or more SCUs.

1.2.5 Archive-Manager

The **Archive-Manager i**s a GUI (Graphical User-Interface) based application. It enables the user to perform queries using the DICOM protocol. The **Archive-Manager** lets the user select from a list of devices. It uses a configuration file to associate each device with a DICOM Application Entity. Using the GUI, the user can initiate the following activities:

- Establish an association with a remote AE.

- Release an association with a remote AE.

- Query for studies (using the Study Root model).

- Query for series (using the Study Root model).

- Query for images (using the Study Root model).

1.2.6 Memory-Manager

The **Memory-Manager** is responsible for loading images into memory. The **Memory-Manager** gets requests from local image processing and display applications to load images to the memory. It performs these requests using the Query-Retrieve Service Class (C-MOVE only). The **Memory-Manager** can perform the following activities:

- Establish an association with a remote AE.

- Release an association with a remote AE.

- Issue a C-MOVE request (using the Study Root model) where the target AE is **Memory-Server.**

1.2.7 Queue-Manager

The **Queue-Manager** is responsible for transferring images between devices in batch mode. The **Queue-Manager** gets transfer requests from the **Memory-Manager** and the **Archive-Manager** (using a proprietary non-DICOM protocol). It performs these requests using the Query-Retrieve Service Class (C-MOVE). The **Queue-Manager** can perform the following activities:

- Establish an association with a remote AE.

- Release an association with a remote AE.

- Issue a C-MOVE request (using the Study Root model) for any desired target AE.

1.2.8 Print-Manager

The **Print-Manager** is a Graphical User Interface (GUI) based application   It enables the user to print predefined images using the DICOM protocol. The user can specify as a printing destination one of several predefined printers. The user can also modify some of the printing parameters such as the film size and format.

1.3   Sequencing of Real World Activities

Real world activities of the **Print-Server** and the **Print-Manager** are sequenced as required to meet the definition of the Print-Management Service Class. SCUs can modify and/or delete previously defined film boxes (i.e., not only the currently open one).

2 AE Specifications

2.1 Disk-Server Specifications

Disk-Server provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

SOP Class Name	SOP Class UID
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

and to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Study Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

2.1.1 Association Establishment Policies

2.1.1.1   General

The maximum Protocol Data Unit (PDU) size which the **Disk-Server** will use is configurable, with a minimum of 2K byte.

2.1.1.2   Number of Associations

The number of simultaneous associations which will be accepted by **Disk-Server** is limited only by the kernel parameters of the underlying TCP/IP implementation. **Disk-Server** will spawn a new process for each connection request it receives. Therefore, **Disk-Server** can have multiple simultaneous connections, and there are no inherent limitations on the number of simultaneous associations which the Application Entity represented by **Disk-Server** can maintain.

2.1.1.3   Asynchronous Nature

Disk-Server will only allow a single outstanding operation on an association. Therefore **Disk-Server** will not perform asynchronous operations window negotiation.

2.1.1.4   Implementation Identifying Information

Disk-Server provides a single Implementation Class Unique IDentifier (UID) which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.1.2 Association Initiation by Real-World Activity

Disk-Server initiates an association as part of an execution of a C-MOVE command.

2.1.2.1   Remote system Requests Image Transfer

A remote system requests image transfer from **Disk-Server** by sending C-MOVE Command.

2.1.2.1.1 Associated Real World Activity

The Real World activity associated with the C-MOVE command is retrieval of images from the disk and storage of the images to a remote system using a C-STORE command.

2.1.2.1.2 Proposed Presentation Contexts

All the Presentation Contexts shown in Table 2.1 are proposed by **Disk-Server**:

Table 2.1: Proposed Presentation Contexts for Disk-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	U	Name	UID		
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Implicit VR Little Endian DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Implicit VR Little Endian DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Implicit VR Little Endian DICOM Explicit VR Little Endian DICOM Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.1.2.1.2.1   SOP Specific Conformance Statement for Storage SOP Class

Disk-Server provides standard conformance to the DICOM V3.0 Storage Service Class as an SCU for the following SOP Classes:

- CT Image Storage, UID = 1.2.840.10008.5.1.4.1.1.2.
- MR Image Storage, UID = 1.2.840.10008.5.1.4.1.1.4.
- CR Image Storage , UID = 1.2.840.10008.5.1.4.1.1.1
- NM Image Storage, UID = 1.2.840.10008.5.1.4.1.1.20
- SC Image Storage, UID = 1.2.840.10008.5.1.4.1.1.7.

Multiple C-STORE operations can be performed over a single association.

Upon receiving a C-STORE confirmation containing a successful status, this implementation will perform the next C-STORE operation. The association will be maintained if possible.

Any unsuccessful status, returned in the C-STORE confirmation, results in termination of the association over which the C-STORE has been sent, reporting of error to the system log file, and returning of a status code of **A702** ("Refused") in the C-MOVE confirmation.

There are no timeouts implemented in this process.

2.1.3 Association Acceptance Policy

Disk-Server places no limitations on the number of simultaneous connections it will support. However, it is possible to control who may connect to **Disk-Server** during the system configuration process.

