



# DicomImageViewer

## Dicom Conformance Statement

Software version: 2006/10/22 Maintenance Release

Document version: 2006/10/22

## 1. DICOM Conformance Statement Overview

The application supports display of DICOM images and spectroscopy objects obtained over the network, from interchange media, or from PS 3.10 files loaded from the local file system.

The application supports querying a remote system for a list of DICOM objects that may then be retrieved to the local system. It also supports sending locally loaded images across the network to another system, and responds to queries and retrieval requests from other systems.

All storage SOP Classes defined as of DICOM 2006 can be received, stored and transmitted by the application, but only images and spectroscopy objects may be loaded and viewed. All single and multiframe with grayscale and RGB color and palette color images may be displayed.

Only hierarchical query and retrieval is supported.

**Table 1-1  
Network Services**

<b>SOP Classes</b>	<b>User of Service (SCU)</b>	<b>Provider of Service (SCP)</b>
<b><i>Instance Transfer</i></b>		
Computed Radiography Image Storage	Yes	Stored only
Digital X-Ray Image Storage - For Presentation	Yes	Stored and Viewed
Digital X-Ray Image Storage - For Processing	Yes	Stored and Viewed
Digital Mammography X-Ray Image Storage - For Presentation	Yes	Stored and Viewed
Digital Mammography X-Ray Image Storage - For Processing	Yes	Stored and Viewed
Digital Intra-oral X-Ray Image Storage - For Presentation	Yes	Stored and Viewed
Digital Intra-oral X-Ray Image Storage - For Processing	Yes	Stored and Viewed
CT Image Storage	Yes	Stored and Viewed
Enhanced CT Image Storage	Yes	Stored and Viewed
Enhanced CT Image Storage	Yes	Stored and Viewed
Ultrasound Multiframe Image Storage - Retired	Yes	Stored and Viewed
Ultrasound Multiframe Image Storage - Retired	Yes	Stored and Viewed
Ultrasound Multiframe Image Storage	Yes	Stored and Viewed

MR Image Storage	Yes	Stored and Viewed
Enhanced MR Image Storage	Yes	Stored and Viewed
Enhanced MR Image Storage	Yes	Stored and Viewed
Nuclear Medicine Image Storage - Retired	Yes	Stored and Viewed
Ultrasound Image Storage - Retired	Yes	Stored and Viewed
Ultrasound Image Storage - Retired	Yes	Stored and Viewed
Ultrasound Image Storage	Yes	Stored and Viewed
Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe Single Bit Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe Grayscale Byte Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe Grayscale Word Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe True Color Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe Single Bit Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe Grayscale Byte Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe Grayscale Word Secondary Capture Image Storage	Yes	Stored and Viewed
Multiframe True Color Secondary Capture Image Storage	Yes	Stored and Viewed
Xray Angiographic Image Storage	Yes	Stored and Viewed
Enhanced XA Image Storage	Yes	Stored and Viewed
Xray RadioFluoroscopic Image Storage	Yes	Stored and Viewed
Enhanced XRF Image Storage	Yes	Stored and Viewed
Xray Angiographic Biplane Image Storage	Yes	Stored and Viewed
Nuclear Medicine Image	Yes	Stored and Viewed

Storage - Retired		
Nuclear Medicine Image Storage	Yes	Stored and Viewed
Visible Light Draft Image Storage	Yes	Stored and Viewed
Visible Light Multi-frame Draft Image Storage	Yes	Stored and Viewed
Visible Light Endoscopic Image Storage	Yes	Stored and Viewed
Video Endoscopic Image Storage	Yes	Stored and Viewed
Visible Light Microscopic Image Storage	Yes	Stored and Viewed
Video Microscopic Image Storage	Yes	Stored and Viewed
Visible Light Slide Coordinates Microscopic Image Storage	Yes	Stored and Viewed
Visible Light Photographic Image Storage	Yes	Stored and Viewed
Video Photographic Image Storage	Yes	Stored and Viewed
Ophthalmic Photography 8 Bit Image Storage	Yes	Stored and Viewed
Ophthalmic Photography 16 Bit Image Storage	Yes	Stored and Viewed
Positron Emission Tomography Image Storage	Yes	Stored and Viewed
RT Image Storage	Yes	Stored and Viewed
Ophthalmic Photography 8 Bit Image Storage	Yes	Stored and Viewed
Ophthalmic Photography 16 Bit Image Storage	Yes	Stored and Viewed
Basic Text SR Storage	Yes	Stored only
Enhanced SR Storage	Yes	Stored only
Comprehensive SR Storage	Yes	Stored only
Comprehensive SR Storage Trial	Yes	Stored only
Mammography CAD SR Storage	Yes	Stored only
Chest CAD SR Storage	Yes	Stored only
Procedure Log Storage	Yes	Stored only
X-Ray Radiation Dose Storage	Yes	Stored only
Key Object Selection	Yes	Stored only

Document Storage		
Grayscale Softcopy Presentation State Storage	Yes	Stored only
Color Softcopy Presentation State Storage	Yes	Stored only
Pseudo-Color Softcopy Presentation State Storage	Yes	Stored only
Blending Softcopy Presentation State Storage	Yes	Stored only
Twelve Lead ECG Storage	Yes	Stored only
General ECG Storage	Yes	Stored only
Ambulatory ECG Storage	Yes	Stored only
Hemodynamic Waveform Storage	Yes	Stored only
Cardiac Electrophysiology Waveform Storage	Yes	Stored only
Basic Voice Storage	Yes	Stored only
Standalone Overlay Storage	Yes	Stored only
Standalone Curve Storage	Yes	Stored only
Standalone Modality LUT Storage	Yes	Stored only
Standalone VOI LUT Storage	Yes	Stored only
Standalone PET Curve Storage	Yes	Stored only
RT Dose Storage	Yes	Stored only
RT Structure Set Storage	Yes	Stored only
RT Beams Treatment Record Storage	Yes	Stored only
RT Ion Beams Treatment Record Storage	Yes	Stored only
RT Plan Storage	Yes	Stored only
RT Ion Plan Storage	Yes	Stored only
RT Brachy Treatment Record Storage	Yes	Stored only
RT Treatment Summary Record Storage	Yes	Stored only
MR Spectroscopy Storage	Yes	Stored and Viewed
Raw Data Storage	Yes	Stored only
Spatial Registration Storage	Yes	Stored only
Spatial Fiducials Storage	Yes	Stored only
Stereometric Relationships	Yes	Stored only
Real World Value Mapping	Yes	Stored only

Storage		
Encapsulated PDF Storage	Yes	Stored only
<b>Query/Retrieve</b>		
Study Root Information Model FIND	Yes – Hierarchical only	Yes – Hierarchical only
Study Root Information Model MOVE	Yes – Hierarchical only	Yes – Hierarchical only
Study Root Information Model GET	No	Yes – Hierarchical only

**Table 1-2  
Media Services**

<b>Media Storage Application Profile</b>	<b>Write Files (FSC or FSU)</b>	<b>Read Files (FSR)</b>
<b>Compact Disk - Recordable</b>		
General Purpose CD-R	No	Yes
<b>DVD</b>		
General Purpose DVD-RAM	No	Yes

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## **3 Introduction**

### **3.1 REVISION HISTORY**

This conformance statement describes the features of the DicomImageViewer application for the NEMA Committee for the Advancement of DICOM sponsored Enhanced CT and MR demonstration project.