2.1.3.1   Remote System Requests Verification

A remote system requests verification from **Disk-Server** using the C-ECHO command.

2.1.3.1.1 Associated Real World Activity

Disk-Server performs the Verification Service Class by responding with C-ECHO-RSP.

2.1.3.1.2 Presentation Context Table

Any of the Presentation Contexts shown in Table 2.2 is acceptable to the **Disk-Server.**

Table 2.2: Acceptable Presentation Contexts for Disk-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.1.3.1.2.1   SOP Specific Conformance to Verification SOP Class

Disk-Server provides standard conformance to the DICOM V3.0 Verification Service Class as an SCP for the Verification SOP Class, UID=1.2.840.10008.1.1.

2.1.3.1.3 Presentation Context Acceptance Criterion

Disk-Server will accept any Presentation Context from Table 2.2.

2.1.3.1.4 Transfer Syntax Selection Policies

Disk-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1. DICOM Explicit VR Big Endian.

2. DICOM Explicit VR Little Endian.

3. DICOM Implicit VR Little Endian (Default).

2.1.3.2   Remote System Requests Image Storage

A remote system requests image storage from **Disk-Server** using the C-STORE command.

2.1.3.2.1 Associated Real World Activity

The Real World activity associated with the C-STORE operation is the storage of the image in the disk. **Disk-Server** will issue a failure status if it is unable to store the image in the disk.

2.1.3.2.2 Presentation Context Table

Any of the Presentation Contexts shown in Table 2.3 is acceptable to the **Disk-Server**.

2.1.3.2.2.1 SOP Specific Conformance to Storage SOP Class

Disk-Server provides standard conformance to the DICOM V3.0 Storage Service Class as an SCP for the following SOP Classes:

- CT Image Storage, UID=1.2.840.10008.5.1.4.1.1.2.

- MR Image Storage, UID=1.2.840.10008.5.1.4.1.1.4.

- CR Image Storage , UID = 1.2.840.10008.5.1.4.1.1.1

- NM Image Storage, UID = 1.2.840.10008.5.1.4.1.1.20

- SC Image Storage, UID=1.2.840.10008.5.1.4.1.1.7.

Disk-Server conforms to the SOPs of the Storage Service Class at Level 2 (Full).

In case of a successful C-STORE, the stored image may be accessed by the **Disk-Server**.

The duration of the storage is determined by the user of the workstation, who can delete any image using the Archive Manager application. An auto-delete mechanism can be utilized to remove the least recently accessed images in order to make room for new ones. This mechanism is optional and is controlled by user configurable parameters.

Disk-Server will not coerce any attribute except for the following: pixel data (0x7FE0, 0x0010) of type OW is converted to OB when bits allocated (0x0028, 0x0100) equal 8.

If **Disk-Server** returns one of the following status codes, it means that the C-STORE has been unsuccessful:

A700 - General refusal status.

A701 - Out of disk space.

B000 - General warning status.

C000 - General failure status.

Recovery from this condition is the responsibility of the **Disk-Server**.

2.1.3.2.3 Presentation Context Acceptance Criterion

Disk-Server will accept any Presentation Context from Table 2.3.

Table 2.3: Acceptable Presentation Contexts for Disk-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.1.3.2.4 Transfer Syntax Selection Policies

Disk-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1. DICOM Explicit VR Big Endian.
2. DICOM Explicit VR Little Endian.

3.   DICOM Implicit VR Little Endian (Default).

2.1.3.3   Remote System Requests Image Transfer

A remote system requests image transfer from **Disk-Server** using the C-MOVE command.

2.1.3.3.1 Associated Real World Activity

The Real World activity associated with the C-MOVE command is retrieval of images from the disk and storage of the images to a remote system using a C-STORE command.
Disk-Server will issue a failure status if it is unable to process the transfer request.

2.1.3.3.2 Presentation Context Table

Any of the Presentation Contexts shown in Table 2.4 is acceptable to the **Disk-Server**:

Table 2.4: Acceptable Presentation Contexts for Disk-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Study MOVE	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root MOVE	1.2.840.10008.5.1.4.1.2.2.2	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root MOVE	1.2.840.10008.5.1.4.1.2.2.2	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.1.3.3.2.1   SOP Specific Conformance to Study Root MOVE

Disk-Server provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - MOVE, UID=1.2.840.10008.5.1.4.1.2.2.2.

Prioritization of C-MOVE requests is not supported.

Disk-Server does not support relational C-MOVE requests.

All images requested in the C-MOVE will be sent over a single association (the association will not be established and torn down for each image).

If **Disk-Server** returns one of the following status codes, it means that the C-MOVE has been unsuccessful:

A702 - Refused. Unable to perform sub operation (due to failure of a C-STORE).

A802 - Refused. Move destination unknown.

A700 - General refusal status.

B000 - General warning status.

C000 - General failure status.

2.1.3.3.3   Presentation Context Acceptance Criterion

Disk-Server will accept any Presentation Context from Table 2.4.

2.1.3.3.4   Transfer Syntax Selection Policies

Disk-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1.   DICOM Explicit VR Big Endian.