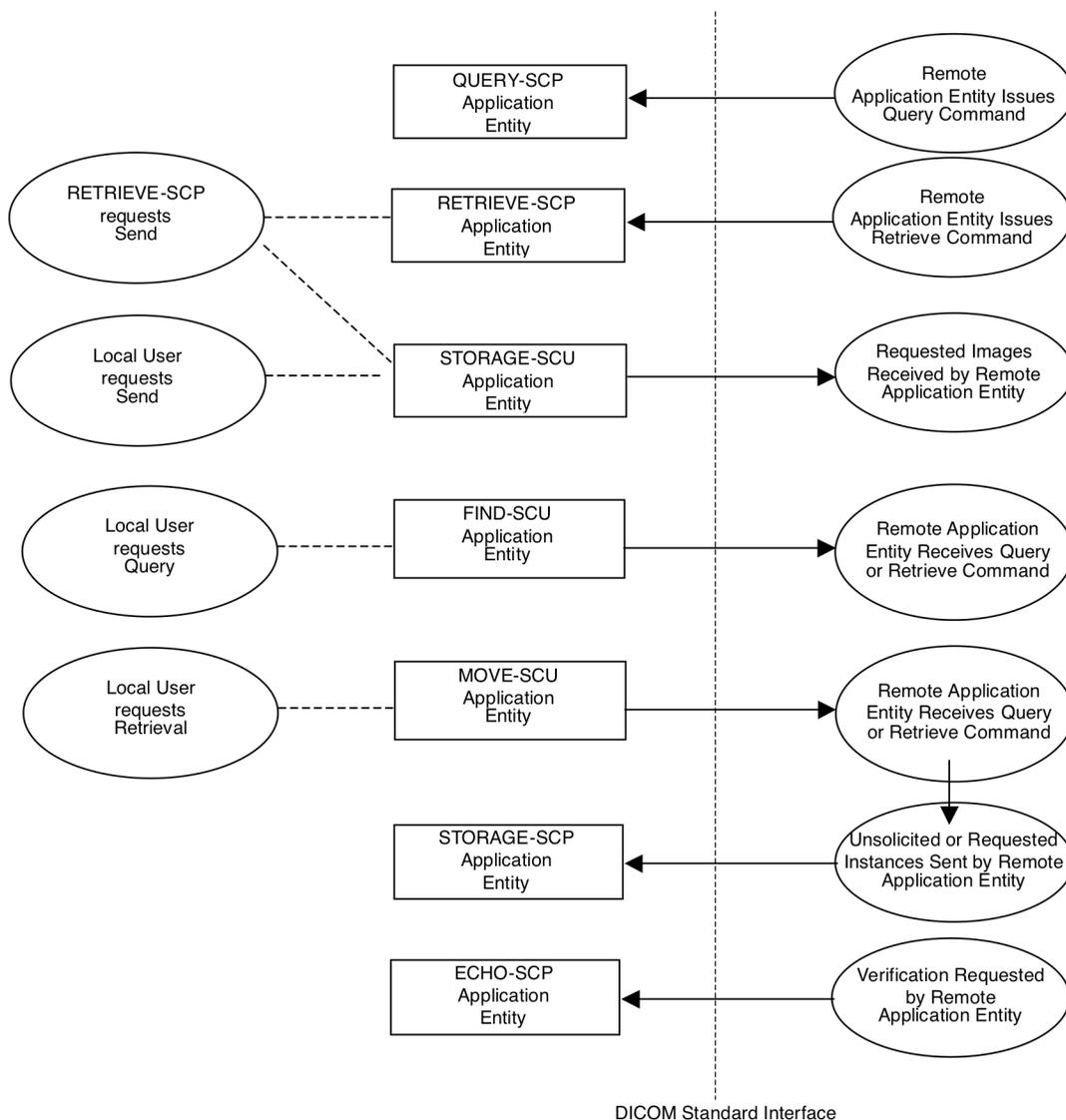
### **3.2 REMARKS**

This application is supplied for demonstration purposes only and has not been tested or approved for clinical or commercial use.

## 4 Networking

### 4.1 IMPLEMENTATION MODEL

#### 4.1.1 Application Data Flow



**Figure 4.1.1-1. Implementation Model**

The application is a single pure Java application that provides both a user interface, internal database and network listener that spawns additional threads as necessary to handle incoming connections, as well as media support.

Conceptually the network services may be modeled as the following separate AEs, though in fact all the AEs share a single (configurable) AE Title:

- ECHO-SCP, which responds to verification requests

- STORAGE-SCP, which receives incoming images and other composite instances
- STORAGE-SCU, which sends outbound images and other composite instances
- FIND-SCU, which queries remote AEs for lists of studies, series and instances
- MOVE-SCU, which retrieves selected studies, series or instances
- QUERY- SCP, which responds to queries from remote AEs for lists of studies, series and instances
- RETRIEVE- SCP, which responds to retrieval requests from remote AEs for lists of studies, series and instances

#### **4.1.2 Functional Definitions of AE's**

##### **4.1.2.1 ECHO-SCP**

ECHO-SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Class of the Verification Service Class, and will respond successfully to echo requests.

##### **4.1.2.2 STORAGE-SCP**

STORAGE-SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Storage Service Class, and will store the received instances to the local database where they may subsequently be listed and viewed through the user interface.

##### **4.1.2.3 STORAGE-SCU**

STORAGE-SCU is activated through the user interface when a user selects instances from the local database or a DICOMDIR, or the currently displayed instance, and requests that they be sent to a remote AE (selected from a pre-configured list). The STORAGE-SCU is also activated by retrieval requests made to RETRIEVE-SCP.

##### **4.1.2.4 FIND-SCU**

FIND-SCU is activated through the user interface when a user selects a remote AE to query (from a pre-configured list), then initiates a query. Queries are performed recursively from the study through the series and instance levels until all matching instances have been listed to the level required by the user's actions.

##### **4.1.2.5 MOVE-SCU**

MOVE-SCU is activated through the user interface when a user selects a study, series or instance for retrieval. A connection to the remote AE is established to initiate and monitor the retrieval and the STORAGE-SCP AE receives the retrieved instances.

##### **4.1.2.6 QUERY-SCP**

QUERY -SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Query Service Class, and will respond to queries at each level of the supported information models.

##### **4.1.2.7 RETRIEVE-SCP**

RETRIEVE -SCP waits in the background for connections, will accept associations with Presentation Contexts for SOP Classes of the Retrieve Service Class (both Get and Move), and will respond to retrieval requests at each level of the supported information models, and sends the appropriate composite instances using the services of the STORAGE-SCU, as well as the appropriate pending and completion status messages.

### 4.1.3 Sequencing of Real-World Activities

All SCP activities are performed asynchronously in the background and not dependent on any sequencing.

All SCU activities are sequentially initiated in the user interface, and another activity may not be initiated until the prior activity has completed.

## 4.2 AE SPECIFICATIONS

### 4.2.1 ECHO-SCP

#### 4.2.1.1 SOP Classes

ECHO-SCP provide Standard Conformance to the following SOP Class(es):

**Table 4.2.1.1-1  
SOP Classes supported by ECHO-SCP**

SOP Class Name	SOP Class UID
Verification SOP Class	1.2.840.10008.1.1

#### 4.2.1.2 Association Policies

##### 4.2.1.2.1 General

ECHO-SCP accepts but never initiates associations.

**Table 4.2.1.2.1-1  
Maximum PDU size received as a SCP for ECHO-SCP**

Maximum PDU size received	Unlimited
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##### 4.2.1.2.2 Number of Associations

**Table 4.2.1.2.2-1  
Number of Associations as a SCP for ECHO-SCP**

Maximum number of simultaneous associations	Unlimited
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##### 4.2.1.2.3 Asynchronous Nature

ECHO-SCP will only allow a single outstanding operation on an Association. Therefore, ECHO-SCP will not perform asynchronous operations window negotiation.

##### 4.2.1.2.4 Implementation Identifying Information

**Table 4.2.1.2.4-1  
DICOM Implementation Class and Version for ECHO-SCP**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

#### 4.2.1.3 Association Initiation Policy

ECHO-SCP does not initiate associations.

#### 4.2.1.4 Association Acceptance Policy

When ECHO-SCP accepts an association, it will respond to echo requests. If the Called AE Title does not match the pre-configured AE Title shared by all the SCPs of the application, the association will be rejected.

##### 4.2.1.4.1 Activity – Receive Echo Request

###### 4.2.1.4.1.1 Description and Sequencing of Activities

###### 4.2.1.4.1.2 Accepted Presentation Contexts

**Table 4.2.1.4.1.2-1  
Acceptable Presentation Contexts for ECHO-SCP and Receive Echo Request**

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

###### 4.2.1.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

###### 4.2.1.4.1.3 SOP Specific Conformance

###### 4.2.1.4.1.3.1 SOP Specific Conformance to Verification SOP Class

ECHO-SCP provides standard conformance to the Verification Service Class.

###### 4.2.1.4.1.3.2 Presentation Context Acceptance Criterion

ECHO-SCP will always accept any Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported, whether or not it is the same as another Presentation Context.

###### 4.2.1.4.1.3.3 Transfer Syntax Selection Policies

ECHO-SCP prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- a) first encountered explicit Transfer Syntax,
- b) default Transfer Syntax.

ECHO-SCP will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting a Transfer Syntax for each.

#### 4.2.2 STORAGE-SCP

##### 4.2.2.1 SOP Classes

STORAGE-SCP provides Standard Conformance to the following SOP Class(es):

**Table 4.2.2.1-1  
SOP Classes supported by STORAGE-SCP**

<b>SOP Class Name</b>	<b>SOP Class UID</b>
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
Ultrasound Multiframe Image Storage - Retired	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multiframe Image Storage - Retired	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Nuclear Medicine Image Storage - Retired	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage - Retired	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage - Retired	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1

Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Xray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Enhanced XA Image Storage	1.2.840.10008.5.1.4.1.1.12.1.1
Xray RadioFlourosopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Enhanced XRF Image Storage	1.2.840.10008.5.1.4.1.1.12.2.1
Xray Angiographic Biplane Image Storage	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage - Retired	1.2.840.10008.5.1.4.1.1.5
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Visible Light Draft Image Storage	1.2.840.10008.5.1.4.1.1.77.1
Visible Light Multi-frame Draft Image Storage	1.2.840.10008.5.1.4.1.1.77.2
Visible Light Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1
Visible Light Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1
Visible Light Slide Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Visible Light Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1
Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Comprehensive SR Storage Trial	1.2.840.10008.5.1.4.1.1.88.4
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50
Chest CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.65

Procedure Log Storage	1.2.840.10008.5.1.4.1.1.88.40
X-Ray Radiation Dose SR Storage	1.2.840.10008.5.1.4.1.1.88.67
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.2
Pseudo-Color Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.3
Blending Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.4
Twelve Lead ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Storage	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4
RT Ion Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.9
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Ion Plan Storage	1.2.840.10008.5.1.4.1.1.481.8
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1
Spatial Fiducials Storage	1.2.840.10008.5.1.4.1.1.66.2
Stereometric Relationship Storage	1.2.840.10008.5.1.4.1.1.77.1.5.3
Real World Value Mapping Storage	1.2.840.10008.5.1.4.1.1.67
Encapsulated PDF Storage	1.2.840.10008.5.1.4.1.1.104.1

## 4.2.2.2 Association Policies

### 4.2.2.2.1 General

STORAGE-SCP accepts but never initiates associations.