2.   DICOM Explicit VR Little Endian.

3.   DICOM Implicit VR Little Endian (Default).

2.1.3.4   Remote System Initiates Query Request

A remote system initiates query request using the C-FIND command.

2.1.3.4.1   Associated Real World Activity

The Real World activity associated with the C-FIND command is an examination of the disk content. **Disk-Server** will issue a failure status if it is unable to process the query request.

2.1.3.4.2 Presentation Context Table

Any of the Presentation Contexts shown in Table 2.5 is acceptable to the **Disk-Server**.

Table 2.5: Acceptable Presentation Contexts for Disk-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.1.3.4.2.1 SOP Specific Conformance to Study Root FIND

Disk-Server provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCP for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID=1.2.840.10008.5.1.4.1.2.2.1.

Disk-Server does not support Relational Search.

All Required (R) and Unique (U) Study, Series and Image level keys for the Study Root Query/Retrieve Information Model are supported. **Disk-Server** supports the following optional keys:

- Series Data (0008,0021)
- Series Time (0008,0031)
- Frame Of Reference UID (0020,0052)
- SOP Class UID (0008,0016)
- Image Date (0008,0023)
- Image Time (0008,0033)
- Image Type (0008,0008)
- Acquisition Number (0020,0012)
- Pixel Spacing (0028,0030)
- Image Orientation (0020,0037)
- Image Position (0020,0032)
- Slice Thickness (0018,0050)

- Slice Location (0020,1041)

- Rows (0028,0010)

- Columns (0028,0011)

- Contrast Bolus Agent (0018,0010)

- Scan Options (0018,0022)

Unsupported fields will not be returned in the C-FIND response.

C-FIND-CANCEL is supported. However, some C-FIND responses may be forwarded before the C-FIND-CANCEL takes effect.

If **Disk-Server** returns one of the following status codes, it means that the C-FIND has been unsuccessful:

A700 - General refusal status.

B000 - General warning status.

C000 - General failure status.

2.1.3.4.3 Presentation Context Acceptance Criterion

Disk-Server will accept any Presentation Context from Table 2.5.

2.1.3.4.4 Transfer Syntax Selection Policies

Disk-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1. DICOM Explicit VR Big Endian.

2. DICOM Explicit VR Little Endian.

3. DICOM Implicit VR Little Endian (Default).

2.2 (Reserved)

2.3　Memory-Server Specifications

Memory-Server provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7

2.3.1　Association Establishment Policies

2.3.1.1　General

The maximum PDU size which the **Memory-Server** will use is configurable, with a minimum of 2K byte.

2.3.1.2　Number of Associations

The number of simultaneous associations which will be accepted by **Memory-Server** is limited only by the kernel parameters of the underlying TCP/IP implementation. **Memory-Server** will spawn a new process for each connection request it receives. Therefore, **Memory-Server** can have multiple simultaneous connections, and there are no inherent limitations on the number of simultaneous associations which the Application Entity represented by **Memory-Server** can maintain.

2.3.1.3　Asynchronous Nature

Memory-Server will only allow a single outstanding operation on an association. Therefore **Memory-Server** will not perform asynchronous operations window negotiation.

2.3.1.4　Implementation Identifying Information

Memory-Server provides a single Implementation Class UID which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.3.2　Association Initiation by Real-World Activity

Memory-Server never initiates an association.

2.3.3 **Association Acceptance Policy**

Memory-Server places no limitations on the number of simultaneous connections it will support. However, it is possible to control who may connect to **Memory-Server** during the workstation's configuration process.

2.3.3.1   **Remote System Requests Verification**

A remote system requests verification from **Memory-Server** using the C-ECHO command.

2.3.3.1.1 **Associated Real World Activity**

Memory-Server performs the Verification Service Class by responding with C-ECHO-RSP.

2.3.3.1.2 **Presentation Context Table**

Any of the Presentation Contexts shown in Table 2.10 is acceptable to **Memory-Server:**

Table 2.10: Acceptable Presentation Contexts for Memory-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.3.3.1.2.1   **SOP Specific Conformance to Verification SOP Class**

Memory-Server provides standard conformance to the DICOM V3.0 Verification Service Class as an SCP for the Verification SOP Class, UID=1.2.840.10008.1.1.

2.3.3.1.3 **Presentation Context Acceptance Criterion**

Memory-Server will accept any Presentation Context from Table 2.10.

2.3.3.1.4 Transfer Syntax Selection Policies

Memory-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1. DICOM Explicit VR Big Endian.

2. DICOM Explicit VR Little Endian.

3. DICOM Implicit VR Little Endian (Default).

2.3.3.2   Remote System Requests Image Transfer

A remote system requests image transfer from **Memory-Server,** as a result of a C-MOVE command issued by the **Memory-Manager**.

2.3.3.2.1 Associated Real World Activity

The Real World activity associated with the C-STORE operation is the storage of the image in the memory of the system upon which **Memory-Server** is running. **Memory-Server** will issue a failure status if it is unable to store the image in the memory.