**Table 4.2.2.2.1-1  
Maximum PDU size received as a SCP for STORAGE-SCP**

Maximum PDU size received	Unlimited
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### 4.2.2.2.2 Number of Associations

**Table 4.2.2.2.2-1  
Number of Associations as a SCP for STORAGE-SCP**

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

### 4.2.2.2.3 Asynchronous Nature

STORAGE-SCP will only allow a single outstanding operation on an Association. Therefore, STORAGE-SCP will not perform asynchronous operations window negotiation.

### 4.2.2.2.4 Implementation Identifying Information

**Table 4.2.2.2.4-1  
DICOM Implementation Class and Version for STORAGE-SCP**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

## 4.2.2.3 Association Initiation Policy

STORAGE-SCP does not initiate associations.

## 4.2.2.4 Association Acceptance Policy

When STORAGE-SCP accepts an association, it will respond to storage requests. If the Called AE Title does not match the pre-configured AE Title shared by all the SCPs of the application, the association will be rejected.

### 4.2.2.4.1 Activity – Receive Storage Request

#### 4.2.2.4.1.1 Description and Sequencing of Activities

As instances are received they are copied to the local file system and a record inserted into the local database. If the received instance is a duplicate of a previously received instance, the old file and database record will be overwritten with the new one.

#### 4.2.2.4.1.2 Accepted Presentation Contexts

**Table 4.2.2.4.1.2-1  
Acceptable Presentation Contexts for STORAGE-SCP and Receive Storage Request**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4.2.2.1-1.	See Table 4.2.2.1-1.	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little	1.2.840.10008.1.2.1	SCP	None

		Endian			
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.9	SCP	None
		PixelMed Bzip2 Explicit VR Little Endian	1.3.6.1.4.1.5962.300.1	SCP	None

#### 4.2.2.4.1.2.1 Extended Negotiation

No extended negotiation is performed, though STORAGE-SCP:

- is a Level 2 Storage SCP (Full – does not discard any data elements, including private elements)
- does not support digital signatures
- does not coerce any received data elements

#### 4.2.2.4.1.3 SOP Specific Conformance

##### 4.2.2.4.1.3.1 SOP Specific Conformance to Storage SOP Classes

STORAGE-SCP provides standard conformance to the Storage Service Class.

##### 4.2.2.4.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCP will always accept any Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported, whether or not it is the same as another Presentation Context.

##### 4.2.2.4.1.3.3 Transfer Syntax Selection Policies

STORAGE-SCP prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- a) compressed Transfer Syntaxes (bzip2 preferred over deflate),
- b) explicit VR little endian Transfer Syntax,
- c) first encountered explicit Transfer Syntax,
- d) default Transfer Syntax.

STORAGE-SCP will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting a Transfer Syntax for each.

##### 4.2.2.4.1.3.4 Response Status

STORAGE-SCP will behave as described in Table 4.2.2.4.1.3.4-1 when generating the C-STORE response command message.

**Table 4.2.2.4.1.3.4-1  
Response Status for STORAGE-SCP and Receive Storage Request**

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Refused	Out of Resources	A7xx	(0000,0902)	Never sent

Error	Data Set does not match SOP Class	A9xx	(0000,0901) (0000,0902)	Never sent – data set is not checked prior to storage
	Cannot understand	Cxxx	(0000,0901) (0000,0902)	Never sent
Warning	Coercion of Data Elements	B000	(0000,0901) (0000,0902)	Never sent - no coercion is ever performed
	Data Set does not match SOP Class	B007	(0000,0901) (0000,0902)	Never sent - data set is not checked prior to storage
	Elements Discarded	B006	(0000,0901) (0000,0902)	Never sent – all elements are always stored
Success		0000	None	

### 4.2.3 STORAGE-SCU

#### 4.2.3.1 SOP Classes

STORAGE-SCU provide Standard Conformance to the following SOP Class(es):

**Table 4.2.3.1-1  
SOP Classes supported by STORAGE-SCU**

SOP Class Name	SOP Class UID
Computed Radiography Image Storage	1.2.840.10008.5.1.4.1.1.1
Digital X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
Digital X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
Digital Mammography X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.2
Digital Mammography X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.2.1
Digital Intra-oral X-Ray Image Storage - For Presentation	1.2.840.10008.5.1.4.1.1.1.3
Digital Intra-oral X-Ray Image Storage - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1
CT Image Storage	1.2.840.10008.5.1.4.1.1.2
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
Enhanced CT Image Storage	1.2.840.10008.5.1.4.1.1.2.1
Ultrasound Multiframe Image Storage - Retired	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multiframe Image Storage - Retired	1.2.840.10008.5.1.4.1.1.3
Ultrasound Multiframe Image Storage	1.2.840.10008.5.1.4.1.1.3.1
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1
Enhanced MR Image Storage	1.2.840.10008.5.1.4.1.1.4.1

Nuclear Medicine Image Storage - Retired	1.2.840.10008.5.1.4.1.1.5
Ultrasound Image Storage - Retired	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage - Retired	1.2.840.10008.5.1.4.1.1.6
Ultrasound Image Storage	1.2.840.10008.5.1.4.1.1.6.1
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Multiframe Single Bit Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.1
Multiframe Grayscale Byte Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.2
Multiframe Grayscale Word Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.3
Multiframe True Color Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7.4
Xray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1
Xray RadioFlourosopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2
Xray Angiographic Biplane Image Storage	1.2.840.10008.5.1.4.1.1.12.3
Nuclear Medicine Image Storage - Retired	1.2.840.10008.5.1.4.1.1.5
Nuclear Medicine Image Storage	1.2.840.10008.5.1.4.1.1.20
Visible Light Draft Image Storage	1.2.840.10008.5.1.4.1.1.77.1
Visible Light Multi-frame Draft Image Storage	1.2.840.10008.5.1.4.1.1.77.2
Visible Light Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1
Video Endoscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.1.1
Visible Light Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2
Video Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.2.1
Visible Light Slide Coordinates Microscopic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.3
Visible Light Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4
Video Photographic Image Storage	1.2.840.10008.5.1.4.1.1.77.1.4.1
Positron Emission Tomography Image Storage	1.2.840.10008.5.1.4.1.1.128
RT Image Storage	1.2.840.10008.5.1.4.1.1.481.1
Ophthalmic Photography 8 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.1

Ophthalmic Photography 16 Bit Image Storage	1.2.840.10008.5.1.4.1.1.77.1.5.2
Basic Text SR Storage	1.2.840.10008.5.1.4.1.1.88.11
Enhanced SR Storage	1.2.840.10008.5.1.4.1.1.88.22
Comprehensive SR Storage	1.2.840.10008.5.1.4.1.1.88.33
Comprehensive SR Storage Trial	1.2.840.10008.5.1.4.1.1.88.4
Mammography CAD SR Storage	1.2.840.10008.5.1.4.1.1.88.50
Key Object Selection Document Storage	1.2.840.10008.5.1.4.1.1.88.59
Grayscale Softcopy Presentation State Storage	1.2.840.10008.5.1.4.1.1.11.1
Twelve Lead ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.1
General ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.2
Ambulatory ECG Storage	1.2.840.10008.5.1.4.1.1.9.1.3
Hemodynamic Waveform Storage	1.2.840.10008.5.1.4.1.1.9.2.1
Cardiac Electrophysiology Waveform Storage	1.2.840.10008.5.1.4.1.1.9.3.1
Basic Voice Storage	1.2.840.10008.5.1.4.1.1.9.4.1
Standalone Overlay Storage	1.2.840.10008.5.1.4.1.1.8
Standalone Curve Storage	1.2.840.10008.5.1.4.1.1.9
Standalone Modality LUT Storage	1.2.840.10008.5.1.4.1.1.10
Standalone VOI LUT Storage	1.2.840.10008.5.1.4.1.1.11
Standalone PET Curve Storage	1.2.840.10008.5.1.4.1.1.129
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3
RT Beams Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.4
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5
RT Brachy Treatment Record Storage	1.2.840.10008.5.1.4.1.1.481.6
RT Treatment Summary Record Storage	1.2.840.10008.5.1.4.1.1.481.7
MR Spectroscopy Storage	1.2.840.10008.5.1.4.1.1.4.2
Raw Data Storage	1.2.840.10008.5.1.4.1.1.66

#### 4.2.3.2 Association Policies

##### 4.2.3.2.1 General

STORAGE-SCU initiates but never accepts associations.

**Table 4.2.3.2.1-1  
Maximum PDU size received as a SCU for STORAGE-SCU**

Maximum PDU size received	Unlimited
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#### 4.2.3.2.2 Number of Associations

**Table 4.2.3.2.2-1  
Number of Associations as a SCU for STORAGE-SCU**

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

#### 4.2.3.2.3 Asynchronous Nature

STORAGE-SCU will only allow a single outstanding operation on an Association. Therefore, STORAGE-SCU will not perform asynchronous operations window negotiation.

#### 4.2.3.2.4 Implementation Identifying Information

**Table 4.2.3.2.4-1  
DICOM Implementation Class and Version for STORAGE-SCU**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

#### 4.2.3.3 Association Initiation Policy

STORAGE-SCU attempts to initiate a new association for each instance it attempts to transfer.

##### 4.2.3.3.1 Activity – Send Storage Request

###### 4.2.3.3.1.1 Description and Sequencing of Activities

For each instance selected from the user interface to be transferred, a single attempt will be made to transmit it to the selected remote AE. If the send fails, for whatever reason, no retry will be performed, and an attempt will be made to send the next instance.

###### 4.2.3.3.1.2 Proposed Presentation Contexts

**Table 4.2.3.3.1.2-1  
Proposed Presentation Contexts for STORAGE-SCU and Receive Storage Request**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
<i>See Table 4.2.3.1-1.</i>	<i>See Table 4.2.3.1-1.</i>	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.9	SCU	None
		PixelMed Bzip2 Explicit VR Little Endian	1.3.6.1.4.1.5962.300.1	SCU	None
<i>See Table 4.2.3.1-1.</i>	<i>See Table 4.2.3.1-1.</i>	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
<i>See Table 4.2.3.1-1.</i>	<i>See Table 4.2.3.1-1.</i>	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
<i>See Table</i>	<i>See Table 4.2.3.1-1.</i>	Explicit VR Big	1.2.840.10008.1.2.2	SCU	None

4.2.3.1-1.		Endian			
See Table 4.2.3.1-1.	See Table 4.2.3.1-1.	Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.9 9	SCU	None
See Table 4.2.3.1-1.	See Table 4.2.3.1-1.	PixelMed Bzip2 Explicit VR Little Endian	1.3.6.1.4.1.5962.300. 1	SCU	None

STORAGE-SCU will propose Presentation Contexts only for the SOP Class of the instance that is to be transferred.

For that SOP Class, STORAGE-SCU will propose multiple Presentation Contexts, one for each of the supported Transfer Syntaxes, and an additional Presentation Context with all of the supported Transfer Syntaxes, in order to determine which Transfer Syntaxes the remote SCP supports, and which it prefers.

#### 4.2.3.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

#### 4.2.3.3.1.3 SOP Specific Conformance

##### 4.2.3.3.1.3.1 SOP Specific Conformance to Storage SOP Classes

STORAGE-SCU provides standard conformance to the Storage Service Class.

##### 4.2.3.3.1.3.2 Presentation Context Acceptance Criterion

STORAGE-SCU does not accept associations.

##### 4.2.3.3.1.3.3 Transfer Syntax Selection Policies

STORAGE-SCU prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in the accepted Presentation Contexts, it will apply the following priority to the choice of Presentation Context to use for the C-STORE operation:

- a) compressed Transfer Syntaxes (bzip2 preferred over deflate),
- b) explicit VR little endian Transfer Syntax,
- c) first encountered explicit Transfer Syntax,
- d) default Transfer Syntax.

##### 4.2.3.3.1.3.4 Response Status

STORAGE-SCU will behave as described in Table 4.2.3.3.1.3.4-1 in response to the status returned in the C-STORE response command message.

**Table 4.2.3.3.1.3.4-1  
Response Status for STORAGE-SCU and Receive Storage Request**

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Refused	Out of Resources	A7xx	(0000,0902)	Ignored
Error	Data Set does not match SOP Class	A9xx	(0000,0901) (0000,0902)	Ignored
	Cannot understand	Cxxx	(0000,0901) (0000,0902)	Ignored
Warning	Coercion of Data Elements	B000	(0000,0901) (0000,0902)	Ignored

	Data Set does not match SOP Class	B007	(0000,0901) (0000,0902)	Ignored
	Elements Discarded	B006	(0000,0901) (0000,0902)	Ignored
Success		0000	None	Ignored

#### 4.2.3.4 Association Acceptance Policy

STORAGE-SCU does not accept associations.

#### 4.2.4 FIND-SCU

##### 4.2.4.1 SOP Classes

FIND-SCU provide Standard Conformance to the following SOP Class(es):

**Table 4.2.4.1-1  
SOP Classes supported by FIND-SCU**

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model – FIND	1.2.840.10008.5.1.4.1.2.2.1

##### 4.2.4.2 Association Policies

###### 4.2.4.2.1 General

FIND-SCU initiates but never accepts associations.

**Table 4.2.4.2.1-1  
Maximum PDU size received as a SCU for FIND-SCU**

Maximum PDU size received	Unlimited
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###### 4.2.4.2.2 Number of Associations

**Table 4.2.4.2.2-1  
Number of Associations as a SCU for FIND-SCU**

Maximum number of simultaneous associations	1
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###### 4.2.4.2.3 Asynchronous Nature

FIND-SCU will only allow a single outstanding operation on an Association. Therefore, FIND-SCU will not perform asynchronous operations window negotiation.

###### 4.2.4.2.4 Implementation Identifying Information

**Table 4.2.4.2.4-1  
DICOM Implementation Class and Version for FIND-SCU**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

#### 4.2.4.3 Association Initiation Policy

FIND-SCU attempts to initiate a new association when the user performs the query action from the user interface. If this involves recursive queries for lower query levels in the hierarchy, these will be performed on the same association.

#### 4.2.4.3.1 Activity – Query Remote AE

##### 4.2.4.3.1.1 Description and Sequencing of Activities

A single attempt will be made to query the remote AE. If the query fails, for whatever reason, no retry will be performed.

##### 4.2.4.3.1.2 Proposed Presentation Contexts

**Table 4.2.4.3.1.2-1  
Proposed Presentation Contexts for FIND-SCU and Query Remote AE**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
<i>See Table 4.2.4.1-1.</i>	<i>See Table 4.2.4.1-1.</i>	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
<i>See Table 4.2.4.1-1.</i>	<i>See Table 4.2.4.1-1.</i>	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
<i>See Table 4.2.4.1-1.</i>	<i>See Table 4.2.4.1-1.</i>	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
<i>See Table 4.2.4.1-1.</i>	<i>See Table 4.2.4.1-1.</i>	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

FIND-SCU will propose multiple Presentation Contexts, one for each of the supported Transfer Syntaxes, and an additional Presentation Context with all of the supported Transfer Syntaxes, in order to determine which Transfer Syntaxes the remote SCP supports, and which it prefers.

##### 4.2.4.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

In particular, relational queries are not supported.

##### 4.2.4.3.1.3 SOP Specific Conformance

##### 4.2.4.3.1.3.1 SOP Specific Conformance to C-FIND SOP Classes

FIND-SCU provides standard conformance to the supported C-FIND SOP Classes.

Only a single information model, Study Root, is supported.

All queries are initiated at the highest level of the information model (the STUDY level), and then for each response received, recursively repeated at the next lower levels (the SERIES and then IMAGE levels), in order to completely elucidate the “tree” of instances available on the remote AE (from which the user may subsequently request a retrieval at any level).

No CANCEL requests are ever issued.

Unexpected attributes returned in a C-FIND response (those not requested) are listed in the browser at the appropriate level if present in the dictionary. Requested return attributes not returned by the SCP are ignored. Non-matching responses returned by the SCP due to unsupported (hopefully optional) matching keys are not filtered locally by the FIND-SCU and thus will still be presented in the browser. No attempt is made to filter out duplicate responses.

Specific Character Set will always be included at every query level. If present in the response, Specific Character Set will be used to identify character sets other than the default character set for display of strings in the browser.

**Table 4.2.4.3.1.3.1-1  
Study Root Request Identifier for FIND-SCU**

<b>Name</b>	<b>Tag</b>	<b>Unique, Matching or Return Key</b>
<b><i>STUDY level</i></b>		
Patient's ID	(0010,0020)	R
Patient's Name	(0010,0010)	R
Patient's Birth Date	(0010,0030)	R
Patient's Sex	(0010,0040)	R
Patient's Birth Time	(0010,0032)	R
Other Patient's ID's	(0010,1000)	R
Other Patient's Names	(0010,1001)	R
Ethnic Group	(0010,2160)	R
Patient Comments	(0010,4000)	R
Study ID	(0020,0010)	R
Study Description	(0008,1030)	R
Modalities In Study	(0008,0061)	R
Study Date	(0008,0020)	R
Study Time	(0008,0030)	R
Referring Physician's Name	(0008,0090)	R
Accession Number	(0008,0050)	R
Physician of Record	(0008,1048)	R
Name of Physician(s) Reading Study	(0008,1060)	R
Admitting Diagnoses Description	(0008,1080)	R
Patient's Age	(0010,1010)	R
Patient's Size	(0010,1020)	R
Patient's Weight	(0010,1030)	R
Occupation	(0010,2180)	R
Additional Patient History	(0010,21B0)	R
Study Instance UID	(0020,000D)	U

<b><i>SERIES level</i></b>		
Series Number	(0020,0011)	R
Series Description	(0008,103E)	R
Modality	(0008,0060)	R
Series Date	(0008,0021)	R
Series Time	(0008,0031)	R
Performing Physician's Name	(0008,1050)	R
Protocol Name	(0018,1030)	R
Operator's Name	(0008,1070)	R
Laterality	(0020,0060)	R
Body Part Examined	(0018,0015)	R
Manufacturer	(0008,0070)	R
Manufacturer's Model Name	(0008,1090)	R
Station Name	(0008,1010)	R
Institution Name	(0008,0080)	R
Institutional Department Name	(0008,1040)	R
Series Instance UID	(0020,000E)	U
<b><i>IMAGE level</i></b>		
Instance Number	(0020,0013)	R
Image Comments	(0020,4000)	R
Content Date	(0008,0023)	R
Content Time	(0008,0033)	R
Image Type	(0008,0008)	R
Acquisition Number	(0020,0012)	R
Acquisition Date	(0008,0022)	R
Acquisition Time	(0008,0032)	R
Acquisition Date Time	(0008,002a)	R
Derivation Description	(0008,2111)	R
Contrast/Bolus Agent	(0018,0010)	R
Quality Control Image	(0028,0300)	R
Burned In Annotation	(0028,0301)	R
Lossy Image Compression	(0028,2110)	R
Lossy Image Compression Ratio	(0028,2112)	R
Lossy Image Compression Method	(0028,2114)	R
Number of Frames	(0028,0008)	R
SOP Instance UID	(0008,0018)	U
SOP Class UID	(0008,0016)	R
<b><i>Common to all query levels</i></b>		

Specific Character Set	(0008,0005)	R
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#### 4.2.4.3.1.3.2 Presentation Context Acceptance Criterion

FIND-SCU does not accept associations.