2.3.3.2.2 Presentation Context Table

Any of the Presentation Contexts shown in table 2.11 is acceptable to the **Memory-Server:**

2.3.3.2.2.1   SOP Specific Conformance to Verification SOP Class

Memory-Server provides standard conformance to the DICOM V3.0 Storage Service Class as an SCP for the following SOP Classes:

- CT Image Stor, UID=1.2.840.10008.5.1.4.1.1.2.

- MR Image Storage, UID=1.2.840.10008.5.1.4.1.1.4.

- CR Image Storage , UID = 1.2.840.10008.5.1.4.1.1.1

- NM Image Storage, UID = 1.2.840.10008.5.1.4.1.1.20

- SC Image Storage, UID=1.2.840.10008.5.1.4.1.1.7.

Memory-Server conforms to the SOPs of the Storage Service Class at Level 2 (Full). In case of a successful C-STORE, the stored image may be accessed by the **Memory-Manager.**

The duration of the storage is determined by the user.

Recovery from this condition is the responsibility of the **Memory-Manager.**

If **Memory-Server** returns one of the following status codes, it means that the C-STORE has been unsuccessful:

A700 -General refusal status.

B000 - General warning status.

C000 - General; failure status.

2.3.3.2.3 Presentation Context Acceptance Criterion

Memory-Server will accept any Presentation Context from Table 2.11.

Table 2.11: Acceptable Presentation Contexts for Memory-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
CT Image	1.2.840.10008.5.1.4.1.1.2	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
MR Image	1.2.840.10008.5.1.4.1.1.4	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
NM Image	1.2.840.10008.5.1.4.1.1.20	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
CR Image	1.2.840.10008.5.1.4.1.1.1	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
SC Image	1.2.840.10008.5.1.4.1.1.7	DICOM Explicit VR	1.2.840.10008.1.2.2	SCP	None

		Big Endian			

2.3.3.2.4 Transfer Syntax Selection Policies

Memory-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1. DICOM Explicit VR Big Endian.

2. DICOM Explicit VR Little Endian.

3. DICOM Implicit VR Little Endian (Default).

2.4   Print-Server Specifications

Print-Server provides Standard Conformance to the following DICOM V3.0 Meta SOP Classes and DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
Basic Greyscale Print Management	1.2.840.10008.5.1.1.9
Print Job	1.2.840.10008.5.1.1.14

Support for the Basic Greyscale Print Management Meta SOP Class as an SCP also implies support for the following SOP Classes as an SCP. However, the **Print-Server** shall not accept individual Presentation Contexts for these SOP Classes.

SOP Class Name	SOP Class UID
Basic Film Session	1.2.840.10008.5.1.1.1.
Basic Film Box	1.2.840.10008.5.1.1.2.
Basic Grayscale Image Box	1.2.840.10008.5.1.1.4
Printer	1.2.840.10008.5.1.1.16

2.4.1 Association Establishment Policies

2.4.1.1   General

The maximum PDU size which the **Print-Server** will use is configurable, with a minimum of 2K byte.

2.4.1.2   Number of Associations

The number of simultaneous associations which will be accepted by **Print-Server** is limited only by the kernel parameters of the underlying TCP/IP implementation. **Print-Server** will spawn a new process for each connection request it receives. Therefore, **Print-Server** can have multiple simultaneous

connections, and there are no inherent limitations on the number of simultaneous associations which the Application Entity represented by **Print-Server** can maintain.

2.4.1.3   Asynchronous Nature

Print-Server will only allow a single outstanding operation on an association. Therefore **Print-Server** will not perform asynchronous operations window negotiation.

2.4.1.4   Implementation Identifying Information

Print-Server provides a single Implementation Class UID which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.4.2   Association Initiation by Real-World Activity

Print-Server never initiates an association.

2.4.3   Association Acceptance Policy

Print-Server places no limitations on the number of simultaneous connections it will support. However, it is possible to control who may connect to **Print-Server** during the workstation's configuration process.

2.4.3.1   Remote system Requests Image Transfer

A remote system requests image transfer from **Print-Server** by sending a C-ECHO command.

2.4.3.1.1 Associated Real World Activity

Print-Server performs the Verification Service Class by responding with C-ECHO-RSP.

2.4.3.1.2 Presentation Context Table

Any of the Presentation Contexts shown in Table 2.12 is acceptable to the **Print-Server**.

Table 2.12: Acceptable Presentation Contexts for Print-Server

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Verification	1.2.840.10008.1.1	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None

| Verification | 1.2.840.10008.1.1 | DICOM Explicit VR Big Endian | 1.2.840.10008.1.2.2 | SCP | None |

2.4.3.1.2.1   SOP Specific Conformance to Verification SOP Class

Print-Server provides standard conformance to the DICOM V3.0 Verification Service Class as an SCU for the Verification SOP Class, UID=1.2.840.10008.1.1.

2.4.3.1.3 Presentation Context Acceptance Criterion

Print-Server will accept any Presentation Context from Table 2.12.

2.4.3.1.4 Transfer Syntax Selection Policies

Print-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1.   DICOM Explicit VR Big Endian.