#### 4.2.4.3.1.3.3 Transfer Syntax Selection Policies

FIND-SCU prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in the accepted Presentation Contexts, it will apply the following priority to the choice of Presentation Context to use for the C-STORE operation:

- a) first encountered explicit Transfer Syntax,
- b) default Transfer Syntax.

#### 4.2.4.3.1.3.4 Response Status

FIND-SCU will behave as described in Table 4.2.4.3.1.3.4-1 in response to the status returned in the C-FIND response command message(s).

**Table 4.2.4.3.1.3.4-1  
Response Status for FIND-SCU and Query Remote AE Request**

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Refused	Out of Resources	A700	(0000,0902)	Current query is terminated; remaining queries continue
Error	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	Current query is terminated; remaining queries continue
	Unable to process	Cxxx	(0000,0901) (0000,0902)	Current query is terminated; remaining queries continue
Cancel	Matching terminated due to Cancel request	FE00	None	Ignored (should never occur, since cancels never issued)
Success	Matching is complete - No final Identifier is supplied	0000	None	Current query is terminated; remaining queries continue
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier	Identifier used to populate browser and trigger recursive lower level queries
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or	FF01	Identifier	Identifier used to populate browser and trigger recursive lower level queries

	matching for this Identifier			
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#### 4.2.4.4 Association Acceptance Policy

FIND-SCU does not accept associations.

#### 4.2.5 MOVE-SCU

##### 4.2.5.1 SOP Classes

MOVE-SCU provide Standard Conformance to the following SOP Class(es):

**Table 4.2.5.1-1  
SOP Classes supported by MOVE-SCU**

SOP Class Name	SOP Class UID
Study Root Query/Retrieve Information Model – MOVE	1.2.840.10008.5.1.4.1.2.2.2

##### 4.2.5.2 Association Policies

###### 4.2.5.2.1 General

MOVE-SCU initiates but never accepts associations.

**Table 4.2.5.2.1-1  
Maximum PDU size received as a SCU for MOVE-SCU**

Maximum PDU size received	Unlimited
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###### 4.2.5.2.2 Number of Associations

**Table 4.2.5.2.2-1  
Number of Associations as a SCU for MOVE-SCU**

Maximum number of simultaneous associations	1
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###### 4.2.5.2.3 Asynchronous Nature

MOVE-SCU will only allow a single outstanding operation on an Association. Therefore, MOVE-SCU will not perform asynchronous operations window negotiation.

###### 4.2.5.2.4 Implementation Identifying Information

**Table 4.2.5.2.4-1  
DICOM Implementation Class and Version for MOVE-SCU**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

##### 4.2.5.3 Association Initiation Policy

MOVE-SCU attempts to initiate a new association when the user performs the retrieve action from the user interface.

#### 4.2.5.3.1 Activity – Retrieve From Remote AE

##### 4.2.5.3.1.1 Description and Sequencing of Activities

For the entity (study, series or instance) selected from the user interface to be retrieved, a single attempt will be made to retrieve it from the selected remote AE. If the retrieve fails, for whatever reason, no retry will be performed.

##### 4.2.5.3.1.2 Proposed Presentation Contexts

**Table 4.2.5.3.1.2-1  
Proposed Presentation Contexts for MOVE-SCU and Retrieve From Remote AE**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4.2.5.1-1.	See Table 4.2.5.1-1.	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
See Table 4.2.5.1-1.	See Table 4.2.5.1-1.	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
See Table 4.2.5.1-1.	See Table 4.2.5.1-1.	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
See Table 4.2.5.1-1.	See Table 4.2.5.1-1.	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None

MOVE-SCU will propose multiple Presentation Contexts, one for each of the supported Transfer Syntaxes, and an additional Presentation Context with all of the supported Transfer Syntaxes, in order to determine which Transfer Syntaxes the remote SCP supports, and which it prefers.

##### 4.2.5.3.1.2.1 Extended Negotiation

No extended negotiation is performed.

In particular, relational retrievals are not supported.

##### 4.2.5.3.1.3 SOP Specific Conformance

##### 4.2.5.3.1.3.1 SOP Specific Conformance to C-FIND SOP Classes

MOVE-SCU provides standard conformance to the supported C-MOVE SOP Classes.

Only a single information model, Study Root, is supported.

A retrieval will be performed at the STUDY, SERIES or IMAGE level depending on what level of entity has been selected by the user in the browser.

No CANCEL requests are ever issued.

The retrieval is performed from the AE that was specified in the Retrieve AE attribute returned from the query performed by FIND-SCU. The instances are retrieved to the current application's local database by specifying the destination as the AE Title of the STORE-SCP AE of the local application. This implies that the remote C-MOVE SCP must be preconfigured to determine the presentation address corresponding to the STORE-SCP AE. The STORE-SCP AE will accept storage requests addressed to it from anywhere,

so no pre-configuration of the local application to accept from the remote AE is necessary (except in so far as it was necessary to configure FIND-SCU).

**Table 4.2.5.3.1.3.1-1  
Study Root Request Identifier for MOVE-SCU**

Name	Tag	Unique, Matching or Return Key
<b><i>STUDY level</i></b>		
Study Instance UID	(0020,000D)	U
<b><i>SERIES level</i></b>		
Series Instance UID	(0020,000E)	U
<b><i>IMAGE level</i></b>		
SOP Instance UID	(0008,0018)	U

**4.2.5.3.1.3.2 Presentation Context Acceptance Criterion**

MOVE-SCU does not accept associations.

**4.2.5.3.1.3.3 Transfer Syntax Selection Policies**

MOVE-SCU prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in the accepted Presentation Contexts, it will apply the following priority to the choice of Presentation Context to use for the C-STORE operation:

- a) first encountered explicit Transfer Syntax,
- b) default Transfer Syntax.

**4.2.5.3.1.3.4 Response Status**

MOVE-SCU will behave as described in Table 4.2.5.3.1.3.4-1 in response to the status returned in the C-MOVE response command message(s).

**Table 4.2.5.3.1.3.4-1  
Response Status for MOVE-SCU and Retrieve From Remote AE Request**

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)	Retrieval is terminated
	Out of Resources - Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is terminated
	Move Destination unknown	A801	(0000,0902)	Retrieval is terminated
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	Retrieval is terminated
	Unable to process	Cxxx	(0000,0901) (0000,0902)	Retrieval is terminated

Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is terminated (should never occur, since cancels never issued)
Warning	Sub-operations Complete - One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)	Retrieval is terminated
Success	Sub-operations Complete - No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval is terminated
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Retrieval continues

#### 4.2.5.3.1.3.5 Sub-operation dependent behavior

Since the C-MOVE operation is dependent on completion of C-STORE sub-operations that are occurring on a separate association, the question of failure of operations on the other association(s) must be considered.

MOVE-SCU completely ignores whatever activities are taking place in relation to the STORAGE-SCP AE that is receiving the retrieved instances. Once the C-MOVE has been initiated it runs to completion (or failure) as described in the C-MOVE response command message(s). There is no attempt by MOVE-SCU to confirm that instances have actually been successfully received or locally stored.

Whether or not completely or partially successfully retrievals are made available in the local database to the user is purely dependent on the success or failure of the C-STORE sub-operations, not on any explicit action by MOVE-SCU.

Whether or not the remote AE attempts to retry any failed C-STORE sub-operations is beyond the control of MOVE-SCU.

If the association on which the C-MOVE was issued is aborted for any reason, whether or not the C-STORE sub-operations continue is dependent on the remote AE; the local STORAGE-SCP will continue to accept associations and storage operations regardless.

#### 4.2.5.4 Association Acceptance Policy

MOVE-SCU does not accept associations.

### 4.2.6 QUERY-SCP

#### 4.2.6.1 SOP Classes

QUERY-SCP provides Standard Conformance to the following SOP Class(es):

**Table 4.2.6.1-1  
SOP Classes supported by QUERY-SCP**

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

## 4.2.6.2 Association Policies

### 4.2.6.2.1 General

QUERY-SCP accepts but never initiates associations.

**Table 4.2.6.2.1-1  
Maximum PDU size received as a SCP for QUERY-SCP**

Maximum PDU size received	Unlimited
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### 4.2.6.2.2 Number of Associations

**Table 4.2.6.2.2-1  
Number of Associations as a SCP for QUERY-SCP**

Maximum number of simultaneous associations	Unlimited
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### 4.2.6.2.3 Asynchronous Nature

QUERY-SCP will only allow a single outstanding operation on an Association. Therefore, QUERY-SCP will not perform asynchronous operations window negotiation.

### 4.2.6.2.4 Implementation Identifying Information

**Table 4.2.6.2.4-1  
DICOM Implementation Class and Version for QUERY-SCP**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

### 4.2.6.3 Association Initiation Policy

QUERY-SCP does not initiate associations.

### 4.2.6.4 Association Acceptance Policy

When QUERY-SCP accepts an association, it will respond to query requests. If the Called AE Title does not match the pre-configured AE Title shared by all the SCPs of the application, the association will be rejected.