2.   DICOM Explicit VR Little Endian.

3.   DICOM Implicit VR Little Endian (Default).

2.4.3.2   Remote System Requests Image Transfer

A remote system requests image transfer from **Print-Server** by creating film sessions, film boxes and image boxes, changing their attributes and requesting the film boxes (or sessions) to be printed as defined in part 4 of the standard.

2.4.3.2.1 Associated Real World Activity

The Real World activity associated with the image printing request is the printing of the images on the printer which is associated with the current **Print-Server** instance. **Print-Server** does not support attributes values that are not supported by the associated printer. The valid attributes values as well as the default values used for the associated printer are defined in a printer capabilities configuration file'. **Print-Server** will issue a failure status if it is unable to handle the printing request properly.

2.4.3.2.2 Presentation Context Table

Any of the Presentation Contexts shown in Table 2.13 is acceptable to the **Print-Server:**

Table 2.13: Acceptable Presentation Contexts for Print-Server

Abstract Syntax	Transfer Syntax	Role	Ext. Neg.

Name	UID	Name	UID		
Basic Greyscale Print Mgt.	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
Basic Greyscale Print Mgt.	1.2.840.10008.5.1.1.9	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Basic Greyscale Print Mgt.	1.2.840.10008.5.1.1.9	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
Print Job	1.2.840.10008.5.1.1.14	DICOM Implicit VR Little Endian	1.2.840.10008.1.2.	SCP	None
Print Job	1.2.840.10008.5.1.1.14	DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
Print Job	1.2.840.10008.5.1.1.14	DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None

2.4.3.2.2.1   SOP Specific Conformance to Basic Greyscale Print Management Meta SOP Class

Print-Server provides standard conformance as an SCP to the DICOM V3.0 Basic Greyscale Print Management Meta SOP Class, UID=1.2.840.10008.5.1.1.9, which consists of the following Classes:

- Basic Film Session, UID=1.2.840.10008.5.1.1.1.

- Basic Film Box, UID=1.2.840.10008.5.1.1.2.

- Basic Greyscale Image Box, UID=1.2.840.10008.5.1.1.4.

- Printer, UID=1.2.840.10008.5.1.1.16.

The Specific Conformance Statement for each of these SOP Classes is described in the subsequent sections.

2.4.3.2.2.2   SOP Specific Conformance to Basic Film Session SOP Class

Print-Server provides standard conformance to the DICOM V3.0 Basic Film Session SOP Class, UID=1.2.840.10008.5.1.1.1, as an SCP.

N-CREATE - is sent by the SCU to create a Basic Film Session instance before the Basic Film Boxes are created.

1.   *Supported Attributes:*

2.   **Number of Copies -** (2000,0010). Supported values are: 1 to 99. Default value is:1.

3.   **Print Priority** - (2000,0020). Supported values are: LOW, MEDIUM and HIGH. Default value is: LOW. Prioritization is supported by **Print-Server** regardless of the actual printer capabilities.

4.   **Medium Type** - (2000,0030). Supported and default value is the one supported by the printer.

5.   **Film Destination** - (2000,0040). Supported and default value is the one supported by the printer.

6.   **Film Session Label** - (2000,0050). Any value is accepted but has no effect on the actual printing.

7.   **Memory Allocation** - (2000,0060). Any value is accepted but has no effect on the actual printing.

8.   If **Print-Server** returns one of the following status codes, it means that the N-CREATE has been unsuccessful.

9.   **0106** - Failure. Invalid attribute value. A list of invalid values is included in the response.

10.   **0210** - Failure. The previous film session has not been deleted.

11.   **B600** - Warning. Memory allocation is not supported.

N-SET -   is used to update any attribute of the Basic Film Session instance subject to the limitations mentioned for N-CREATE.

1.   If **Print-Server** returns one of the following status codes, it means that the N-SET has been unsuccessful:

2.   **0106** - Failure. Invalid attribute value. A list of invalid values is included in the response.

3.   **0210** - Failure. No such object instance: the Film Session SOP Instance UID given is not in use.

4.   **B600** - Warning. Memory allocation is not supported.

5.   **C610** -Failure. Film Session has not been created.

N-DELETE - is used to delete all information describing the Basic Film Session.

A status code **0112** is returned when the Film Session SOP Instance UID given is not in use, which results in a failure.

N-ACTION - is used to print a Film Session. The Film Boxes are printed in the order they were created. A Print Job SOP Instance is also created by the N-ACTION operation of the Film Session SOP Class.

1.   If **Print-Server** returns one of the following status codes, it means that the
      N-ACTION has been unsuccessful:

2.   **0112** - Failure. No such object instance: the Film Session SOP Instance UID given
      is   not in use.

3.   **0211** - Failure. Unrecognized operation: the action type name is not PRINT.

4.   **0213** -Failure. Resource limitation.

5.   **B602** - Warning. Film session contains an empty film.

6.   **C600** - Failure. Film Session SOP instance hierarchy does not contain Film Box
      SOP   Instances.

7.   **C610** - Failure. Film Session has not been created.

2.4.3.2.2.3   SOP Specific Conformance to Basic Film Box SOP Class

Print-Server provides standard conformance to the DICOM V3.0 Basic Film Box SOP Class,
UID=1.2.840.10008.5.1.1.2, as an SCP.