#### 4.2.6.4.1 Activity – Receive Query Request

##### 4.2.6.4.1.1 Description and Sequencing of Activities

As queries are received the identifiers appropriate to the specified query level are extracted and a query is performed on the local database, and appropriate responses (if any matches) are returned as pending status messages over the same association on which the query command was received, followed by a final response indicating that matching is complete.

##### 4.2.6.4.1.2 Accepted Presentation Contexts

**Table 4.2.6.4.1.2-1  
Acceptable Presentation Contexts for QUERY-SCP and Receive Query Request**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
See Table 4.2.6.1-1.	See Table 4.2.6.1-1.	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None

	Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
	Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
	Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.9	SCP	None
	PixelMed Bzip2 Explicit VR Little Endian	1.3.6.1.4.1.5962.300.1	SCP	None

#### 4.2.6.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

#### 4.2.6.4.1.3 SOP Specific Conformance

##### 4.2.6.4.1.3.1 SOP Specific Conformance to Query SOP Classes

QUERY-SCP provides standard conformance to the Query Service Class.

The QUERY-SCP supports hierarchical queries and not relational queries. Specifically, at information levels above the specified query level, the required keys must be present or matching will fail. If no values are specified for the matching keys at the top level, then all entities at that level in the database will be returned.

There are no attributes always returned by default. Only those attributes requested in the query identifier are returned.

Specific Character Set (0008,0005) in the request identifier is recognized for interpretation of the encoding of the values in the request, and is never matched, nor does it serve to influence the encoding of the response. Specific Character Set (0008,0005) may be returned in the response identifies if necessary to convey the encoding of values in the response.

##### 4.2.6.4.1.3.1.1 Study Root Information Model

All of the required levels (STUDY, SERIES, and IMAGE) are supported. All of the required matching keys on each of the three levels are supported, as well as the optional matching and return keys specified in Table 4.2.6.4.1.3.1.1-1.

**Table 4.2.6.4.1.3.1.1-1  
QUERY-SCP Study Root C-FIND Supported Elements**

Level	Attribute Name	Tag	Unique Matching Key	Types of Matching	Comment
STUDY/PATIENT	Patient's Name	(0010,0010)		S,*,U (2)	
STUDY/PATIENT	Patient's ID	(0010,0020)		S,*,U	
STUDY/PATIENT	Patient's Birth Date	(0010,0030)		S,R,U (1)	
STUDY/PATIENT	Patient's Birth Time	(0010,0032)		S,R,U (1)	
STUDY/PATIENT	Patient's Sex	(0010,0040)		S,*,U	
STUDY/PATIENT	Other Patient's ID's	(0010,1000)		S,*,U	
STUDY/PATIENT	Other Patient's Names	(0010,1001)		S,*,U (2)	
STUDY/PATIENT	Ethnic Group	(0010,2160)		S,*,U	

STUDY/PATIENT	Patient Comments	(0010,4000)		S,*,U	
STUDY	Study Date	(0008,0020)		S,R,U (1)	
STUDY	Study Time	(0008,0030)		S,R,U (1)	
STUDY	Accession Number	(0008,0050)		S,*,U	
STUDY	Modalities in Study	(0008,0061)		-	
STUDY	SOP Classes in Study	(0008,0062)		-	
STUDY	Referring Physician's Name	(0008,0090)		S,*,U (2)	
STUDY	Study Description	(0008,1030)		S,*,U	
STUDY	Physician of Record	(0008,1048)		S,*,U (2)	
STUDY	Name of Physician(s) Reading Study	(0008,1060)		S,*,U (2)	
STUDY	Admitting Diagnoses Description	(0008,1080)		S,*,U	
STUDY	Patient's Age	(0010,1010)		S,*,U	
STUDY	Patient's Size	(0010,1020)		S,*,U	
STUDY	Patient's Weight	(0010,1030)		S,*,U	
STUDY	Occupation	(0010,2180)		S,*,U	
STUDY	Additional Patient History	(0010,21B0)		S,*,U	
STUDY	Study Instance UID	(0020,000D)	Y	S,U,L	
STUDY	Study ID	(0020,0010)		S,*,U	
STUDY	Other Study Numbers	(0020,1070)		S,*,U	
STUDY	Interpretation Author	(4008,010C)		S,*,U (2)	
	Number of Study Related Series	(0020,1206)		-	
	Number of Study Related Instances	(0020,1208)		-	
SERIES	Series Date	(0008,0021)		S,R,U (1)	
SERIES	Series Time	(0008,0031)		S,R,U (1)	
SERIES	Modality	(0008,0060)		S,*,U	
SERIES	Conversion Type	(0008,0064)		S,*,U	
SERIES	Presentation Intent Type	(0008,0068)		S,*,U	
SERIES	Manufacturer	(0008,0070)		S,*,U	
SERIES	Institution Name	(0008,0080)		S,*,U	
SERIES	Series Description	(0008,103E)		S,*,U	
SERIES	Institutional Department Name	(0008,1040)		S,*,U	
SERIES	Performing Physician's Name	(0008,1050)		S,*,U (2)	
SERIES	Operator's Name	(0008,1070)		S,*,U (2)	
SERIES	Body Part Examined	(0018,0015)		S,*,U	

SERIES	Protocol Name	(0018,1030)		S,*,U	
SERIES	Series Instance UID	(0020,000E)	Y	S,U,L	
SERIES	Series Number	(0020,0011)		S,*,U	
SERIES	Frame of Reference UID	(0020,0052)		S,U,L	
SERIES	Laterality	(0020,0060)		S,*,U	
	Number of Series Related Instances	(0020,1209)		-	
SERIES	Performed Procedure Step Start Date	(0040,0244)		S,R,U (1)	
SERIES	Performed Procedure Step Start Time	(0040,0245)		S,R,U (1)	
SERIES	Performed Procedure Step ID	(0040,0253)		S,*,U	
INSTANCE	Transfer Syntax UID	(0002,0010)			
INSTANCE	Source Application Entity Title	(0002,0016)		S,*,U	
INSTANCE	Image Type	(0008,0008)		S,*,U	
INSTANCE	SOP Class UID	(0008,0016)		S,U,L	
INSTANCE	SOP Instance UID	(0008,0018)	Y	S,U,L	
INSTANCE	Content (formerly Image) Date	(0008,0023)		S,R,U (1)	
INSTANCE	Acquisition Date Time	(0008,002A)		S,R,U	
INSTANCE	Derivation Description	(0008,2111)		S,*,U	
INSTANCE	Pixel Presentation	(0008,9205)		S,*,U	
INSTANCE	Volumetric Properties	(0008,9206)		S,*,U	
INSTANCE	Volume Based Calculation Technique	(0008,9207)		S,*,U	
INSTANCE	Complex Image Component	(0008,9208)		S,*,U	
INSTANCE	Acquisition Contrast	(0008,9209)		S,*,U	
INSTANCE	Contrast/Bolus Agent	(0018,0010)		S,*,U	
INSTANCE	Pulse Sequence Name	(0018,9005)		S,*,U	
INSTANCE	Acquisition Number	(0020,0012)		S,*,U	
INSTANCE	Instance (formerly Image) Number	(0020,0013)		S,*,U	
INSTANCE	Image Position (Patient)	(0020,0032)		S,*,U	
INSTANCE	Image Orientation (Patient)	(0020,0037)		S,*,U	
INSTANCE	Image Laterality	(0020,0062)		S,*,U	
INSTANCE	Image Comments	(0020,4000)		S,*,U	
INSTANCE	In-concatenation Number	(0020,9162)		S,*,U	

INSTANCE	Concatenation UID	(0020,9161)			
INSTANCE	In-concatenation Total Number	(0020,9163)		S,*,U	
INSTANCE	Photometric Interpretation	(0028,0004)		S,*,U	
INSTANCE	Number of Frames	(0028,0008)		S,*,U	
INSTANCE	Rows	(0028,0010)		S,*,U	
INSTANCE	Columns	(0028,0011)		S,*,U	
INSTANCE	Bits Allocated	(0028,0100)		S,*,U	
INSTANCE	Bits Stored	(0028,0101)		S,*,U	
INSTANCE	Pixel Representation	(0028,0103)		S,*,U	
INSTANCE	Quality Control Image	(0028,0300)		S,*,U	
INSTANCE	Burned In Annotation	(0028,0301)		S,*,U	
INSTANCE	Window Center	(0028,1050)		S,*,U	
INSTANCE	Window Width	(0028,1051)		S,*,U	
INSTANCE	Lossy Image Compression	(0028,2110)		S,*,U	
INSTANCE	Lossy Image Compression Ratio	(0028,2112)		S,*,U	
INSTANCE	Lossy Image Compression Method	(0028,2114)		S,*,U	

All of the matching keys are also return keys. The types of matching supported by the C-FIND SCP are defined as follows. A "S" indicates that single value matching is supported, an "R" indicates that range matching is supported, an "\*" indicates that wildcard matching is supported, a 'U' indicates that universal matching is supported, and an 'L' indicates that list of UID matching is supported. No entry in the matching column indicates that no matching is supported for that attribute, but it will be returned if requested.

(1) Dates and times for corresponding entities when present in the request are matched together, as if they were a single attribute of DT value representation. For example, Study Date (0008,0020) "20050720-20050722" and Study Time (0008,0030) "100000-110000" match all studies from 10 am on 2005/07/20 until 11am on 2005/07/22, not all studies performed only between 10 am and 11 am on each of the three days.

(2) Person names are handled specially, and in the default configuration are not only case insensitive but also are matched phonetically by last and first name components (only) and swapped last and first name components, in order to provide a broader range of responses for likely matches in the face of variations in spelling and sequence of components of a patient's name.

#### 4.2.6.4.1.3.2 Presentation Context Acceptance Criterion

QUERY-SCP will always accept any Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported, whether or not it is the same as another Presentation Context.

#### 4.2.6.4.1.3.3 Transfer Syntax Selection Policies

QUERY-SCP prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- a) compressed Transfer Syntaxes (bzip2 preferred over deflate),
- b) explicit VR little endian Transfer Syntax,
- c) first encountered explicit Transfer Syntax,
- d) default Transfer Syntax.

QUERY-SCP will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting a Transfer Syntax for each.

#### 4.2.6.4.1.3.4 Response Status

QUERY-SCP will behave as described in Table 4.2.6.4.1.3.4-1 when generating the C-FIND response command message.

**Table 4.2.6.4.1.3.4-1  
Response Status for QUERY-SCP and Receive Query Request**

Service Status	Further Meaning	Status Codes	Related Fields	Behavior
Failure	Refused: Out of Resources	A700	(0000,0902)	Never sent
	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	Never sent
	Unable to process	Cxxx	(0000,0901) (0000,0902)	Never sent
Cancel	Matching terminated due to Cancel request	FE00	None	Never sent – cancel not supported
Success	Matching is complete – No final Identifier is supplied.	0000	None	
Pending	Matches are continuing – Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys.	FF00	Identifier	
	Matches are continuing – Warning that one or more Optional Keys were not supported for existence and/or matching for this Identifier.	FF01	Identifier	

## 4.2.7 RETRIEVE-SCP

### 4.2.7.1 SOP Classes

RETRIEVE-SCP provides Standard Conformance to the following SOP Class(es):

**Table 4.2.7.1-1**  
**SOP Classes supported by RETRIEVE-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
Study Root Q/R Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3

### 4.2.7.2 Association Policies

#### 4.2.7.2.1 General

RETRIEVE-SCP accepts associations but uses STORE-SCU to initiate associations for C-MOVE operations. The storage requests for C-GET operations are performed over the same association as the request C-GET request.

**Table 4.2.7.2.1-1**  
**Maximum PDU size received as a SCP for RETRIEVE-SCP**

Maximum PDU size received	Unlimited
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#### 4.2.7.2.2 Number of Associations

**Table 4.2.7.2.2-1**  
**Number of Associations as a SCP for RETRIEVE-SCP**

Maximum number of simultaneous associations	Unlimited
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#### 4.2.7.2.3 Asynchronous Nature

RETRIEVE-SCP will only allow a single outstanding operation on an Association. Therefore, RETRIEVE-SCP will not perform asynchronous operations window negotiation.

#### 4.2.7.2.4 Implementation Identifying Information

**Table 4.2.7.2.4-1**  
**DICOM Implementation Class and Version for RETRIEVE-SCP**

Implementation Class UID	1.3.6.1.4.1.5962.99.2
Implementation Version Name	PIXELMEDJAVA001

### 4.2.7.3 Association Initiation Policy

RETRIEVE-SCP uses STORE-SCU to initiate associations for C-MOVE operations. In such cases, STORE-SCU attempts to initiate a single new association to transfer all instances to be retrieved.

### 4.2.7.4 Association Acceptance Policy

When RETRIEVE-SCP accepts an association, it will respond to C-GET or C-MOVE retrieval requests. If the Called AE Title does not match the pre-configured AE Title shared by all the SCPs of the application, the association will be rejected.

#### 4.2.7.4.1 Activity – Receive Retrieve Request

##### 4.2.7.4.1.1 Description and Sequencing of Activities

As retrieve requests are received, the identifiers appropriate to the specified query level are extracted and a query is performed on the local database, and appropriate instances to retrieve are stored over a separate association in the case of a C-MOVE, or over the same association in the case of a C-GET. During retrieval and storage, a pending status message is issued for each instance over the same association on which the retrieve command was received, followed by a final response indicating that retrieval is complete.

For each instance to be transferred, a single attempt will be made to transmit it to the selected remote AE. If the send fails, for whatever reason, no retry will be performed, and an attempt will be made to send the next instance. If the remote AE closes the association, for whatever reason, no further retrievals will be performed and no attempt will be made to reopen another association to transfer the remaining instances.

##### 4.2.7.4.1.2 Accepted Presentation Contexts

**Table 4.2.7.4.1.2-1  
Acceptable Presentation Contexts for RETRIEVE-SCP and Receive Retrieve Request**

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name	UID		
<i>See Table 4.2.7.1-1.</i>	<i>See Table 4.2.7.1-1.</i>	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCP	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCP	None
		Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.9	SCP	None
		PixelMed Bzip2 Explicit VR Little Endian	1.3.6.1.4.1.5962.300.1	SCP	None
<i>See Table 4.2.3.1-1.</i>	<i>See Table 4.2.3.1-1.</i>	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2	SCU	None
		Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.9	SCU	None
		PixelMed Bzip2 Explicit VR Little Endian	1.3.6.1.4.1.5962.300.1	SCU	None

##### 4.2.7.4.1.2.1 Extended Negotiation

No extended negotiation is performed.

#### **4.2.7.4.1.3 SOP Specific Conformance**

##### **4.2.7.4.1.3.1 SOP Specific Conformance to Retrieve SOP Classes**

RETRIEVE-SCP provides standard conformance to the Retrieve Service Class.

The RETRIEVE-SCP supports hierarchical retrieval and not relational retrieval. Specifically, at information levels above the specified query level, the required keys must be present or matching will fail.

List of UID matching is not supported at any retrieval level.

Storage requests (whether C-GET or C-MOVE) will be attempted for every SOP Instance matched. If the C-STORE attempt fails, either because there is no suitable Presentation Context on the same Association (for a C-GET) or on the separate Association (for a C-MOVE), or because a C-STORE request returns a failure status, requests will continue with the remaining SOP Instances matched.

##### **4.2.7.4.1.3.1.1 Study Root Information Model**

All of the required levels (STUDY, SERIES, and IMAGE) are supported.

##### **4.2.7.4.1.3.2 Presentation Context Acceptance Criterion**

RETRIEVE-SCP will always accept any Presentation Context for the supported SOP Classes with the supported Transfer Syntaxes. More than one proposed Presentation Context will be accepted for the same Abstract Syntax if the Transfer Syntax is supported, whether or not it is the same as another Presentation Context.

The RETRIEVE-SCP will accept the storage Presentation Contexts in order to act in the SCU role to perform C-STORE operations over the same Association in response to C-GET requests:

- the remote Association Initiator must propose during Association Establishment appropriate Abstract Syntaxes for the necessary Storage SOP Classes,
- the remote Association Initiator must propose SCU/SCP Role Negotiation Sub-items for each of the Storage SOP Classes specifying that the SCP Role supported,
- the RETRIEVE-SCP will confirm acceptance of all proposed SCU/SCP Role Negotiation Sub-items for which the Association Initiator indicates that the SCP Role is supported.

##### **4.2.7.4.1.3.3 Transfer Syntax Selection Policies**

RETRIEVE-SCP prefers explicit Transfer Syntaxes. If offered a choice of Transfer Syntaxes in a Presentation Context, it will apply the following priority to the choice of Transfer Syntax:

- a) compressed Transfer Syntaxes (bzip2 preferred over deflate),
- b) explicit VR little endian Transfer Syntax,
- c) first encountered explicit Transfer Syntax,
- d) default Transfer Syntax.

RETRIEVE-SCP will accept duplicate Presentation Contexts, that is, if it is offered multiple Presentation Contexts, each of which offers acceptable Transfer Syntaxes, it will accept all Presentation Contexts, applying the same priority for selecting a Transfer Syntax for each.

##### **4.2.7.4.1.3.4 Response Status**

RETRIEVE-SCP will behave as described in Table 4.2.7.4.1.3.4-1 when generating the C-MOVE or C-GET response command message.

**Table 4.2.7.4.1.3.4-1  
Response Status for RETRIEVE-SCP and Receive Retrieve Request**

<b>Service Status</b>	<b>Further Meaning</b>	<b>Status Codes</b>	<b>Related Fields</b>	<b>Behavior</b>
Failure	Refused: Out of Resources – Unable to calculate number of matches	A701	(0000,0902)	Never sent
	Refused: Out of Resources – Unable to perform sub-operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Never sent
	Refused: Move Destination unknown	A801	(0000,0902)	A single response with this Status Code is sent when a presentation address (IP address and port number) cannot be determined for the Move Destination AE Title in the request
	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)	A single response with this Status Code is sent when a valid database query cannot be constructed from the supplied identifier
	Unable to Process	C000	(0000,0901) (0000,0902)	A single response with this Status Code is sent when the database query derived from the supplied identifier failed for any reason
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	Never sent – cancel not supported
Warning	Sub-operations Complete – One or more Failures	B000	(0000,1020) (0000,1022) (0000,1023)	A final response with this Status Code is sent when not all of the Composite SOP Instances have been successfully sent.
Success	Sub-operations Complete – No Failures	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	A final response with this Status Code is sent when all the Composite SOP Instances have been successfully sent.
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)	A response with this Status Code is sent every time a Composite SOP Instance has been successfully sent, except for the last instance transferred.

### 4.3 PHYSICAL NETWORK INTERFACES

#### 4.3.1 Supported Communications Stacks

##### 4.3.1.1 TCP/IP Stack

The application inherits TCP/IP support from the underlying operating system.