N-CREATE - is sent by the SCU to create a Basic Film Box once a Film Session has been successfully
          created. The Basic Film Box contains the presentation parameters common for all images on
          a given sheet of film.

1.   The 'SLIDE' 'SUPERSLIDE' and 'CUSTOM' Image Display Format attribute (2010,0010)
          values are not supported. All other attributes are supported according to the actual printer
          capabilities. Default values are also taken from the printer capabilities configuration file.

2.   If **Print-Server** returns one of the following status codes, it means that the
      N-CREATE was unsuccessful.

3.   **0106** - Failure. Invalid attribute value. A list of invalid values is included in the
              response.

4.   **0111**- Failure. Film Box UID given is already in use.

5.   **0112** - Failure. No such object instance: the Film Session SOP Instance UID given
      is   not in use.

6.   **0120** - Failure. Mandatory attributes are missing. A list of missing tags is included
              in the response.

7.   **C610**- Failure. Film Session has not been created.

N-SET -   is used to update the Basic Film Box instance. Any Film Box in the current Film Session
          may be updated.

1.   If **Print-Server** returns one of the following status codes, it means that the N-SET has been
          unsuccessful:

2.   **0106** - Failure. Invalid attribute value. A list of invalid values is included in the response.

3.   **0112** - Failure. No such object instance: the Film Session SOP Instance UID given is not in use.

4.   **C600** - Failure. Film Session SOP Instance hierarchy does not contain Film Box
SOP   Instances.

5.   **C610** -Failure. Film Session has not been created.

N-DELETE - is used to delete the Basic Film Box. Any Film Box in the current Film Session may be deleted.

1.   If **Print-Server** returns one of the following status codes, it means that the N-DELETE was unsuccessful:

2.   **0112** - Failure. No such object instance: the Film Session SOP Instance UID given is not in use.

3.   **C600** - Failure. Film Session SOP instance hierarchy does not contain Film Box SOP Instances.

N-ACTION - is used to print one or more copies of a single film of the Film Box. A Print Job SOP Instance is also created by the N-ACTION operation of the Film Box SOP Class.

1.   If **Print-Server** returns one of the following status codes, it means that the N-ACTION has been unsuccessful:

2.   **0112** - Failure. No such object instance: the Film Session SOP Instance UID given is not in use.

3.   **0211** - Failure. Unrecognized operation: the action type name is not PRINT.

4.   **0213** - Failure. Resource limitation.

5.   **B603** - Failure. Film Box is empty.

6.   **C600** - Failure. Film Session SOP instance hierarchy does not contain Film Box
SOP   Instances.

7.   **C610** - Failure. Film Session has not been created.

2.4.3.2.2.4   SOP Specific Conformance to Basic Greyscale Image Box SOP Class

Print-Server provides standard conformance to the DICOM V3.0 Basic Greyscale Image Box SOP Class, UID=1.2.840.10008.5.1.1.4, as an SCP.

The Basic Greyscale Image Box contains the presentation parameters and image pixel data which applies to a single image of a sheet of film. The N-SET DIMSE service is used to update the Basic Greyscale Image Box instance. Any Greyscale Image Box in the current Film Box may be updated. If **Print-Server** returns one of the following status codes, it means that the N-SET has been unsuccessful:

1. **0106** - Failure. Invalid attribute value. A list of invalid values is included in the response.

2. **0112** - Failure. No such object instance: the Film Session SOP Instance UID given is not in use.

3. **0120** - Failure. Mandatory attributes are missing. A list of missing tags is included in the response.

4. **0213** - Failure. Resource limitation.

5. **C600** - Failure. Film Session SOP instance hierarchy does not contain Film Box
   SOP   Instances.

6. **C610** - Failure. Film Session has not been created.

2.4.3.2.2.5 SOP Specific Conformance to Printer SOP Class

Print-Server provides standard conformance to the DICOM V3.0 Printer SOP Class, UID=1.2.840.10008.5.1.1.16, as an SCP.

The Printer SOP Class is implemented using the N-EVENT-REPORT and N-GET DIMSE services. N-EVENT-REPORT is used to report the changes of the printer status to the SCU in an asynchronous way. If **Print-Server** returns one of the following status codes, it means that the
N-GET has been unsuccessful:

1. **0117** - Failure. Invalid printer instance UID.

2. **0110** - Failure. Processing failure - Can't read Printer Info File.

2.4.3.2.2.6 SOP Specific Conformance to Printer Job SOP Class

Print-Server provides standard conformance to the DICOM V3.0 Print Job SOP Class, UID=1.2.840.10008.5.1.1.14, as an SCP.

The Print Job SOP Class is created by a N-ACTION of the Film Session SOP Class or a
N-ACTION of the Film Box SOP Class. After the films are printed or after a failure, the Print Job Instance is deleted.

The number of print jobs is limited only by the system resources (mainly disk space).

The Print Job SOP Class is implemented using the N-EVENT-REPORT and N-GET DIMSE services. N-EVENT-REis used to report execution status changes to the SCU in an asynchronous way. If **Print-Server** returns one of the following status codes, it means that the
N-GET has been unsuccessful:

1. **0112** - Failure. No such object instance: the Film Session SOP Instance UID given is not in use.

2.4.3.2.3 Presentation Context Acceptance Criterion

1. **Print-Server** will accept any Presentation Context from Table 2.13.

2.4.3.2.4   Transfer Syntax Selection Policies

Print-Server prefers an explicit Transfer Syntax encoding. If offered a choice of Transfer Syntax's in a Presentation Context, it will apply the following priorities to the choice of Transfer Syntax:

1.   DICOM Explicit VR Big Endian.

2.   DICOM Explicit VR Little Endian.

3.   DICOM Implicit VR Little Endian (Default).

2.5   Archive-Manager Specifications

Archive-Manager provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

SOP Class Name	SOP Class UID
Study Root Q/R Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1

2.5.1   Association Establishment Policies

2.5.1.1   General

The maximum PDU size which the **Archive-Manager** will use is configurable, with a minimum of 2K byte.

2.5.1.2   Number of Associations

Archive-Manager can have multiple simultaneous connections. The maximal number of simultaneous associations which will be initiated by **Archive-Manager** is limited by the configuration of the workstation. **Archive-Manager** will not initiate more than one association per each AE configured as an SCP in *SeleCT series.*

2.5.1.3   Asynchronous Nature

Archive-Manager will only allow a single outstanding operation on an association. Therefore **Archive-Manager** will not perform asynchronous operations window negotiation.

2.5.1.4   Implementation Identifying Information

Archive-Manager provides a single Implementation Class UID which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.5.2   Association Initiation by Real-World Activity

2.5.2.1   User Clicks on a Device Icon

2.5.2.1.1 Associated Real World Activity

Archive-Manager initiates an association when the user clicks on one of the icons in the devices tool-bar.

2.5.2.1.2 Proposed Presentation Contexts

All the Presentation Contexts shown in Table 2.14 are proposed by **Archive-Manager**.

Table 2.14: Proposed Presentation Contexts for Archive-Manager

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Study Root FIND	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.5.2.1.2.1   SOP Specific Conformance Statement for Study Root FIND

Archive-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCU for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID = 1.2.840.10008.5.1.4.1.2.2.1.

2.5.3   Association Acceptance Policy

Archive-Manager never accepts an association.

2.6   Memory-Manager Specifications

Memory-Manager provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

2.6.1 Association Establishment Policies

2.6.1.1 General

The maximum PDU size which the **Memory-Manager** will use is configurable, with a minimum of 2K byte.

2.6.1.2 Number of Associations

Memory-Manager can have multiple simultaneous connections. The maximal number of simultaneous associations which will be initiated by **Memory-Manager** is limited by the configuration of the workstation. **Memory-Manager** will not initiate more than one association per each AE configured as an SCP in *SeleCT series.*

2.6.1.3 Asynchronous Nature

Memory-Manager will only allow a single outstanding operation on an association. Therefore **Memory-Manager** will not perform asynchronous operations window negotiation.

2.6.1.4 Implementation Identifying Information

Memory-Manager provides a single Implementation Class UID which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.6.2 Association Initiation by Real-World Activity

2.6.2.1 Application Asks for Image Loading

2.6.2.1.1 Associated Real World Activity

Memory-Manager initiates an association when an image processing application asks for image loading from a specified source device using a proprietary IPC protocol.

2.6.2.1.2 Proposed Presentation Contexts

All the Presentation Contexts shown in Table 2.15 are proposed by **Memory-Manager**.

Table 2.15: Proposed Presentation Contexts for Archive-Manager

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Study Root MOVE	1.2.840.10008.5.1.4.1.2.2.1	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.6.2.1.2.1 SOP Specific Conformance Statement for Study Root MOVE

Memory-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCU for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID=1.2.840.10008.5.1.4.1.2.2.2.

2.6.3 Association Acceptance Policy

Memory-Manager never accepts an association.

2.7   Queue-Manager Specifications

Queue-Manager provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Study Root Q/R Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

2.7.1   Association Establishment Policies

2.7.1.1   General

The maximum PDU size which the **Queue-Manager** will use is configurable, with a minimum of 2K byte.

2.7.1.2   Number of Associations

Queue-Manager can have multiple simultaneous connections. The maximal number of simultaneous associations which will be initiated by **Queue-Manager** is limited by the configuration of the workstation. **Queue-Manager** will not initiate more than one association per each AE configured as an SCP in *SeleCT series.*

2.7.1.3   Asynchronous Nature

Queue-Manager will only allow a single outstanding operation on an association. Therefore **Queue-Manager** will not perform asynchronous operations window negotiation.

2.7.1.4   Implementation Identifying Information

Queue-Manager provides a single Implementation Class UID which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.7.2   Association Initiation by Real-World Activity

2.7.2.1   Application Asks for Image Transfer

2.7.2.1.1 Associated Real World Activity

Queue-Manager initiates an association when an image processing application (such as the **Archive-Manager** or the **Memory-Manager**) asks for image loading from a specified source device to a specified target device. This is done by a special Inter Process Communication Protocol of the system.