### 4.3.2 Physical Network Interface

The application is indifferent to the physical medium over which TCP/IP executes; which is dependent on the underlying operating system and hardware.

### 4.3.3 Additional Protocols

When host names rather than IP addresses are used in the configuration properties to specify presentation addresses for remote AEs, the application is dependent on the name resolution mechanism of the underlying operating system.

## 4.4 CONFIGURATION

All configuration is performed through the use of Java properties file(s) stored in pre-defined locations that are specific to the underlying operating system. Refer to the Release Notes for specific details.

### 4.4.1 AE Title/Presentation Address Mapping

The Calling AE Title of the local application is configurable in the preferences file, and is shared by all of the AEs.

The mapping of the logical name by which remote AEs are described in the user interface to Called AE Titles as well as presentation address (hostname or IP address and port number) is configurable in the preferences file.

### 4.4.2 Parameters

**Table 4.4.2-1**  
**Configuration Parameters table**

<b>Parameter</b>	<b>Configurable</b>	<b>Default Value</b>
<b>General Parameters</b>		
PDU Size	No	16kB
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	No	None
General DIMSE level time-out values	No	None
Time-out waiting for response to TCP/IP connect() request. (Low-level timeout)	No	None
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	No	None
Time-out for waiting for data between TCP/IP packets. (Low-level timeout)	No	None
Time-out for waiting for Transport Connection Close Indication after Association Release Request, before closing Transport Connection locally (ARTIM)	No	5 seconds
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	None
<b>AE Specific Parameters (all AEs)</b>		
Size constraint in maximum object size	No	None
Maximum PDU size the AE can receive (see note 1)	No	Unlimited
Maximum PDU size the AE can send	No	Unlimited
AE specific DIMSE level time-out values	No	None
Number of simultaneous Associations by Service and/or	No	Unlimited

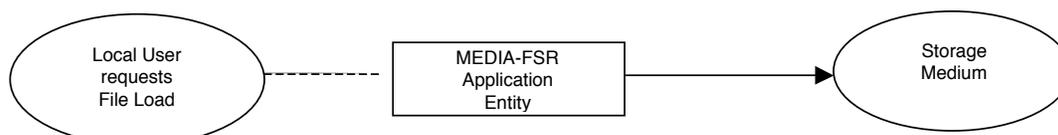
<b>Parameter</b>	<b>Configurable</b>	<b>Default Value</b>
<b>General Parameters</b>		
SOP Class		
SOP Class support	No	All supported SOP Classes always proposed and accepted
Transfer Syntax support	No	All supported Transfer Syntaxes always proposed and accepted
Other parameters that are configurable	No	None

Notes: 1. Though the application can support unlimited PDU sizes, it will never offer a Maximum Received PDU Length of zero (unlimited) since this triggers a bug in some older systems.

## 5 Media

### 5.1 IMPLEMENTATION MODEL

#### 5.1.1 Application Data Flow



**Figure 5.1.1-1. Implementation Model**

The application is a single pure Java application that provides a user interface, network support and media support as a File Set Reader.

Conceptually it may be modeled as the following single AE:

- MEDIA-FSR, which loads a user-selected PS 3.10 compliant file, which may be a DICOMDIR or an image or spectroscopy object, either from the local file system or from PS 3.12 compliant media according to one of the General Purpose Media Application Profiles of PS 3.11 (CD-R or DVD-RAM)

In effect, the application is media-neutral, since the user is required to browse and locate the DICOMDIR file. Furthermore, any DICOM image or spectroscopy object encoded in one of the standard uncompressed Transfer Syntaxes may be loaded, even in the absence of a PS 3.10 compliant meta-information header, in which case a “best guess” at the Transfer Syntax will be made.

Compressed Transfer Syntaxes are not supported, which limits the Media Application Profiles supported.

#### 5.1.2 Functional Definitions of AE's

##### 5.1.2.1 MEDIA-FSR

MEDIA-FSR is activated through the user interface to select directories, images and spectra for display, import into the local database or network transmission.

#### 5.1.3 Sequencing of Real-World Activities

All FSR activities are sequentially initiated in the user interface, and another activity may not be initiated until the prior activity has completed.

### 5.2 AE SPECIFICATIONS

#### 5.2.1 MEDIA-FSR

##### 5.2.1.1 Media Application Profiles

MEDIA-FSR provides standard conformance to DICOM Interchange Option of the Media Storage Service Class.

**Table 5.2.1.1-1  
Application Profiles, Activities, and Roles for MEDIA-FSR**

Application Profiles Supported	Real World Activity	Role	SC Option
STD-GEN-CD	Load directory or file	FSR	Interchange
STD-GEN-DVD-RAM	Load directory or file	FSR	Interchange

Note: The application is media neutral and dependent on the underlying hardware. Any (non-secure) General Purpose Profile can be supported.

#### **5.2.1.2 File Meta Information for the Application Entity**

Not applicable, since MEDIA-FSR is not an FSC or FSU.

#### **5.2.1.3 Activities**

##### **5.2.1.3.1 Activity – Load Directory or File**

MEDIA-FSR is activated through the user interface when a user selects the File load operation.

If the loaded file is a DICOMDIR, a browser will be displayed, from which instances may be selected and in turn loaded for display, imported into the local database or sent to a remote AE over the network.

If the file is an image or spectroscopy instance, it will be loaded and displayed.

##### **5.2.1.3.1.1 Application Profile Specific Conformance**

See Table 4.2.1.1-1. There are no extensions or specializations.

### **5.3 AUGMENTED AND PRIVATE PROFILES**

#### **5.3.1 Augmented Profiles**

None.

#### **5.3.2 Private Profiles**

None.

### **5.4 CONFIGURATION**

None.

## **6. Support of Extended Character Sets**

### **6.1 OVERVIEW**

The application supports all extended character sets defined in the DICOM 2002 standard, including single-byte and multi-byte character sets as well as code extension techniques using ISO 2022 escapes.

Support extends to correctly decoding and displaying the correct symbol for all names and strings found in the DICOMDIR, in storage instances from media and received over the network, and in the local database.

No specific support for sorting of strings other than in the default character set is provided in the browsers.

### **6.2 CHARACTER SETS**

In addition to the default character repertoire, the Defined Terms for Specific Character Set in Table 6.2-1 are supported:

**Table 6.2-1  
Supported Specific Character Set Defined Terms**

<b>Character Set Description</b>	<b>Defined Term</b>
Latin alphabet No. 1	ISO_IR 100
Latin alphabet No. 2	ISO_IR 101
Latin alphabet No. 3	ISO_IR 109
Latin alphabet No. 4	ISO_IR 110
Cyrillic	ISO_IR 144
Arabic	ISO_IR 127
Greek	ISO_IR 126
Hebrew	ISO_IR 138
Latin alphabet No. 5	ISO_IR 148
Unicode in UTF-8	ISO_IR 192
Japanese	ISO_IR 13
Thai	ISO_IR 166
Default repertoire	ISO 2022 IR 6
Latin alphabet No. 1	ISO 2022 IR 100
Latin alphabet No. 2	ISO 2022 IR 101
Latin alphabet No. 3	ISO 2022 IR 109
Latin alphabet No. 4	ISO 2022 IR 110
Cyrillic	ISO 2022 IR 144
Arabic	ISO 2022 IR 127
Greek	ISO 2022 IR 126
Hebrew	ISO 2022 IR 138
Latin alphabet No. 5	ISO 2022 IR 148
Japanese	ISO 2022 IR 13
Thai	ISO 2022 IR 166
Japanese	ISO 2022 IR 87
Japanese	ISO 2022 IR 159
Korean	ISO 2022 IR 149
Chinese	GB18030

### **6.3 CONFIGURATION**

Whether or not characters are displayed correctly depends on the presence of font support in the underlying operating system. Typically, as described in the Release Notes, it may be necessary for the user to add one of the “all Unicode” fonts to their system configuration in order to correctly display characters that would not typically be used in the default locale.

## **7. Security**

### **7.1 SECURITY PROFILES**

None supported.

### **7.2 ASSOCIATION LEVEL SECURITY**

None supported.

Any Calling AE Titles and/or IP addresses may open an Association.

### **7.3 APPLICATION LEVEL SECURITY**

None supported.

## **8. Annexes**

### **8.1 CREATED SOP INSTANCES**

None.

### **8.2 FIELDS FROM RECEIVED IOD USED BY APPLICATION**

No SOP Class specific fields are required.

The local database, remote query and directory browsers make use of the conventional identification attributes to distinguish patients, studies, series and instances. In particular, if two patients have the same value for Patient ID, they will be treated as the same in the browser and the local database.

### **8.3 ATTRIBUTE MAPPING**

Not applicable.

### **8.4 COERCED/MODIFIED FIELDS**

No coercion is performed.

### **8.5 DATA DICTIONARIES**

No private attributes are defined.

### **8.6 CONTROLLED TERMINOLOGY**

The value for Code Meaning will be displayed for all code sequences. No local lexicon is provided to look up alternative code meanings.

### **8.7 STANDARD EXTENDED/SPECIALIZED/PRIVATE SOPS**

None.

### **8.8 PRIVATE TRANSFER SYNTAXES**

#### **8.8.1 PixelMed Bzip2 Explicit VR Little Endian Transfer Syntax**

This Transfer Syntax follows the same rules as the standard Deflate Transfer Syntax, in that the entire data set is compressed, not just the Pixel data, except that instead of the deflate algorithm, the bzip2 algorithm is used.

This Transfer Syntax has a UID of "1.3.6.1.4.1.5962.300.1".