If **Queue-Manager** fails to move all the required images, it waits for some configurable duration and then retry to initiate the association.

2.7.2.1.2 Proposed Presentation Contexts

All the Presentation Contexts shown in Table 2.16 are proposed by **Queue-Manager**:

Table 2.16: Proposed Presentation Contexts for Queue-Manager

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Study Root MOVE	1.2.840.10008.5.1.4.1.2.2.2	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.7.2.1.2.1   SOP Specific Conformance Statement for Study Root MOVE

Queue-Manager provides standard conformance to the DICOM V3.0 Query/Retrieve Service Class as an SCU for the following SOP Class: Study Root Query/Retrieve Information Model - FIND, UID=1.2.840.10008.5.1.4.1.2.2.2.

2.7.3 Association Acceptance Policy

Queue-Manager never accepts an association.

2.8   Print-Manager Specifications

Print-Manager provides Standard Conformance to the following DICOM V3.0 Meta SOP Classes and DICOM V3.0 SOP as an SCU:

SOP Class Name	SOP Class UID
Basic Greyscale Print Manager	1.2.840.10008.5.1.1.9
Basic Color Print Management	1.2.840.10008.5.1.1.18
Print Job	1.2.840.10008.5.1.4.1.1.14

2.8.1 Association Establishment Policies

2.8.1.1   General

The maximum PDU size which the **Print-Manager** will use is configurable, with a minimum of 2K byte.

2.8.1.2   Number of Associations

Print-Manager can have only one open connection at a given time.

2.8.1.3   Asynchronous Nature

Print-Manager will only allow a single outstanding operation on an association. Therefore **Print-Manager** will not perform asynchronous operations window negotiation.

2.8.1.4   ImplementatioIdentifying Information

Print-Manager provides a single Implementation Class UID which is 1.2.840.113704.7.0.2. The Application Context Name is 1.2.840.10008.3.1.1.1.

2.8.2   Association Initiation by Real-World Activity

2.8.2.1   User Selects a Printer

2.8.2.1.1 Associated Real World Activity

Print-Manager initiates an association when the user selects a new printer or when the film previewer is initialized. In case of printer selection, the previous association is closed.

2.8.2.1.2 Proposed Presentation Contexts

All the Presentation Contexts shown in Table 2.17 are proposed by **Print-Manager**.

Table 2.17 Proposed Presentation Contexts for Print-Manager

Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Basic Greyscale Print Mgt.	1.2.840.10008.5.1.1.9	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		
Basic Color Print Mgt.	1.2.840.10008.5.1.1.8	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		

Print Job	1.2.840.10008.5.1.1.14	DICOM Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		DICOM Explicit VR Little Endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big Endian	1.2.840.10008.1.2.2		

2.8.2.1.2.1 SOP Specific Conformance Statement for Basic Greyscale Print Management Meta SOP Class

Print-Manager provides standard conformance as an SCU to the DICOM V3.0 Basic Greyscale Print Management Meta SOP Class, UID=1.2.840.10008.5.1.1.9, which consists of the following SOP Classes:

- Basic Film Session, UID=1.2.840.10008.5.1.1.1.

- Basic Film Box, UID=1.2.840.10008.5.1.1.2.

- Basic Greyscale Image Box, UID=1.2.840.10008.5.1.1.4.

- Printer, UID=1.2.840.10008.5.1.1.16.

2.8.2.1.2.2 SOP Specific Conformance Statement for Basic Color Print Management Meta SOP Class

Print-Manager provides standard conformance as an SCU to the DICOM V3.0 Basic Color Print Management Meta SOP Class, UID=1.2.840.10008.5.1.1.18, which consists of the following SOP Classes:

- Basic Film Session, UID=1.2.840.10008.5.1.1.1.

- Basic Film Box, UID=1.2.840.10008.5.1.1.2.

- Basic ColorImage Box, UID=1.2.840.10008.5.1.1.4.1.

- Printer, UID=1.2.840.10008.5.1.1.16.

2.8.2.1.2.3 SOP Specific Conformance Statement for Print Job SOP Class

Print-Manager provides standard conformance as an SCU to the DICOM V3.0 Print Job SOP Class, UID=1.2.840.10008.5.1.1.14.

2.8.3 Association Acceptance Policy

Print-Manager never accepts an association.

3 Communication Profiles

3.1   Supported Communications Stacks (Parts 8,9)

SeleCT series provides DICOM v3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

3.2   TCP/IP Stack

All the Application Entities in *SeleCT series* inherit their TCP/IP stack from the UNIX system upon which they operate.

3.2.1 Physical Media Support

SeleCT series is indifferent to the physical medium over which TCP/IP operates.

4 Extensions, Specializations, Privatizations of SOP Classes and Transfer Syntaxes

Not applicable

5 Configuration

5.1　　AE Title/Presentation Address Mapping

This mapping is defined during the *SeleCT* installation procedure.

5.2　　Configurable Parameters

- Maximum PDU size.

- Time-out.

6 Support of Extended Character Sets

No Extended Character Set is supported.